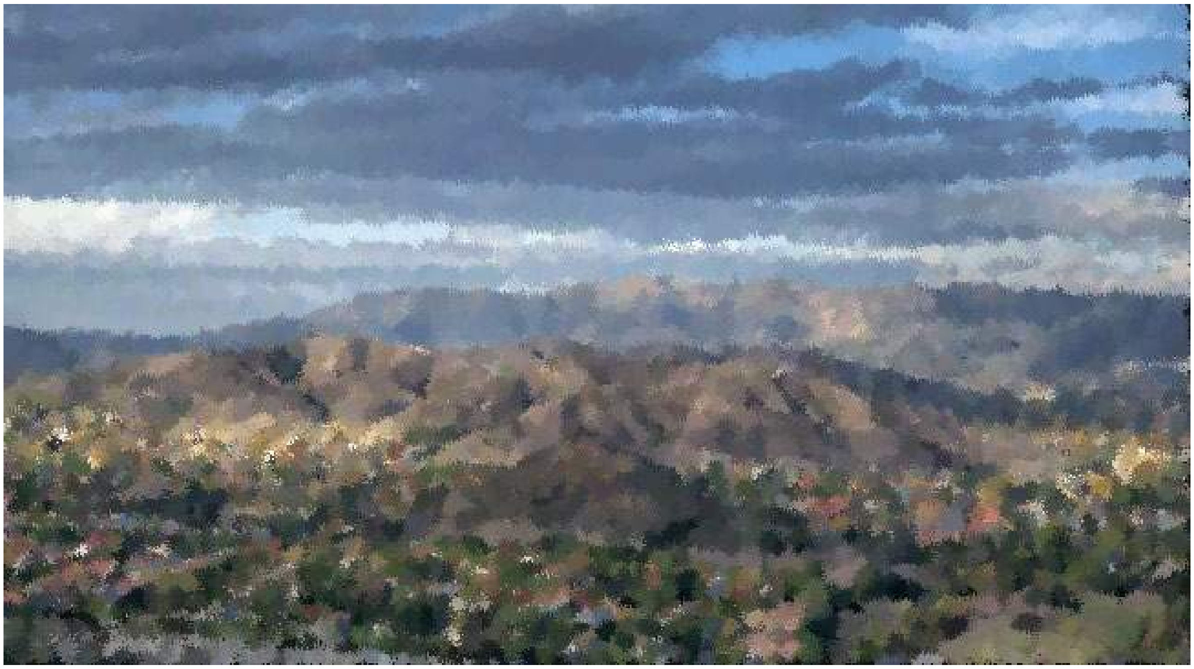

The Canopy

Draft Environmental Impact Report
SCH#2023070072

prepared by

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Executive Summary

This document is an Environmental Impact Report (EIR) analyzing the environmental effects of the proposed Canopy Project (proposed project). This section summarizes the characteristics of the proposed project, alternatives to the proposed project, and the environmental impacts and mitigation measures associated with the proposed project.

Project Synopsis

Project Applicant

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Project Description

This EIR has been prepared to examine the potential environmental effects of The Canopy Project. The following is a summary of the full project description, which can be found in Section 2, *Project Description*.

The project site is located at 1009-1011 Gravenstein Highway North, on the east side of Gravenstein Highway North southeast of its intersection with Mill Station Road, within the City of Sebastopol. The project site encompasses approximately 6.1 acres across two parcels. The project site consists of Assessor's Parcel Numbers (APNs) 060-261-028 and 060-261-026 and is adjacent to the City of Sebastopol's northwestern boundary. The project site is designated as Office/Light Industrial (OLI) in the 2016 City of Sebastopol General Plan. Residential uses are allowed at a density of 12.1 to 25 units per acre as a secondary use to the primary office/light industrial uses allowed in this land use designation (Sebastopol 2015).

The project site is currently undeveloped but includes existing vegetation and mature trees. An informal pedestrian pathway bisects the site to connect the existing O'Reilly Media Center parking lot to the West County Trail, allowing use of the trail. To the east, the site is directly adjacent to the West County Trail, a paved trail that links Sebastopol with areas to the Northwest, including Graton and Forestville. In addition, the trail connects in downtown Sebastopol to the Joe Rodota Trail, which connect downtown Santa Rosa and Sebastopol. These trails run parallel to Highway 116 to the North of the site and along Highway 12 from eastern Sebastopol to Santa Rosa and is a popular route for cyclists and pedestrians (Sonoma County 2023). (Sonoma County 2023).

Project Characteristics

The proposed project would construct 80 solar all-electric, three-story townhome-style condominiums, with the potential for up to 16 Americans with Disability Act (ADA) accessible accessory dwelling units (ADUs). Table ES-1 provides a summary of the proposed development.

Table ES-1 Proposed Residential Development Summary

Feature	Details
Townhome Project Characteristics	
Residential area	69,317 square feet
Floor Area Ratio (FAR)	1.53[1]
Density	Allowed: 12.1 to 25 dwelling units/acre Proposed: 13.1 dwelling units/acre
Building Height	Allowed: 30 feet and 2 stories Proposed: 40 feet +/- and 3 stories with Density Bonus Waiver
Proposed Dwelling Units	
Three-Bedroom	22 units
Three-Bedroom (with an optional fourth bedroom)	29 units
Three-Bedroom (with an optional elevator and/or fourth bedroom)	13 units
Three-Bedroom (with an optional ADU or fourth bedroom)	16 units
Total Units	**80 units, with a maximum of 16 ADUs**
Proposed Parking	
Garage Parking Within Townhomes	160 spaces
Standard Surface Parking	41 spaces with 10 percent (6 spaces) of electric vehicle charging parking spaces
Compact Surface Parking	17 spaces
Total	**218 spaces**
Total Bicycle Parking Spaces	**96 (80 in garages and 16 in on-site bicycle racks)**
Proposed Open Space	
Common Open Space	107,200 square feet (1,340 square feet per dwelling unit)
Private Open Space (at grade)	216 square feet per dwelling unit
Private Open Space (balconies)	75-230 square feet per dwelling unit

[1] Calculated as the total allowed lot coverage (106,333 square feet) divided by the total ground floor footprint proposed (69,317 square feet)

The proposed 80 units (and potential ADUs) would be distributed throughout 20 buildings. The buildings would be distributed in blocks of three to eight townhomes per building throughout the site. The homes would range from two to four bedrooms and include options for up to 16 accessible ground floor ADUs. Select residences would have the option for personal elevators and would provide additional ADA accessibility. The project includes accessible/adaptable features in each building with an accessible path of travel to connect all buildings. Each residential unit would be three stories and would include a two-car garage and bedroom or ADU on the first floor, kitchen and living spaces on the second floor, and additional bedrooms at the third floor.

Parking and Site Access

Access to the proposed residential units and garages would be taken from newly constructed private streets between the buildings, which would connect to Gravenstein Highway North. Access to the site via Gravenstein Highway North would be provided by two new inlet and outlet points at the northwest and southwest portions of the site on either side of the existing O'Reilly Media Center site. The project would include a total of 160 parking spaces in garages and 58 surface spaces across the site.

Pedestrian and bicycle access to the buildings would be provided via the new internal roadways. The project would include construction of landscaped internal walkways throughout the site, including a new, enhanced 6-foot-wide pedestrian pathway to connect the West County Trail to Gravenstein Highway along the south border of the site; a bicycle repair station is proposed at the same location. The project would include 96 bicycle parking spaces, with 80 long-term spaces located in each residential garage and 16 spaces in onsite bicycle racks.

Landscaping and Open Space

There are currently 133 trees within the project site, and the proposed project would involve the removal of 22 trees while preserving the remaining 111 trees primarily along the perimeter of the site. An existing large, mature coast live oak tree would be retained at the primary entrance to the project entry. Existing oak trees and redwoods would be preserved throughout the site. Additional trees, such as native maples, madrone and dogwood, are proposed to create onsite ecosystems that attract birds and butterflies. Proposed landscaping would include new plantings throughout the open spaces, including the paseo, at the setbacks along drive aisles, roadways, and streets, and surrounding the proposed buildings. Other amenities, including gardens, active and passive seating areas, children's play areas, and a meditation hammock garden are also proposed.

To treat stormwater, the proposed project would include flow-through planters and permeable pavement throughout the project site. Several bioretention facilities and swales are proposed along the perimeter of the site including the north, west, and southwestern boundaries of the site.

Utilities

The City of Sebastopol Public Works would provide water, stormwater, and wastewater collection, treatment, and disposal to the project site. Electricity would be provided by Pacific Gas and Electric (PG&E). Solid waste and recycling services for the site are provided by Recology Sonoma Marin. Police and fire protection services would be provided by the City of Sebastopol. The proposed project includes onsite drainage improvements with bioretention facilities (vegetated buffers and bioswale) and a storm drain network. The inlet and overflow structures of an existing detention pond for the adjacent office park would be modified to detain and control combined drainage from the office park and proposed project.

Construction and Grading

Construction would occur over approximately 31 months. Phase I is anticipated to start in June 2024 and finish in June 2026. Construction would take place within the hours of 7:00 a.m. to 8:00 p.m., Monday through Friday. Phase II is expected to begin in March 2025 and end in February 2027. Site preparation across both phases is anticipated to result in approximately 9,520 cubic yards of cut and fill soil which would be balanced on site. Roughly 2,092 cubic yards and 1,566 cubic yards of soil are anticipated to be imported for Phase I and II, respectively. Some of the soil on the project site was impacted by contamination (refer to Section 4.7, *Hazards and Hazardous Materials*, for more information), and would be buried on-site under six feet of clean fill material. Total construction activities would involve the use and operation of aerial lists, backhoes, cement and mortar mixers, compactors, cranes, dozers, forklifts, graders, loaders, paving equipment, rollers, scrapers, skid steer loaders, and tractors.

Project Objectives

The objectives for the proposed project are to:

- Develop diverse residential uses, including ADUs, that add diversity to the City of Sebastopol's ownership housing supply and meet a variety of residents' needs by encouraging inherent affordability and providing housing opportunities for households at a variety of income levels and life stages.
- Develop a well-designed ownership residential townhome project that includes accessible and adaptable features in every building to provide ADA accessibility beyond what is required by the building code.
- Construct a single, cohesive development consisting of high-quality, contemporary urban design that respects and relates well to its surroundings and respects the urban forest that will remain.
- Bolster the connection between the community and the West County Trail through the preservation of existing pathways and ensuring continued use of the trail.
- Achieve the streamlined and efficient processing and approval of the project including benefits available to developments that include affordable housing consistent with the State Density Bonus Law.

Alternatives

As required by the California Environmental Quality Act (CEQA), this EIR examines alternatives to the proposed project. Studied alternatives include the following four alternatives. Based on the alternatives analysis, Alternative 2 was determined to be the environmentally superior alternative.

- Alternative 1: No Project
- Alternative 2: Reduced Development Density
- Alternative 3: Increased Development Density

Alternative 1 (No Project) assumes that the proposed residential development and subsequent construction of internal roadways, parking, and associated site improvements would not occur, and that the current, undeveloped use of the site would remain. Because no construction or development would occur under the Alternative 1, the 22 trees proposed to be removed for the project would not be removed and the existing 133 trees on site would remain. The No Project Alternative would not meet project objectives related to increasing housing inventory to address statewide and local housing needs or provide housing opportunities for a variety of income levels and life stages within the city of Sebastopol, as residential development would not occur under this alternative.

Alternative 2 (Reduced Development Density) would involve a reduced total buildout of 70 residential units, with the potential for up to 14 accessory dwelling units (ADUs), resulting in 84 potential housing units. Alternative 2 would result in a reduction of 12 residential units compared to the proposed project. Because this alternative would involve fewer residences, less grading and excavation would be required as fewer units, roads, and utility connections would be constructed, and fewer trees would be removed. Furthermore, more of the project site would be available for open space and more trees would remain on site compared to the proposed project. New utility infrastructure would still be required on the project site under this alternative, including stormwater retention basins, internal roadways and parking, and water pipelines between existing water line infrastructure and proposed townhomes. On-site soil contaminants would remain undisturbed under this alternative. Therefore, Alternative 2 would be considered the environmentally superior alternative. However, Alternative 2 would not meet goals related to increasing housing inventory as effectively as the proposed project as development would be reduced compared to the proposed project, and may not be financially feasible due to development costs.

Alternative 3 (Increased Development Density) would involve an increased total buildout of 103 residential units. Alternative 3 would not include the potential for ADUs. Because this alternative would involve 23 more single-family residences compared to the proposed project, more grading and excavation would be required as more unit and utility connections would be constructed, and 27 more on-site trees would be removed. Alternative 3 would result in a maximum building height of 3 stories, similar to the proposed project. Furthermore, less of the project site would be available for open space and less trees would remain on site compared to the proposed project. New utility infrastructure would still be required on the project site under this alternative, including stormwater retention basins, internal roadways and parking, and water pipelines between existing water line infrastructure and proposed townhomes. Alternative 3 would meet the project objectives, similar to the proposed project. These objectives include constructing a single, cohesive development consisting of high-quality, contemporary urban design that respects and relates well to its surroundings and respects the urban forestry that will remain; and bolstering the connection between the community and the West County Trail through the preservation of existing pathways and ensuring continued use of the trail. However, Alternative 3 would not meet goals related to increasing diverse housing inventory as effectively as the proposed project since ADA-accessible ADUs would not be included and would not meet project objectives related to preserving the existing urban forest to the same extent as the proposed project.

Refer to Section 6, *Alternatives*, for the complete alternatives analysis.

Areas of Known Controversy

The EIR scoping process did not identify any areas of known controversy for the proposed project. Responses to the Notice of Preparation of a Draft EIR and input received at the EIR scoping meeting held by the City are summarized in Section 1, *Introduction*.

Issues to be Resolved

The project would require the City's approval of a conditional use permit, site development review, and vesting tentative tract map. In addition, the project applicant proposes the use of a State Density Bonus to allow for a waiver to increase the building height to three stories.

Summary of Impacts and Mitigation Measures

Table ES-2 summarizes the environmental impacts of the proposed project, proposed mitigation measures, and residual impacts (the impact after application of mitigation, if required). Impacts are categorized as follows:

- **Significant and Unavoidable.** An impact that cannot be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires a Statement of Overriding Considerations to be issued if the project is approved per §15093 of the CEQA Guidelines.
- **Less than Significant with Mitigation Incorporated.** An impact that can be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires findings under §15091 of the CEQA Guidelines.
- **Less than Significant.** An impact that may be adverse, but does not exceed the threshold levels and does not require mitigation measures. However, mitigation measures that could further lessen the environmental effect may be suggested if readily available and easily achievable.
- **No Impact:** The proposed project would have no effect on environmental conditions or would reduce existing environmental problems or hazards.

In addition to the environmental impacts included in Table ES-2, the EIR identified several issue areas which would not result in significant impacts which includes Agricultural Resources, Energy, Mineral Resources, Recreation, and Wildfire. These are not included within Table ES-2 but are discussed further within Section 4.16, *Impacts Found to be Less Than Significant*.

Table ES-2 Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts

Impact	Mitigation Measure (s)	Residual Impact
Aesthetics		
Impact AES-1. The proposed project would not have a substantial adverse impact on a scenic vista. Impacts would be less than significant.	None required.	Less than Significant
Impact AES-2. The proposed project would not substantially damage scenic resources including trees, rock outcroppings, or historic buildings within view of a state scenic highway. Impacts would be less than significant with mitigation.	Mitigation Measure BIO-2.	Less than Significant with Mitigation
Impact AES-3. The proposed project is in a non-urbanized area and would not substantially degrade the existing visual character or quality of public views of the site and its surroundings. Impacts would be less than significant.	None required.	Less than Significant

Impact	Mitigation Measure (s)	Residual Impact
Impact AES-4. The proposed project would not create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area. Impacts would be less than significant.	**AES-4 Lighting Specifications.** Exterior lighting installed on the project site must be of low intensity, low glare design, and must be hooded to direct light downward onto the subject parcel and prevent spill-over onto adjacent parcels and must otherwise meet dark night sky requirements. Exterior lighting fixtures must be kept to the minimum number and intensity needed to ensure public safety. Upward directed exterior lighting is prohibited. The final lighting plan must be amended to include identification of all types, sizes, and intensities of wall mounted building lights and landscape accent lighting, and a photometric map must be provided.	Less than Significant with Mitigation
Air Quality		
Impact AQ-1. The project would not conflict with or obstruct implementation of the 2017 Clean Air Plan. Impacts would be less than significant.	None required.	Less than Significant
Impact AQ-2. Project construction and operation would not Exceed the Regional Threshold for any criteria pollutant. the project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard. Impacts would be less than significant.	None required.	Less than Significant with Mitigation
Impact AQ-3. The project would not increase carbon monoxide concentrations such that it would create carbon monoxide hotspots. However, project construction could potentially expose sensitive receptors to substantial pollutant concentrations in the form of toxic air contaminant emissions given the proximity to surrounding and future onsite sensitive receptors. impacts would be less than significant with mitigation incorporated.	**AQ-1 Construction TACs Reduction.** The applicant and project engineer shall include the measures listed below on the grading plan, building plans, and specifications. Prior to issuance of grading permits, the City Engineer and the Chief Building Official shall confirm that the grading plan, building plans, and specifications stipulate that the measures listed below shall be implemented during project construction. The construction contractor shall implement these measures for the duration of construction. ▪ All mobile off-road equipment (wheeled or tracked) used during construction activities shall meet the USEPA Tier 4 final standards. Tier 4 certification can be for the original equipment or equipment that is retrofitted to meet the Tier 4 Final standards. ▪ Alternative Fuel (natural gas, propane, electric, other non-diesel fuels) construction equipment shall be incorporated where available. These requirements shall be incorporated into the contract agreement with the construction contractor. A copy of the equipment's certification or model year specifications shall be available upon request for all equipment on-site. ▪ Electricity shall be supplied to the site from the existing power grid to support the electric	Less than Significant with Mitigation

Impact	Mitigation Measure (s)	Residual Impact
	construction equipment. If connection to the grid is determined to be infeasible for portions of the project, a non-diesel fueled generator shall be used.	
Impact AQ-4. The proposed project would not result in other emissions (such as those leading to odors) that would adversely affect a substantial number of people. Therefore, impacts would be less than significant.	None required.	Less than Significant
Biological Resources		
Impact BIO-1. The project would have a substantial adverse effect on special status animal species. Impacts would be less than significant with mitigation.	**BIO-1(a) Western Bumble Bee Preconstruction Survey.** A qualified biologist(s) shall conduct a pre-construction survey for western bumble bee prior to the onset of work activities at the project site. The pre-construction survey effort shall be conducted for a minimum of one hour. If bumble bees of any species are observed, they shall be photographed for identification following the USFWS guidance in Appendix A *Standardized Bee Photography in the Survey Protocols for the Rusty Patched Bumble Bee* (*Bombus affinis*) (USFWS 2019). If construction begins between March 1 and November 1, the ground shall also be searched during the survey for active bumble bee colonies. No capture or handling of bumble bees shall be conducted, and western bumble bee, if identified, shall be avoided during construction. Foraging bees shall be allowed to leave work areas undisturbed. **BIO-1(b) Roosting Bat Surveys and Avoidance.** Prior to tree removal or ground disturbance, a qualified biologist shall conduct a focused survey of all trees within the project site, to determine whether active roosts of special status bats are present. If tree removal is planned for the fall or winter, the survey shall be conducted in September to ensure tree removal would have adequate time to occur outside periods of hibernation and during seasonal periods of bat activity (March 1 to April 15, September 1 to October 15, or in any month when evening temperatures rise above 45 degrees Fahrenheit and/or no more than 0.5 inch of rainfall within 24 hours occurs, as described below). If tree removal is planned for the spring, then the survey shall be conducted during the earliest feasible time in March to allow for suitable conditions for the detection of bats, and subsequent tree removal. Trees containing suitable potential bat roost habitat features shall be clearly marked or identified. If day roosts are found to be potentially present, the biologist shall prepare a site-specific roosting bat protection plan to be implemented by the contractor following the City's approval. The plan shall incorporate the following guidance as appropriate:	Less than Significant with Mitigation

Impact	Mitigation Measure (s)	Residual Impact
	1) When feasible, removal of trees and structures identified as suitable roosting habitat shall be seasonally timed to avoid disturbance during the hibernation and breeding seasons, including the following: a) Between September 1 and about October 15, or before evening temperatures fall below 45 degrees Fahrenheit and/or more than 0.5 inch of rainfall within 24 hours occurs. b) Between March 1 and April 15, or after evening temperatures rise above 45 degrees Fahrenheit and/or no more than 0.5 inch of rainfall within 24 hours occurs. 2) If a tree must be removed during the breeding season and is identified as potentially containing a maternity roost, then a qualified biologist shall conduct visual or acoustic emergence surveys or implement other appropriate methods as determined by the biologist to further evaluate if the roost is an active maternity roost. If it is determined that an active maternity roost of a colonial roosting species is present, the roost shall not be disturbed during the breeding season (April 15 to August 31). If it is determined to not be an active maternity roost, the tree or structure may be removed under the guidance of the qualified biologist. Potential non-colonial hibernation roosts shall only be removed during seasonal periods of bat activity outside the hibernation and breeding seasons. Potential non-colonial roosts that cannot be avoided shall be removed on warm days in late morning to afternoon when any bats present are likely to be warm and able to fly. Appropriate methods as determined by the qualified biologist shall be used to minimize the potential harm to bats during tree or structure removal. For trees, such methods may include using a two-step tree removal process. This method is conducted over two consecutive days and works by creating noise and vibration by cutting non-habitat branches and limbs from habitat trees using chainsaws only (i.e., no excavators or other heavy machinery) on the first day with the remainder of tree removal occurring on the second day. **BIO-1(c) Nesting Bird Survey.** If construction, vegetation trimming, or tree removals are scheduled to occur during the nesting bird season (February 1 through August 31), the project applicant shall retain a qualified biologist to conduct a pre-construction nesting bird survey no more than 14 days prior to the start of construction to determine the presence/absence of nesting birds and raptors within the project site and adjacent areas. The survey shall include the entire site plus a 100-foot buffer, as accessible. If active nests are found, the qualified biologist shall establish an appropriate avoidance	

Impact	Mitigation Measure (s)	Residual Impact
	buffer, considering the species sensitivity and physical location of the nest (e.g., line of site to the work area), to comply with CFGC 3503 and 3503.5. The buffer shall be at least 50 feet for non-raptor bird species and 250 feet for raptor species, unless a smaller buffer is determined protective of nesting birds by the qualified biologist. To prevent encroachment, the established buffer(s) shall be clearly marked by high visibility material installed by the contractor. The established buffer(s) shall remain in effect until the young have fledged or the nest has been abandoned as confirmed by the qualified biologist. The City shall review and approve the biologists' findings and buffer during construction, as appropriate.	
Impact BIO-2. The project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community, and the project would not have a substantial adverse effect on state or federally protected wetlands. The project would not 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. There would be no impact.	None required.	No Impact
Impact BIO-3. The project could conflict with the City of Sebastopol Municipal Code tree protection ordinance. This impact would be less than significant with mitigation.	**BIO-2 Tree Replacement.** All protected ordinance-sized trees removed from the project site shall be replaced as appropriate for the size class and species of the tree removed, based on the City of Sebastopol tree mitigation requirements for protected native trees, as determined by the Tree Board or the City Arborist. Two replacement trees shall be either planted onsite for each protected tree removed or at a City-approved offsite location, or a fee of $75 per replacement tree would be provided to the City of Sebastopol tree fund in-lieu for off-site tree planting in the community. If onsite/offsite planting is implemented, a replacement tree planting plan shall be approved by the City along with landscape plans prior to project implementation.	Less than Significant with Mitigation
Impact BIO-4. The project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. There would be no impact	None required.	No Impact

Impact	Mitigation Measure (s)	Residual Impact
Cultural Resources		
Impact CUL-1. The project would not cause a substantial adverse change in the significance of a historical resource, as there are no such resources on the project site. There would be no impact.	None required.	No Impact
Impact CUL-2. Grading and excavation required for the proposed project would have the potential to unearth and adversely change or damage previously unidentified historical and archaeological resources. Impacts would be less than significant with implementation of mitigation.	**CUL-2 Archaeological Resources Assessment, Evaluation, and Treatment.** In the event that archaeological resources are unexpectedly encountered during ground-disturbing construction activities, the construction contractor shall halt work within 100 feet of the find, and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service 1983) shall be contacted immediately to evaluate the find, as well as the Sebastopol Planning Department. If the find is determined by the qualified archaeologist to be Native American in origin, then a Native American representative shall also be contacted to participate in the evaluation of the find. If necessary, archaeological testing for CRHR eligibility shall be completed. If the discovery proves to be eligible for the CRHR and impacts to the resource cannot be avoided via project redesign, a qualified archaeologist shall prepare a data recovery plan tailored to the physical nature and characteristics of the deposit, per the requirements of PRC Section 15126.4(b)(3)(C). The data recovery plan shall identify data recovery excavation methods, measurable objectives, and data thresholds to reduce any significant impacts to cultural resources. Pursuant to the data recovery plan, the qualified archaeologist and Native American representative, as appropriate, shall recover and document the scientifically consequential information that justifies the resource's significance. The City shall review and, in consultation with approve the treatment plan and archaeological testing as appropriate, and the resulting documentation shall be submitted to the regional repository of the California Historical Resources Information System, per PRC Section 15126.4(b)(3)(C).	Less than Significant with Mitigation
Impact CUL-2. Grading and excavation required for the project would have the potential to unearth and disturb previously unidentified or unknown human remains. Compliance with existing regulations pertaining to discovery of human remains would ensure impacts are less than significant.	None required	Less than Significant

Impact	Mitigation Measure (s)	Residual Impact
Geology and Soils		
Impact GEO-1. The proposed project would not directly or indirectly cause potential substantial adverse effects, including risk of loss, injury, or death involving rupture of a known earthquake fault. Impacts would be less than significant.	None required.	Less than Significant
Impact GEO-2. The proposed project would not directly or indirectly cause potential substantial adverse effects including the risk of loss, injury, or death involving strong seismic ground shaking. Impacts would be less than significant.	None required.	Less than Significant
Impact GEO-3. The project could cause substantial adverse effects including the risk of loss, injury, or death involving seismic- related ground failure including liquefaction, landslides, lateral spreading, subsidence, or collapse. Impacts would be less than significant.	None required.	Less than Significant
Impact GEO-4. The proposed project would not result in substantial soil erosion or loss of topsoil. Impacts would be less than significant.	None required.	Less than Significant
Impact GEO-5. Portions of the project site have the potential to be located on expansive soil, as defined in Table 1-B of the Uniform Building Code, which may result in direct or indirect risks to life or property. Impacts would be less than significant.	None required.	Less than Significant
Impact GEO-6. The project has the potential to significantly impact paleontological resources. These impacts would be less than significant with mitigation.	**GEO-7 Paleontological Resources Monitoring and Mitigation.** *Qualified Professional Paleontologist.* Prior to excavation, City Ventures shall retain a Qualified Professional Paleontologist, as defined by the Society of Vertebrate Paleontology (SVP; 2010). The Qualified Professional Paleontologist shall draft a Paleontological Resources Mitigation and Monitoring Plan, which shall direct all mitigation measures related to paleontological resources. *Paleontological Worker Environmental Awareness Program.* Prior to the start of construction, the Qualified Professional Paleontologist or their designee shall conduct a paleontological Worker Environmental Awareness Program (WEAP) training for construction personnel regarding the appearance of fossils and the procedures for notifying paleontological staff should fossils be discovered by construction personnel.	Less than Significant with Mitigation

Impact	Mitigation Measure (s)	Residual Impact
	Paleontological Monitoring. Full-time paleontological monitoring shall be conducted during ground disturbing construction activities within previously undisturbed sediments. Paleontological monitoring shall be conducted by a paleontological monitor with experience with collection and salvage of paleontological resources and who meets the minimum standards of the SVP (2010) for a Paleontological Resources Monitor. The Qualified Professional Paleontologist may recommend that monitoring be reduced in frequency or ceased entirely based on geologic observations. Such decisions shall be subject to review and approval by the City of Sebastopol. In the event of a fossil discovery by the paleontological monitor or construction personnel, all construction activity within 50 feet of the find shall cease, and the Qualified Professional Paleontologist shall evaluate the find. If the fossil(s) is (are) not scientifically significant, then construction activity may resume. If it is determined that the fossil(s) is (are) scientifically significant, the following shall be completed: ▪ Fossil Salvage. The paleontological monitor shall salvage (i.e., excavate and recover) the fossil to protect it from damage/destruction. Typically, fossils can be safely salvaged quickly by a single paleontological monitor with minimal disruption to construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. Bulk matrix sampling may be necessary to recover small invertebrates or microvertebrates from within paleontologically sensitive deposits. After the fossil(s) is (are) salvaged, construction activity may resume. ▪ Fossil Preparation and Curation. Fossils shall be identified to the lowest (i.e., most-specific) possible taxonomic level, prepared to a curation-ready condition, and curated in a scientific institution with a permanent paleontological collection along with all pertinent field notes, photos, data, and maps. Fossils of undetermined significance at the time of collection may also warrant curation at the discretion of the Qualified Professional Paleontologist. *Final Paleontological Mitigation Report.* Upon completion of ground-disturbing activities (or laboratory preparation and curation of fossils, if necessary), the Qualified Professional Paleontologist shall prepare a final report describing the results of the paleontological monitoring efforts. The report shall include a summary of the field and laboratory methods employed; an overview of project geology; and, if fossils were discovered, an analysis of the fossils, including physical description, taxonomic	

Impact	Mitigation Measure (s)	Residual Impact
	identification, and scientific significance. The report shall be submitted to the City of Sebastopol and, if fossil curation occurred, the designated scientific institution.	
Greenhouse Gas Emissions		
Impact GHG-1. The proposed project would be consistent with BAAQMD's GHG thresholds for buildings and transportation. Therefore, the project would not generate GHG emissions that may have a significant impact on the environment. This impact would be less than significant with implementation of Mitigation Measure GHG-1.	**GHG-1 CALGreen Tier 2 EV Requirements.** Prior to issuance of building permits, the City Engineer and the Chief Building Official shall confirm that the applicant shall include the following design feature as part of the project to be consistent with CALGreen Tier 2 EV standards: A minimum of 15 percent of the total number of parking spaces shall be equipped with EV charging stations.	Less than Significant with Mitigation
Impact GHG-2. The proposed project would be consistent with goals and policies from CARB's 2022 Scoping Plan, Plan Bay Area 2050, the City's Climate Action Framework, and the General Plan. Therefore, this impact would be less than significant.	None required.	Less than Significant
Hazards and Hazardous Materials		
Impact HAZ-1. The proposed project would include construction and operation which could involve the use, storage, disposal or transportation of hazardous materials. However, compliance with Federal, State, and local regulations would reduce potential impacts. Impacts would be less than significant.	None required.	Less than Significant
Impact HAZ-2. Sebastopol Independent Charter School is located within 0.25 mile of the proposed project. The proposed project would not emit or handle hazardous or acutely hazardous materials. This impact would be less than significant.	Mitigation Measure HAZ-3(b)	Less than Significant with Mitigation
Impact HAZ-3. The project site is associated with an open Voluntary Agreement cleanup case and is therefore included on a list of hazardous materials sites compiled pursuant to Section 65962.5. There are known hazardous material impacts to soil at the project site. However, compliance with applicable regulations and mitigation for potential soil and/or groundwater impacts at the project site would minimize hazards from the proposed project. This impact would be less than significant with mitigation incorporated.	**HAZ-3a DTSC Regulatory Agency Submittal.** The DTSC shall continue to be utilized for agency oversight of assessment and remediation of the project site through completion of construction activities. Prior to commencement of construction and grading activities at the project site, the project applicant shall submit the following documents to the DTSC project manager of the open Voluntary Agreement cleanup case: ▪ Current development plan and any modifications to the development plan ▪ All environmental documents completed for the project, including this Initial Study document ▪ All future environmental documents completed for the project	Less than Significant with Mitigation

Impact	Mitigation Measure (s)	Residual Impact
	Upon submittal of the information above, and in accordance with the 2023 DTSC Standard Voluntary Agreement, DTSC may require actions such as: development of subsurface investigation workplans; completion of soil, soil vapor, and/or groundwater subsurface investigations; installation of soil vapor or groundwater monitoring wells; soil excavation and offsite disposal; completion of human health risk assessments; and/or completion of remediation reports or case closure documents. Subsurface soil, soil vapor, and groundwater investigations, if required, shall be conducted in accordance with a sampling plan that shall be reviewed and approved by the DTSC. The DTSC approval documents shall be submitted to and reviewed by the City prior to issuing grading permits. **HAZ-3b Soil Management Plan.** Prior to commencement of construction and grading activities at the project site, the project applicant shall retain a qualified consultant (Professional Geologist [PG] or Professional Engineer [PE]) to prepare a Soil Management Plan (SMP) for the project site. The SMP shall address: 1. On-site handling and management of impacted soils or other impacted wastes (e.g., stained soil, and soil or groundwater with solvent or chemical odors) if such soils or impacted wastes are encountered, and 2. Specific actions to reduce hazards to construction workers and offsite receptors during the construction phase. The SMP must establish remedial measures and soil management practices to ensure construction worker safety, the health of future workers and residents, and prevent the off-site migration of contaminants from the project site. These measures and practices may include, but are not limited to: ▪ Stockpile management, including stormwater pollution prevention and the installation of BMPs ▪ Proper disposal procedures for contaminated materials ▪ Investigation procedures for encountering known and unexpected odorous or visually stained soils, other indications of hydrocarbon piping or equipment, and/or debris during ground-disturbing activities ▪ Monitoring and reporting ▪ A health and safety plan for contractors working at the project site that addresses the safety and health hazards of each phase of project site construction activities with the requirements and procedures for employee protection ▪ The health and safety plan shall outline proper soil handling procedures and health and safety requirements to minimize worker and public	

Impact	Mitigation Measure (s)	Residual Impact
	exposure to hazardous materials during construction. The DTSC shall review and approve the SMP prior to construction (grading) activities at the project site. The City shall review and approve the DTSC-approved SMP prior to issuing grading permits. The project applicant shall implement the SMP during , grading and construction at the project site.	
Impact HAZ-4. The project site is not located in an airport land use plan or in the vicinity of a private airstrip. No impacts related to airports would occur.	None required.	No Impact
Impact HAZ-5. The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Impacts would be less than significant.	None required.	Less than Significant
Impact HAZ-6. The project site is in an urban area and is not near wildlands. No impact related to wildland fires would occur.	None required.	No Impact
Hydrology and Water Quality		
Impact HYD-1. Development facilitated by the project would not violate water quality standards or Waste Discharge Requirements, or otherwise substantially degrade surface or groundwater quality. Impacts would be less than significant with mitigation.	None required.	Less than Significant
Impact HYD-2. Development facilitated by the project would not interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of local groundwater basins. Impacts would be less than significant.	None required.	Less than Significant
Impact HYD-3. The proposed project would alter drainage patterns and increase runoff in the area but would not result in substantial erosion or siltation on- or off- site. Impacts would be less than significant.	None required.	Less than Significant
Impact HYD-4. The proposed project would alter drainage patterns and increase runoff in the area but would not result in increased flooding on or off site. Impacts would be less than significant.	None required.	Less than Significant

Impact	Mitigation Measure (s)	Residual Impact
Impact HYD-5. The proposed project would alter drainage patterns and increase runoff in the area but would not exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional polluted runoff. Impacts would be less than significant with mitigation.	Mitigation Measure HAZ-3(a) and HAZ-3(b)	Less than Significant with Mitigation
Impact HYD-6. The proposed project would not conflict with or obstruct the North Coast RWQCB Basin Plan or Santa Rosa Plain Subbasin GSP, pursuant to compliance with applicable water quality regulations. Impacts would be less than significant with mitigation.	Mitigation Measure HAZ-3(a) and HAZ-3(b)	Less than Significant with Mitigation
Land Use and Planning		
Impact LU-1. The project would not physically divide an established community. No impact would occur.	None required.	No Impact
Impact LU-2. The project would not conflict with the goals or policies in the City's General Plan or the SMC. This impact would be less than significant.	None required.	Less than Significant
Noise		
Impact NOI-1. Construction of the project would temporarily increase ambient noise levels, but noise levels would not exceed applicable standards. Ambient noise in the project vicinity would increase from on-site activities and increased traffic. Traffic noise increases would be less than significant. operational stationary source noise would exceed standards established by the City. Impacts would be less than significant with mitigation.	**NOI-1 Mechanical Equipment Noise Reduction.** For outdoor condensing units (HVAC) and transformers directly adjacent to noise-sensitive receptors, provide a solid barrier with a height blocking the line-of-sight to the nearby noise-sensitive receptors. The minimum density of the barrier shall be 2 pounds per square foot with no holes or gaps. Once final equipment selection is made, an acoustical analysis of the noise from project mechanical and electrical equipment to surrounding properties must be completed by a qualified acoustical consultant prior to final design to verify compliance with the City's nighttime exterior noise standard of 45 dBA.	Less than Significant with Mitigation
Impact NOI-2. Project construction would intermittently generate groundborne vibration on a site which may affect sensitive receptors near the project site, but project vibration would not create excessive levels of vibration that could cause architectural damage. Impacts would be less than significant.	None required.	Less than Significant
Impact NOI-3. The project would not expose people residing or working in the Project Area to excessive noise levels related to airstrip/airport operation. No impact would occur.	None required.	No Impact

Impact	Mitigation Measure (s)	Residual Impact
Population and Housing		
Impact POP-1. The proposed project would construct 80 new single-family residences and up to 16 accessory dwelling units, which would increase the population in Sebastopol. However, the growth anticipated as a result of the project is accounted for in the City's Housing Element. Impacts would be less than significant.	None required.	Less than Significant
Impact POP-2. The proposed project would not result in the displacement of substantial numbers of housing or people. The project would facilitate the development of new housing in Sebastopol in accordance with state and local housing goals. There would be no impact.	None required.	No Impact
Public Services		
Impact PS-1. The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities, or need new or physically altered fire protection facilities. Impacts would be less than significant.	None required.	Less than Significant
Impact PS-2. The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered police protection FACILITIES OR need new or physically altered police protection facilities. Impacts would be less than significant.	None required.	Less than Significant
Impact PS-3. The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered schools or need new or physically altered schools. Impacts would be less than significant.	None required.	Less than Significant
Impact PS-4. The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered PARKS OR need new or physically altered parks. Impacts would be less than significant.	None required.	Less than Significant

Impact	Mitigation Measure (s)	Residual Impact
Impact PS-5. The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered public facilities or need new or physically altered public facilities. Impacts would be less than significant.	None required.	Less than Significant
Transportation		
Impact TRA-1. The project would conflict with General Plan Action CIR 1f relating to pedestrian facilities. Incorporation of Mitigation Measure TRA-1 would ensure compliance with all relevant plans, programs, ordinances and policies. Impacts would be less than significant with mitigation incorporated.	**TRA-1 Pedestrian Connectivity and Safety**. A new pedestrian path shall be added through the center of the project site in order to link the project and mixed commercial office park to the new HAWK crossing across the north leg of the intersection of SR 116/Danmar Drive after Caltrans constructs the HAWK crossing and before an occupancy permit is issued.	Less than Significant with Mitigation
Impact TRA-2. Vehicle miles traveled (VMT) attributable to the proposed project would not exceed the County's thresholds for residential projects. Therefore, the impact related to VMT would be less than significant.	None required.	Less than Significant
Impact TRA-3. The proposed project would not introduce design features or incompatible uses that could increase traffic hazards. This impact would be less than significant.	None required.	Less than Significant
Impact TRA-4. The proposed project would not result in inadequate emergency access. This impact would be less than significant.	None required.	Less than Significant
Tribal Cultural Resources		
Impact TCR-1. Grading and excavation required for the proposed project would have potential to unearth and impact or damage Tribal Cultural Resources. Impacts would be less than significant with implementation of mitigation.	**TCR-1 Suspension of Work Around Tribal Cultural Resources.** If cultural resources of Native American origin are identified during implementation of the proposed project, all earth-disturbing work within 50 feet of the find shall cease and desist until an archaeologist has evaluated the nature and significance of the find as a cultural resource and an appropriate local Native American representative is consulted. Staking of the area of discovery will be implemented with stakes no more than 10 feet apart, forming a circle having a radius of no less than 100 feet from the point of discovery. If the City, in consultation with local Native American tribes, determines that the resource is a tribal cultural resource and thus significant under CEQA, a mitigation plan shall be prepared and implemented in accordance with state guidelines and in consultation with local Native American group(s). The plan shall include avoidance of the resource or, if avoidance of the resource is infeasible, the plan shall outline the appropriate treatment of the resource in coordination with the appropriate local Native American tribal	Less than Significant with Mitigation

Impact	Mitigation Measure (s)	Residual Impact
	representative and, if applicable, a qualified archaeologist. Examples of appropriate mitigation for tribal cultural resources include, but are not limited to, protecting the cultural character and integrity of the resource, protecting traditional use of the resource, protecting the confidentiality of the resource, or heritage recovery.	
Utilities and Service Systems		
Impact UTIL-1. The proposed project would not require the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities. The proposed project would be adequately served by existing facilities to meet the project's projected demands. Impacts would be less than significant.	None required.	Less than Significant
Impact UTIL-2. There are sufficient water supplies available to serve the proposed project during normal, dry, and multi-dry year conditions. Impacts would be less than significant.	None required.	Less than Significant
Impact UTIL-3. The proposed project would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, would not impair the attainment of solid waste reduction goals, and would comply with Federal, State, and local statutes and regulations related to solid waste. Impacts would be less than significant.	None required.	Less than Significant

1 Introduction

This document is an Environmental Impact Report (EIR) for a proposed residential development located at 1009 and 1011 Gravenstein Highway North, Sebastopol, California. The Canopy Project (hereafter referred to as the "proposed project" or "project") would be constructed on a site that is currently undeveloped with mature trees and an informal pedestrian pathway that connects the West County Trail to the O'Reilly Media Center parking lot. The proposed project would construct 80 solar all-electric, three-story townhome-style condominiums, with the potential for up to 16 Americans with Disability Act (ADA) accessible accessory dwelling units (ADUs). Other components of the project include newly constructed internal roadways, 160 automobile parking spaces in garages and 58 automobile surface spaces across the site, and 96 bicycle parking spaces. The project would involve the removal of 22 trees while the remaining 111 trees would be preserved. Additional trees and amenities including gardens, active and passive seating areas, children's play areas, and a meditation hammock garden are proposed.

This section discusses (1) the project and EIR background; (2) the legal basis for preparing an EIR; (3) the scope and content of the EIR; (4) issue areas found not to be significant; (5) the lead, responsible, and trustee agencies; and (6) the environmental review process required under the California Environmental Quality Act (CEQA). The proposed project is described in detail in Section 2, *Project Description*.

1.1 Environmental Impact Report Background

The City of Sebastopol distributed a Notice of Preparation (NOP) of the EIR for a 30-day agency and public review period starting on July 6, 2023 and ending on August 7, 2023. In addition, the City held an EIR Scoping Meeting on July 18, 2023. The meeting, held at 3:00 PM, was aimed at providing information about the proposed project to members of public agencies, interested stakeholders and residents/community members. The meeting was held at Sebastopol Community Center at 425 Morris Street, Sebastopol, CA and online via Zoom. The City received letters from two agencies in response to the NOP during the public review period, as well as various verbal comments during the EIR Scoping Meeting. The NOP is presented in Appendix A of this EIR. Table 1-1 on the following page summarizes the content of the letters and verbal comments and where the issues raised are addressed in the EIR.

1.2 Purpose and Legal Authority

The proposed project requires the discretionary approval of the City of Sebastopol Planning Commission; therefore, the project is subject to the environmental review requirements of CEQA. In accordance with Section 15121 of the *CEQA Guidelines* (California Code of Regulations, Title 14), the purpose of this EIR is to serve as an informational document that:

> "...will inform public agency decision makers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project."

This EIR has been prepared as a project EIR pursuant to Section 15161 of the *CEQA Guidelines*. A Project EIR is appropriate for a specific development project. As stated in the *CEQA Guidelines*:

> "This type of EIR should focus primarily on the changes in the environment that would result from the development project. The EIR shall examine all phases of the project, including planning, construction, and operation."

This EIR is to serve as an informational document for the public and City of Sebastopol decision makers. The process will include public hearings before the Planning Commission to consider certification of a Final EIR and approval of the proposed project.

Table 1-1 NOP Comments and EIR Response

Commenter	Comment/Request	How and Where It Was Addressed
Agency Comments		
Department of Toxic Substances Control (DTSC)	States that the project is listed in the DTSC EnviroStor database as an active voluntary agreement cleanup site. DTSC and the Proponent, City Ventures Homebuilding, LLC entered into a new Standard Voluntary Agreement (SVA) on April 26, 2023.	Comments are addressed in Section 4.7, *Hazards and Hazardous Materials*.
	States that the EIR should discuss and analyze the contaminant history and all related site investigation reports, and identify and analyze the proposed remediation activities to address the contaminants on-site.	
California Department of Transportation (Caltrans)	Requests that if the project meets the screening criteria established in the City's adopted Vehicle Miles Traveled (VMT) policy to be presumed to have a less-than-significant VMT impact and exempt from detailed VMT analysis, that justification is provided to support the exempt status in alignment with the City's VMT policy.	Comments are addressed in Section 4.13, *Transportation*. A Traffic Impact Study (TIS) prepared for the project is included as an appendix (Appendix G). The TIS includes additional background information regarding collision history and existing pedestrian and biking conditions.
	Requests that if the project does not meet the screening criteria, to include a detailed VMT analysis in the DEIR that includes VMT analysis pursuant to the City's guidelines; a schematic illustration of walking, biking and auto collisions at the project site; and the project's primary and secondary effects on pedestrians, bicycles, travelers with disabilities and transit performance.	
	States that potential impacts to the State Right-of-Way from project-related temporary access points should be analyzed.	
	States that mitigation for significant impacts due to construction and noise should be identified.	
	States the proposed project would require a Caltrans transportation permit for the transportation of heavy construction equipment and/or materials which requires the use of oversized-transport vehicles.	
	States that prior to construction, coordination may be required with Caltrans to develop a Transportation Management Plan (TMP) to reduce construction traffic impacts to the STN.	

Commenter	Comment/Request	How and Where It Was Addressed
	States that the City of Sebastopol is responsible for all project mitigation, including any needed improvements to the STN.	
	States that if any Caltrans facilities are impacted by the project, those facilities must meet American Disabilities Act (ADA) Standards after project completion. As well, the project must maintain bicycle and pedestrian access during construction.	
Public Comments from the NOP Scoping Meeting		
Aesthetics	The commenter expresses concern about light pollution.	Comments are addressed in Section 4.1, *Aesthetics and* Section 4.9, *Land Use and Planning.*
	Commenter questions how tall the buildings will be. Commenter expresses concern about building height.	
Biological Resources	Commenter requests information regarding trees to be removed.	Comments are addressed in Section 4.3, *Biological Resources* and Section 4.1, *Aesthetics.*
Hazards and Hazardous Materials	Commenter expresses concern regarding historical use of the project site and associated hazardous materials.	Comments are addressed in Section 4.7, *Hazards and Hazardous Materials.*
	The commenter requests that any reports regarding hazardous materials be analyzed and shared with the community.	
Public Services	Commenter questions if the project would be served by Sebastopol Police.	Comment is addressed in Section 4.12, *Public Services.*
Population and Housing	Commenter requests information regarding State and Federal housing requirements.	Comments regarding housing requirements are addressed in Section 4.11, *Population and Housing* and comments regarding affordable and diverse housing are addressed in Section 4.9, *Land Use and Planning*.
	Commenter questions if the project includes affordable or senior housing.	
Traffic	Commenter requests information regarding site access.	Comments are addressed in Section 4.13, *Transportation*.
	Commenter expresses concern regarding traffic during school hours.	
	Commenter questions whether mitigation measures will be implemented to address traffic in the area.	
	Commenter expresses concerns about transportation improvements.	
	Commenter questions if there will be site access from Hurlbut Avenue.	

1.3 Scope and Content

Impacts related to the following issue areas were found to be potentially significant and have been studied in depth in the EIR:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Population and Housing
- Public Services
- Transportation
- Tribal Cultural Resources
- Utilities and Service Systems

Impacts in the following issue areas were found not to be significant and are analyzed in Section 4.16, *Impacts Found to be Less than Significant*.

- Agriculture
- Forestry
- Energy
- Minerals
- Recreation
- Wildfire

In preparing the EIR, use was made of pertinent City policies and guidelines, certified EIRs and adopted CEQA documents, technical reports, and other background documents. A full reference list is contained in Section 7, *References and Preparers*.

The alternatives section of the EIR (Section 6) was prepared in accordance with Section 15126.6 of the *CEQA Guidelines* and focuses on alternatives that are capable of eliminating or reducing significant adverse effects associated with the project while feasibly attaining most of the basic project objectives. In addition, the alternatives section identifies the "environmentally superior" alternative among the alternatives assessed. The alternatives evaluated include the CEQA-required "No Project" alternative and two alternative development scenarios for the project area.

The level of detail contained throughout this EIR is consistent with the requirements of CEQA and applicable court decisions. Section 15151 of the *CEQA Guidelines* provides the standard of adequacy on which this document is based. The *Guidelines* state:

> "An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of the proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection, but for adequacy, completeness, and a good faith effort at full disclosure."

1.4 Lead, Responsible, and Trustee Agencies

The *CEQA Guidelines* define lead, responsible and trustee agencies. The City of Sebastopol is the lead agency for the project because it holds principal responsibility for approving the project.

A responsible agency refers to a public agency other than the lead agency that has discretionary approval over the project. The Department of Toxic Substances Control (DTSC) is a responsible agency. DTSC is responsible for approving the Soil Management Plan (SMP) for the project prior to construction (grading) activities at the project site. A trustee agency refers to a state agency having jurisdiction by law over natural resources affected by a project. There are no trustee agencies for the proposed project.

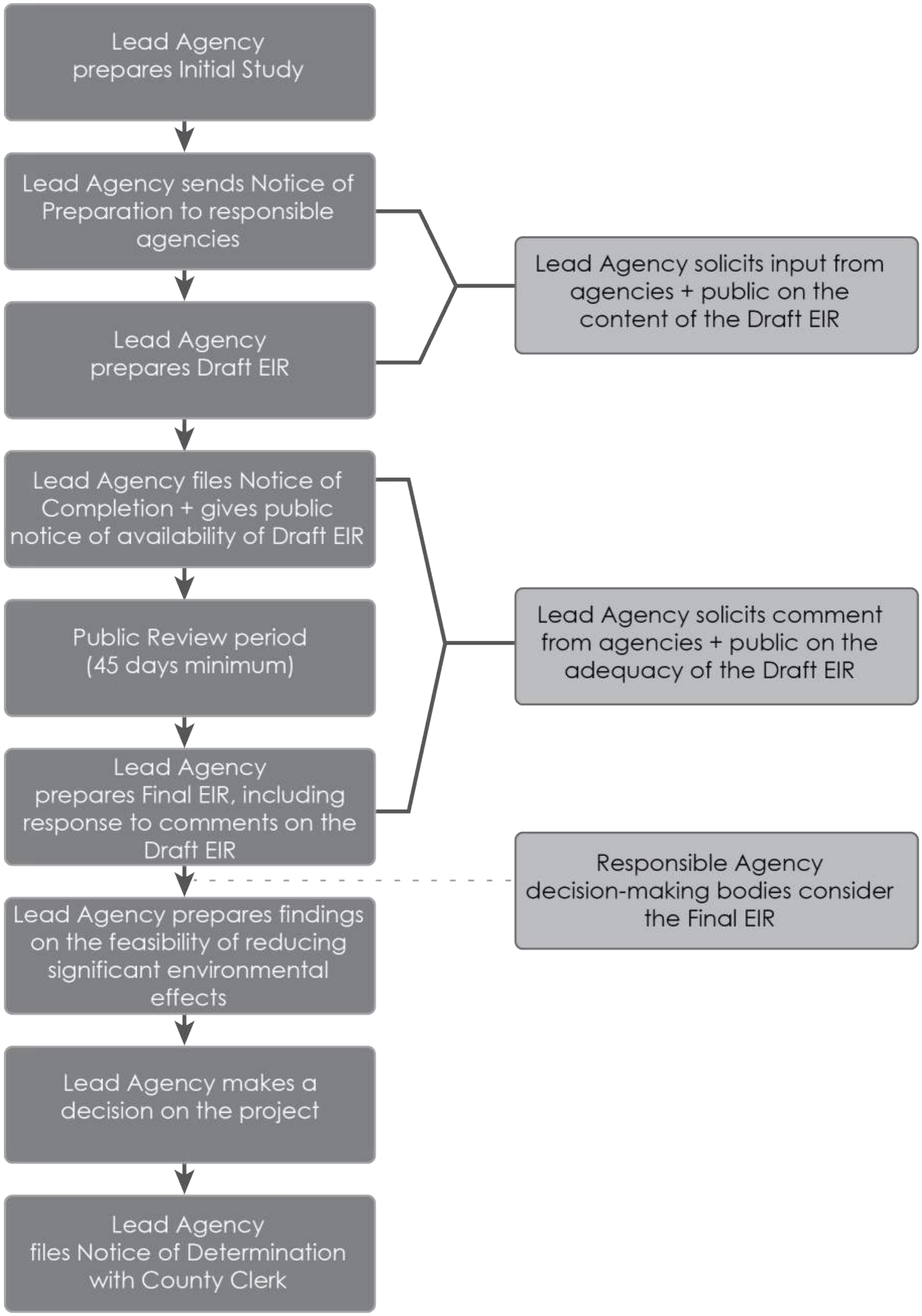
1.5 Environmental Review Process

The environmental impact review process, as required under CEQA, is summarized below and illustrated in Figure 1-1. The steps are presented in sequential order.

1. **Notice of Preparation (NOP) and Initial Study**. After deciding that an EIR is required, the lead agency (City of Sebastopol) must file a NOP soliciting input on the EIR scope to the State Clearinghouse, other concerned agencies, and parties previously requesting notice in writing (*CEQA Guidelines* Section 15082; Public Resources Code Section 21092.2). The NOP must be posted in the City Clerk's office for 30 days. The NOP may be accompanied by an Initial Study that identifies the issue areas for which the project could create significant environmental impacts.
2. **Draft EIR Prepared.** The Draft EIR must contain: a) table of contents or index; b) summary; c) project description; d) environmental setting; e) discussion of significant impacts (direct, indirect, cumulative, growth-inducing and unavoidable impacts); f) a discussion of alternatives; g) mitigation measures; and h) discussion of irreversible changes.
3. **Notice of Completion (NOC).** The lead agency must file a NOC with the State Clearinghouse when it completes a Draft EIR and prepare a Public Notice of Availability of a Draft EIR. The lead agency must place the NOC in the City Clerk's office for 30 days (Public Resources Code Section 21092) and send a copy of the NOC to anyone requesting it (*CEQA Guidelines* Section 15087). Additionally, public notice of Draft EIR availability must be given through at least one of the following procedures: a) publication in a newspaper of general circulation; b) posting on and off the project site; and c) direct mailing to owners and occupants of contiguous properties. The lead agency must solicit input from other agencies and the public and respond in writing to all comments received (Public Resources Code Sections 21104 and 21253). The minimum public review period for a Draft EIR is 30 days. When a Draft EIR is sent to the State Clearinghouse for review, the public review period must be 45 days unless the State Clearinghouse approves a shorter period (Public Resources Code 21091).
4. **Final EIR.** A Final EIR must include: a) the Draft EIR; b) copies of comments received during public review; c) list of persons and entities commenting; and d) responses to comments.
5. **Certification of Final EIR.** Prior to making a decision on a proposed project, the lead agency must certify that: a) the Final EIR has been completed in compliance with CEQA; b) the Final EIR was presented to the decision-making body of the lead agency; and c) the decision making body reviewed and considered the information in the Final EIR prior to approving a project (*CEQA Guidelines* Section 15090).

6. **Lead Agency Project Decision.** The lead agency may a) disapprove the project because of its significant environmental effects; b) require changes to the project to reduce or avoid significant environmental effects; or c) approve the project despite its significant environmental effects, if the proper findings and statement of overriding considerations are adopted (*CEQA Guidelines* Sections 15042 and 15043).
7. **Findings/Statement of Overriding Considerations**. For each significant impact of the project identified in the EIR, the lead agency must find, based on substantial evidence, that either: a) the project has been changed to avoid or substantially reduce the magnitude of the impact; b) changes to the project are within another agency's jurisdiction and such changes have or should be adopted; or c) specific economic, social, or other considerations make the mitigation measures or project alternatives infeasible (*CEQA Guidelines* Section 15091). If an agency approves a project with unavoidable significant environmental effects, it must prepare a written Statement of Overriding Considerations that sets forth the specific social, economic, or other reasons supporting the agency's decision.
8. **Mitigation Monitoring Reporting Program.** When the lead agency makes findings on significant effects identified in the EIR, it must adopt a reporting or monitoring program for mitigation measures that were adopted or made conditions of project approval to mitigate significant effects.
9. **Notice of Determination (NOD).** The lead agency must file a NOD after deciding to approve a project for which an EIR is prepared (*CEQA Guidelines* Section 15094). A local agency must file the NOD with the City Clerk. The NOD must be posted for 30 days and sent to anyone previously requesting notice. Posting of the NOD starts a 30-day statute of limitations on CEQA legal challenges (Public Resources Code Section 21167[c]).

Figure 1-1 Environmental Review Process



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2 Project Description

This section describes the proposed project, including the project applicant, the project site and surrounding land uses, major project characteristics, project objectives, and discretionary actions needed for approval.

2.1 Lead Agency and Contact

City of Sebastopol
7120 Bodega Avenue
Sebastopol, California 95472
Contact: John Jay, Associate Planner, Planning Department
(707) 823-6167

2.2 Project Applicant

City Ventures
444 Spear Street, Suite 200
San Francisco, California 94105

2.3 Project Location

The project site is located at 1009-1011 Gravenstein Highway North, on the east side of Gravenstein Highway North southeast of its intersection with Mill Station Road, within the City of Sebastopol. The project site encompasses approximately 6.1 acres across two parcels. The project site consists of Assessor's Parcel Numbers (APNs) 060-261-028 and 060-261-026 and is adjacent to the City of Sebastopol's northwestern boundary (City of Sebastopol 2023). The project site is roughly bounded by the O'Reilly Media Center to the west, Gravenstein Highway North to the north, and primarily residential uses to the east and south. Figure 2-1 shows the regional location of the project site and Figure 2-2 shows the project site's immediate location and selected nearby land uses.

Figure 2-1 Regional Location

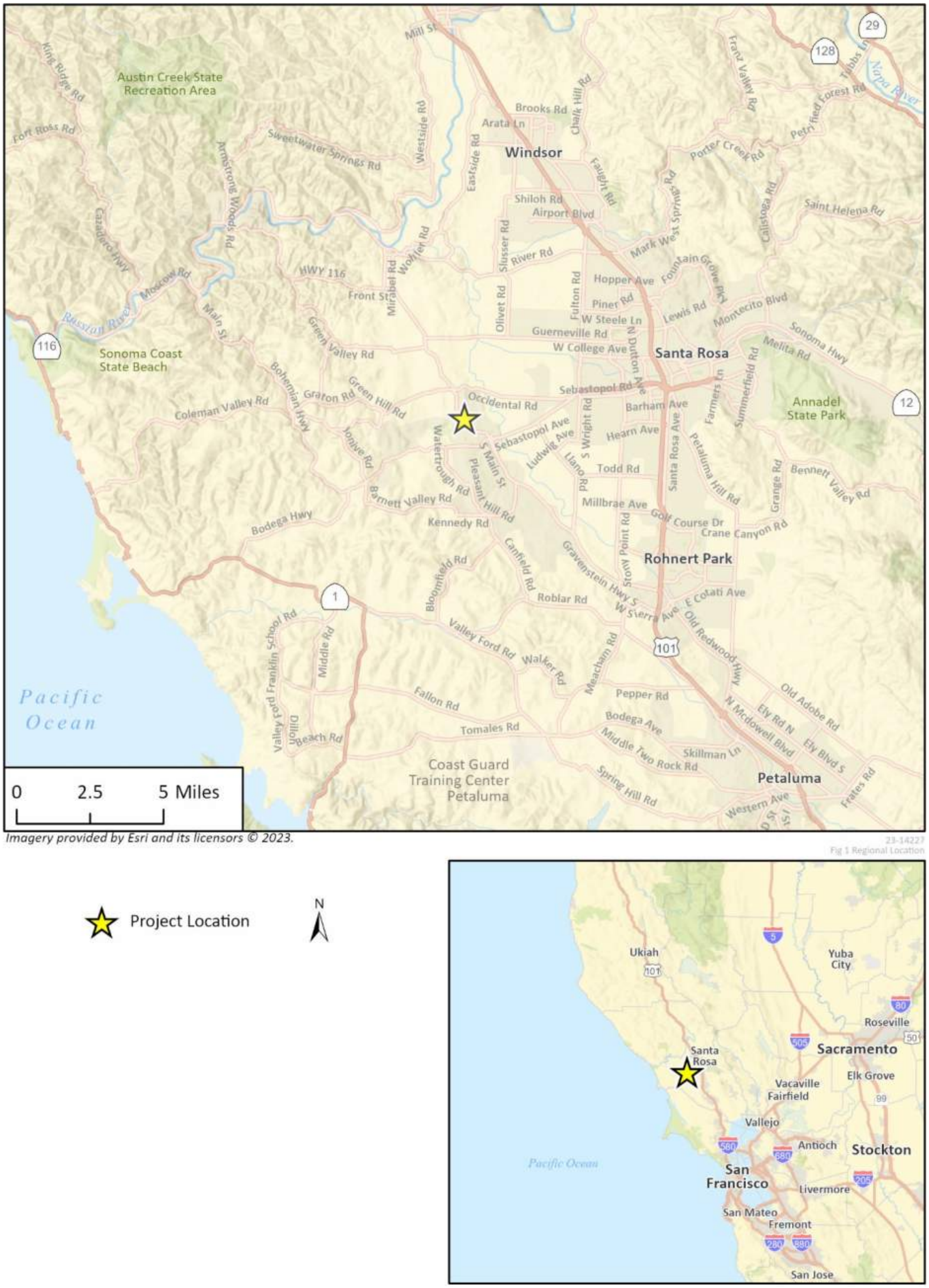

Figure 2-2 Project Location

Imagery provided by Microsoft Bing and its licensors © 2023; City of Sebastopol Geocortex Viewer, 2023.

23-14227
Fig 2 Project Location

2.4 Existing Site Characteristics

2.4.1 Current Land Use Designation and Zoning

The project site is designated as Office/Light Industrial (OLI) in the 2016 City of Sebastopol General Plan. The General Plan OLI designation is intended "to promote well planned, integrated business parks, which will serve as major employment center within the community" (Sebastopol 2015). The Office/Light Industrial designations only apply to sites of three (3) acres or larger. Residential uses are allowed at a density of 12.1 to 25 units per acre as a secondary use to the primary office/light industrial uses allowed in this land use designation (Sebastopol 2015).

The project site is designated as Office/Light Industrial (OLM) by the City of Sebastopol Zoning Ordinance. According to Section 17.25.010 of the Sebastopol Municipal Code (SMC), the purpose of the OLM District is to implement the "Office/Light Industrial" land use category of the General Plan and to provide areas for well-planned, integrated business parks that may include office and related uses. Section 17.25.020 of SMC lists the allowed uses of the OLM district which includes R7-Multifamily Residential (12.1-25 du/ac) with Planning Commission review.

2.4.2 Surrounding Land Uses

The project site is in a neighborhood characterized by a mix of uses including residential, educational, commercial, and recreational. The Sebastopol Charter School and single-family residential uses are located north of the site, across the West County Trail. Uses to the east include primarily single-family neighborhoods as well as the West County Trail. South of the project site uses are comprised of primarily commercial uses, including an automotive store, mixed commercial and residential sites, and several single-family residences. The existing office buildings (1003-1007 Gravenstein Highway North), known as the O'Reilly Media Center, directly abuts the site to the west, and a mix of residential uses are located further west, across Gravenstein Highway North.

2.4.3 Existing Project Site Conditions

The project site is currently undeveloped but includes existing vegetation and mature trees. An informal pedestrian pathway bisects the site to connect the existing O'Reilly Media Center parking lot to the West County Trail, allowing use of the trail. To the east, the site is directly adjacent to the West County Trail, a paved trail that links Sebastopol with areas to the Northwest, including Graton and Forestville, and connects in downtown Sebastopol to the Joe Rodota Trail, which connect downtown Santa Rosa and Sebastopol. These trails run parallel to Highway 116 to the North of the site and along Highway 12 from eastern Sebastopol to Santa Rosa and is a popular route for cyclists and pedestrians (Sonoma County 2023). The portion directly east of the site is a Class II route and ends at Analy High School. The project site is generally flat and includes numerous mature trees across the parcel (Figure 2-3). The elevation is approximately 200 feet above mean sea level.

Figure 2-3 Existing Site Conditions

The eastern project site boundary looking west

West of the O'Reilly Media Center looking southeast

The northwestern project site boundary looking south

Existing trees on the site, looking east

2.5 Project Description

2.5.1 Proposed Parcel Changes

The project would require the City's approval of a conditional use permit, site development review, and vesting tentative tract map. In addition, the project applicant proposes the use of a State Density Bonus to allow for a waiver to increase the building height to three stories.

2.5.2 Proposed Residential Development

The proposed project would construct 80 solar all-electric, three-story townhome-style condominiums, with the potential for up to 16 Americans with Disability Act (ADA) accessible accessory dwelling units (ADUs). Table 2-1 provides a summary of the proposed development.

Table 2-1 Proposed Residential Development Summary

Feature	Details
Townhome Project Characteristics	
Residential area	69,317 square feet
Floor Area Ratio (FAR)	1.53[1]
Density	Allowed: 12.1 to 25 dwelling units/acre Proposed: 13.1 dwelling units/acre
Building Height	Allowed: 30 feet and 2 stories Proposed: 40 feet +/- and 3 stories with Density Bonus Waiver
Proposed Dwelling Units	
Three-Bedroom	22 units
Three-Bedroom (with an optional fourth bedroom)	29 units
Three-Bedroom (with an optional elevator and/or fourth bedroom)	13 units
Three-Bedroom (with an optional ADU or fourth bedroom)	16 units
Total Units	**80 units, with a maximum of 16 ADUs**
Proposed Parking	
Garage Parking Within Townhomes	160 spaces
Standard Surface Parking	41 spaces with 10 percent (6 spaces) of electric vehicle charging parking spaces
Compact Surface Parking	17 spaces
Total	**218 spaces**
Total Bicycle Parking Spaces	**96 (80 in garages and 16 in on-site bicycle racks)**

Feature	Details
Proposed Open Space	
Common Open Space	107,200 square feet (1,340 square feet per dwelling unit)
Private Open Space (at grade)	216 square feet per dwelling unit
Private Open Space (balconies)	75-230 square feet per dwelling unit

[1] Calculated as the total allowed lot coverage (106,333 square feet) divided by the total ground floor footprint proposed (69,317 square feet)

The proposed 80 units (and potential ADUs) would be distributed throughout 20 buildings. The buildings would be distributed in blocks of three to eight townhomes per building throughout the site. The homes would range from two to four bedrooms and include options for up to 16 accessible ground floor ADUs. Select residences would have the option for personal elevators and would provide additional ADA accessibility. The project includes accessible/adaptable features in each building with an accessible path of travel to connect all buildings. Each residential unit would be three stories and would include a two-car garage and bedroom or ADU on the first floor, kitchen and living spaces on the second floor, and additional bedrooms at the third floor. Figure 2-4 shows the proposed site plan and Figure 2-5 shows the proposed project elevations.

2.5.3 Circulation, Access, and Parking

Access to the proposed residential units and garages would be taken from newly constructed private streets between the buildings, which would connect to Gravenstein Highway North. Access to the site via Gravenstein Highway North would be provided by two new inlet and outlet points at the northwest and southwest portions of the site on either side of the existing O'Reilly Media Center site. The northwest entry point would use the existing intersection at Mill Station Road, and the southwest entry point would provide access through one new curb cut connecting to Gravenstein Highway. The project would include a total of 160 parking spaces in garages and 58 surface spaces across the site.

Pedestrian and bicycle access to the buildings would be provided via the new internal roadways. The project would include construction of landscaped internal walkways throughout the site, including a new, enhanced 6-foot-wide pedestrian pathway to connect the West County Trail to Gravenstein Highway along the south border of the site; a bicycle repair station is proposed at the same location. The project would include 96 bicycle parking spaces, with 80 long-term spaces located in each residential garage and 16 spaces in onsite bicycle racks.

2.5.4 Landscaping and Open Space

There are currently 133 trees within the project site, and the proposed project would involve the removal of 22 trees while preserving the remaining 111 trees primarily along the perimeter of the site. An existing large, mature coast live oak tree would be retained at the primary entrance to the project entry. Existing oak trees and redwoods would be preserved throughout the site. Additional trees, such as native maples, madrone and dogwood, are proposed to create onsite ecosystems that attract birds and butterflies. Proposed landscaping would include new plantings throughout the open spaces, including the paseo, at the setbacks along drive aisles, roadways, and streets, and surrounding the proposed buildings. Other amenities, including gardens, active and passive seating areas, children's play areas, and a meditation hammock garden are also proposed.

To treat stormwater, the proposed project would include flow-through planters and permeable pavement throughout the project site. Several bioretention facilities and swales are proposed along the perimeter of the site including the north, west, and southwestern boundaries of the site.

Figure 2-4 Proposed Project Site Plan

Source: William Hezmalhalch Architects, INC. DBA WHA., 2023

Figure 2-5 Proposed Building Elevations

Source: William Hezmalhalch Architects, INC. DBA WHA., 2023

2.5.5 Building and Architecture

The buildings are proposed to have a modern agrarian aesthetic with steep pitched roofs, and materials like lapped and board-and-batten siding.

2.5.6 Construction

Construction would occur over approximately 31 months. Phase I is anticipated to start in June 2024 and finish in June 2026. Construction would take place within the hours of 7:00 a.m. to 8:00 p.m., Monday through Friday. Phase II is expected to begin in March 2025 and end in February 2027. Site preparation across both phases is anticipated to result in approximately 9,520 cubic yards of cut and fill soil which would be balanced on site. Roughly 2,092 cubic yards and 1,566 cubic yards of soil are anticipated to be imported for Phase I and II, respectively. Some of the soil on the project site was impacted by contamination (refer to Section 4.7, *Hazards and Hazardous Materials*, for more information), and would be buried on-site under six feet of clean fill material. Total construction activities would involve the use and operation of aerial lifts, backhoes, cement and mortar mixers, compactors, cranes, dozers, forklifts, graders, loaders, paving equipment, rollers, scrapers, skid steer loaders, and tractors.

2.5.7 Utilities

The City of Sebastopol Public Works would provide water, stormwater, and wastewater collection, treatment, and disposal to the project site. Electricity would be provided by Pacific Gas and Electric (PG&E). Solid waste and recycling services for the site are provided by Recology Sonoma Marin. Police and fire protection services would be provided by the City of Sebastopol. The proposed project includes onsite drainage improvements with bioretention facilities (vegetated buffers and bioswale) and a storm drain network. The inlet and overflow structures of an existing detention pond for the adjacent office park would be modified to detain and control combined drainage from the office park and proposed project.

2.6 Project Objectives

The objectives for the proposed project are to:

1. Develop diverse residential uses, including ADUs, that add diversity to the City of Sebastopol's ownership housing supply and meet a variety of residents' needs by encouraging inherent affordability and providing housing opportunities for households at a variety of income levels and life stages.
2. Develop a well-designed ownership residential townhome project that includes accessible and adaptable features in every building to provide ADA accessibility beyond what is required by the building code.
3. Construct a single, cohesive development consisting of high-quality, contemporary urban design that respects and relates well to its surroundings and respects the urban forest that will remain.
4. Bolster the connection between the community and the West County Trail through the preservation of existing pathways and ensuring continued use of the trail.
5. Achieve the streamlined and efficient processing and approval of the project including benefits available to developments that include affordable housing consistent with the State Density Bonus Law.

2.7 Required Approvals

The proposed project would require approval of the following entitlements by the City of Sebastopol City Council:

- Conditional Use Permit for 80 townhouse units within the OLM zoning district
- A Vesting Tentative Map
- State Density Bonus law waiver to increase building height from two stories to three stories
- Site Design Review
- Removal of 22 existing onsite trees

The Department of Toxic Substances Control (DTSC) is a responsible agency. DTSC is responsible for approving the Soil Management Plan (SMP) for the project prior to construction (grading) activities at the project site.

2.8 California Native American Tribal Consultation

On June 27, 2023, the City of Sebastopol contacted California Native American Tribal governments by sending an Assembly Bill (AB) 52 notification letter via certified mail to ten Native American tribal contacts. Under AB 52, Native American tribes have 30 days to respond and request further project information and request formal consultation. The City received one response from the Kashia Band of Pomo Indians of Stewarts Point which stated that the tribe had no comments or concerns. To date, the City has not received any additional responses under AB 52.

3 Environmental Setting

This section provides a general overview of the environmental setting for the project. More detailed descriptions of the environmental setting for each environmental issue area can be found in Section 4, *Environmental Impact Analysis*.

3.1 Regional Setting

The project is located within the City of Sebastopol city limits. Figure 2-1 in Section 2, *Project Description*, shows the regional location of the project site. The City of Sebastopol (city) city limits and sphere of influence (SOI) encompass approximately 1,400 acres and are located in Western Sonoma County, approximately 15 miles east of the Pacific Ocean and 52 miles north of San Francisco. The city is south of the unincorporated community of Graton, east of the unincorporated community of Freestone, and west of the city of Santa Rosa.

The city is largely built out and is at the crossroads of two State Highways, SR-116 and SR-12. The nearest freeway US-101, is located approximately 6.7 miles east of the project site. The city is also served by the Sonoma County Transit bus system.

The Mediterranean climate of the region produces moderate temperatures year-round, with rainfall concentrated in the winter months. Although air quality in the area has steadily improved in recent years, Sonoma County remains a nonattainment area for ozone (urban smog) and PM-2.5 (EPA 2023).

3.2 Project Site Setting

The project site encompasses approximately 6.1 acres across two parcels located at 1009-1011 Gravenstein Highway North, on the east side of Gravenstein Highway North southeast of its intersection with Mill Station Road. The project site is currently undeveloped but includes existing vegetation and mature trees. An informal pedestrian pathway bisects the site to connect the existing O'Reilly Media Center parking lot to the West County Trail, allowing use of the trail. To the east, the site is directly adjacent to the West County Trail, a paved trail that links Sebastopol with areas to the Northwest, including Graton and Forestville, and connects in downtown Sebastopol to the Joe Rodota Trail, which connect downtown Santa Rosa and Sebastopol. These trails run parallel to Highway 116 to the North of the site and along Highway 12 from eastern Sebastopol to Santa Rosa and is a popular route for cyclists and pedestrians. The project site is generally flat and includes numerous mature trees across the parcel. The elevation is approximately 200 feet above mean sea level.

The project site is in a neighborhood characterized by a mix of uses including residential, educational, commercial, and recreational. The Sebastopol Charter School and single-family residential uses are located north of the site, across the West County Trail. Uses to the east include primarily single-family neighborhoods as well as the West County Trail. South of the project site uses are comprised of primarily commercial uses, including an automotive store, mixed commercial and residential uses, and several single-family residences. The existing O'Reilly Media Center directly abuts the site to the west, and a mix of residential uses are located further west, across Gravenstein

Highway North. Figure 2-2 in Section 2, *Project Description*, shows the project site's immediate location and selected nearby land uses.

The project site is designated as Office/Light Industrial (OLI) in the 2016 City of Sebastopol General Plan and is zoned as Office/Light Industrial (OLM) by the City of Sebastopol Zoning Ordinance.

3.3 Cumulative Development

In addition to the specific impacts of individual projects, CEQA requires EIRs to consider potential cumulative impacts of the proposed project. CEQA defines "cumulative impacts" as two or more individual impacts that, when considered together, are substantial or will compound other environmental impacts. Cumulative impacts are the combined changes in the environment that result from the incremental impact of development of the proposed project and other nearby projects. For example, traffic impacts of two nearby projects may be less than significant when analyzed separately but could have a significant impact when analyzed together. Cumulative impact analysis allows the EIR to provide a reasonable forecast of future environmental conditions and can more accurately gauge the effects of a series of projects.

CEQA requires cumulative impact analysis in EIRs to consider either a list of planned and pending projects that may contribute to cumulative effects or a forecast of future development potential. Currently planned and pending projects in Sebastopol are listed in Table 3-1. These projects are considered in the cumulative analyses in Section 4, *Environmental Impact Analysis*.

Table 3-1 Cumulative Projects List

Project No.	Project Location[1]	Land Use	Status
City of Sebastopol			
1	7621 Healdsburg Avenue	Townhomes	Under Review
2	7631 Healdsburg Avenue	Residential	Under Construction
3	845 Gravenstein Hwy North	Low-Income Residential	Under Review
4	7950 Bodega Avenue	Townhomes	Approved
5	7716/7760 Bodega Avenue	Apartments	Under Construction
6	333 N Main St	Townhomes	Approved
7	6828 Depot Street	Hotel	Approved
8	6807 Sebastopol Avenue	Commercial	Approved
9	6751 Sebastopol Ave	Supported Living	Approved

[1] Cumulative project details were sourced from the City of Sebastopol's website "Building & Development Projects" page. https://ci.sebastopol.ca.us/our-community/buildingprojects/ and email correspondence with the City of Sebastopol.

4 Environmental Impact Analysis

This section discusses the possible environmental effects of the project for the specific issue areas that were identified through the scoping process as having the potential to experience significant effects. A "significant effect" as defined by the *CEQA Guidelines* §15382:

> 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 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.

The assessment of each issue area begins with a discussion of the environmental setting related to the issue, which is followed by the impact analysis. In the impact analysis, the first subsection identifies the methodologies used and the "significance thresholds," which are those criteria adopted by the City and other agencies, universally recognized, or developed specifically for this analysis to determine whether potential effects are significant. The next subsection describes each impact of the proposed project, mitigation measures for significant impacts, and the level of significance after mitigation. Each effect under consideration for an issue area is separately listed in bold text with the discussion of the effect and its significance. Each bolded impact statement also contains a statement of the significance determination for the environmental impact as follows:

- **Significant and Unavoidable**. An impact that cannot be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires a Statement of Overriding Considerations to be issued if the project is approved per §15093 of the CEQA Guidelines.
- **Less than Significant with Mitigation Incorporated**. An impact that can be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires findings under §15091 of the CEQA Guidelines.
- **Less than Significant**. An impact that may be adverse but does not exceed the threshold levels and does not require mitigation measures. However, mitigation measures that could further lessen the environmental effect may be suggested if readily available and easily achievable.
- **No Impact.** The proposed project would have no effect on environmental conditions or would reduce existing environmental problems or hazards.

Following each environmental impact discussion is a list of mitigation measures (if required) and the residual effects or level of significance remaining after implementation of the measure(s). In cases where the mitigation measure for an impact could have a significant environmental impact in another issue area, this impact is discussed and evaluated as a secondary impact. The impact analysis concludes with a discussion of cumulative effects, which evaluates the impacts associated with the proposed project in conjunction with other planned and pending developments in the area listed in Section 3, *Environmental Setting*.

The Executive Summary of this EIR summarizes all impacts and mitigation measures that apply to the proposed project.

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4.1 Aesthetics

The analysis in this section describes current visual conditions in and around the project area within the City of Sebastopol and evaluates the potential aesthetic and visual impacts of the project, including impacts to scenic vistas, scenic resources, visual character and quality, and light and glare.

4.1.1 Environmental Setting

The City of Sebastopol is located in the northern portion of the nine-county Bay Area. The project site is located in the northern portion of the city in a developed area of the city. Sebastopol is considered to be semi-rural and offers a mix of residential, commercial, and agricultural uses. The project site is in a neighborhood characterized by a mix of uses including residential, educational, commercial, and recreational. The Sebastopol Charter School and single-family residential uses are located north of the site, across the West County Trail. Uses to the east include primarily single-family neighborhoods as well as the West County Trail. South of the project site uses are comprised of primarily commercial uses, including an automotive store, and several single-family residences.

A three-story office park directly abuts the site to the west. A mix of one-story residential buildings with neutral finishes are located further west, across Gravenstein Highway North, and the visual quality of this residential area and its surroundings is considered average. The mix of ranch-style, Victorian, and modern residential buildings and commercial building styles are typical for the area. To the east, the site is directly adjacent to the West County Trail, a paved trail that links Sebastopol with areas to the Northwest, including Graton and Forestville, and connects in downtown Sebastopol to the Joe Rodota Trail, which connect downtown Santa Rosa and Sebastopol.

The project site is generally flat and undeveloped and is characterized by mature trees. Views from the project site include the mature trees on and abutting the project site, the West County Trail, adjacent residential uses, and the adjacent office park. The project site is located directly east of a portion of Highway 116 which is designated as a state scenic highway. Public views of the project site are available from State Route 116 and Hurlbut Avenue. However, views of the site are minimized due to intervening development directly abutting State Route 116 and trees along the State Route. The City of Sebastopol identifies scenic views within the city as Laguna de Santa Rosa, Atascadero Creek, and the hills west of Sebastopol (Sebastopol 2016). These scenic views are not visible from the project site.

4.1.2 Regulatory Setting

a. State

California Scenic Highways Program

The California Scenic Highway Program, established in 1963, identifies and designates certain highways throughout the State which require special conservation treatment in relation to surrounding land use development. Caltrans manages the State Scenic Highway Program and defines a scenic highway as any freeway, highway, road, or other public right-of-way, that traverses an area of exceptional scenic quality. Suitability for designations as a State scenic highway is based on the vividness, intactness, and unity of their view corridors, as described in Caltrans' Scenic Highway Guidelines (Caltrans 2008):

- **Vividness** is the extent to which the landscape is memorable. This is associated with the distinctiveness, diversity, and contrast of visual elements. A vivid landscape makes an immediate and lasting impression on the viewer.
- **Intactness** is the integrity of visual order in the landscape and the extent to which the natural landscape is free from visual intrusions (e.g., buildings, structures, equipment, grading).
- **Unity** is the extent to which development is sensitive to and visually harmonious with the natural landscape.

California Green Building Code

The California Green Building Code, CCR Part 11, Title 24, Section 5.106.8, stipulates that new project site lighting must conform to standards that keep light generated on site from leaving the site by using reflectors, shields, screen walls, and any other method which complies with the Code's intent to limit light pollution.

b. Local

Sonoma 116 Scenic Highway Corridor Study

In 1983, the State legislature passed Assembly Bill (AB) 1026, which added State Route 116 from Highway 101 near Cotati to State Route 1 near Jenner in Sonoma County to the Master Plan of the State Highways Eligible for Scenic Highway Designation. The County had already designated State Route 116 as a scenic corridor, and following the passage of AB 1026, the Sonoma County Board of Supervisors passed a resolution to request that Caltrans conduct studies leading to designation of the route as an Official State Scenic Highway. The ensuing report Caltrans published offers visual quality assessments for scenic corridor segments that include areas where State Route 116 passes.

Sebastopol General Plan

The City of Sebastopol General Plan has developed goals, objectives, and policies related to community design and scenic resources. These include:

Goal CD 1: Preserve and Enhance Sebastopol's Unique Character, Design, and Sense of Place as a Small, Compact Town

> **Policy CD 1-1:** Ensure that new development is constructed in a manner consistent with the City's Design Guidelines, and any design guidelines for specific areas or types of development.
>
> **Policy CD 1-2:** Ensure that new residential and commercial development is sensitive to the surrounding architecture, topography, landscaping, character, scale, and ambiance of the surrounding neighborhood.
>
> **Policy CD 1-3:** Discourage repetitive designs in residential and commercial areas, while establishing a cohesive visual relationship between structures and their surroundings.
>
> **Policy CD 1-7**: Promote a compact urban form and infill development with increased densities to be located in areas that are readily accessible by pedestrians and bicyclists, served by transit, and allow for convenient access to daily services.
>
> **Policy CD 1-8**: Support and encourage new commercial development to include residential components.

Policy CD 1-12: Require the design of new residential development to be consistent with the City's design guidelines, to ensure that new development contributes to the small town character of Sebastopol.

Goal COS 11: Preserve and Enhance Scenic Views of the Laguna de Santa Rosa, Atascadero Creek, the Hills to the West of Sebastopol, and Other Natural Resources within the Sebastopol Planning Area

Policy COS 11-1: Consider existing scenic resources, including views of the Laguna de Santa Rosa, local hills, ridgelines, and open space areas surrounding the City, as resources critical to Sebastopol's community identity and character.

Policy COS 11-2: Protect Sebastopol's ridgelines (hill tops and hillsides with slopes of 15 percent or greater) from erosion, slope failure, and development.

Policy COS 11-3: Preserve the topography of Sebastopol's hills by prohibiting unnecessary leveling/grading activities prior to site-building on hillsides.

Policy COS 11-4: Preserve and protect prominent views of scenic resources, including the Laguna de Santa Rosa, local hills, ridgelines, and open space areas surrounding the City, and consider visual access and view corridors when reviewing development proposals. Policy

Policy COS 11-5: Regulate development on hillsides with slopes of 15 percent or greater and ridgelines where structures would interrupt the skyline.

Policy COS 11-6: Encourage structures within new developments on substantially sloped sites to step with the slope of the site. Absorb site topography through the use of split-level designs.

Policy COS 11-7: Restrict outdoor light and glare from development projects to retain the quality of night skies by minimizing light pollution.

Policy COS 11-8: All outdoor lighting shall be constructed with full shielding and/or recessed to reduce light trespass to adjoining properties and to reduce illumination of the night sky. Each fixture shall be directed downward and away from adjoining properties and public rights-of-way, so that no light fixture directly illuminates an area outside of the site.

4.1.3 Impact Analysis

a. Significance Thresholds and Methodology

This assessment of aesthetic impacts involves qualitative analysis. Reactions to the same aesthetic conditions vary according to the viewer. This evaluation compares the existing visual character of the project site and vicinity (as described above in Section 4.1.2, *Setting*) to the visual environment after implementation of the proposed project.

According to Appendix G of the *CEQA Guidelines*, an impact related to aesthetics is considered significant if development under the proposed project would result in one or more of the following conditions:

1. Have a substantial adverse effect on a scenic vista
2. Substantially damage scenic resources, including, but not limited to, unique mature trees, unique rock outcroppings, and historic buildings within a state scenic highway

3. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings (public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality
4. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area

b. Project Impacts and Mitigation Measures

Threshold:	Would the project have a substantial adverse effect on a scenic vista?

Impact AES-1 THE PROPOSED PROJECT WOULD NOT HAVE A SUBSTANTIAL ADVERSE IMPACT ON A SCENIC VISTA. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Scenic vistas are considered expansive views from elevated positions, such as those from a roadway in the mountains, or views provided from a public place where the landscape is visible into the distance (e.g., looking at mountains across a field with little intervening development or vegetation). As discussed in Section 4.11, *Environmental Setting*, the City of Sebastopol identifies scenic views within the city as Laguna de Santa Rosa, Atascadero Creek, and the hills west of Sebastopol. None of these areas are within the project vicinity. The project site does not provide views through or from the site of scenic vistas that would be adversely affected as a result of development of the project.

Therefore, the proposed project will not have a substantial adverse impact on a scenic vista or surrounding views of the project site. Impacts would be less than significant.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold:	Would the project substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Impact AES-2 THE PROPOSED PROJECT WOULD NOT SUBSTANTIALLY DAMAGE SCENIC RESOURCES INCLUDING TREES, ROCK OUTCROPPINGS, OR HISTORIC BUILDINGS WITHIN VIEW OF A STATE SCENIC HIGHWAY. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION.

A scenic highway is generally defined by Caltrans as a public highway that traverses an area of outstanding scenic quality, containing striking views, flora, geology, or other unique natural attributes. A highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. The City of Sebastopol offers a variety of scenic views, many of which are visible from roadways. State Route 116 from State Route 1 to the south city limit of Sebastopol (post mile 0.0 to 27.817) is officially designated as a state scenic highway (Caltrans 2019). This segment near the project site is 27.8 miles long and was designated on September 20, 1988. This highway segment includes travel along the Russian River, and passes a historic resort area, redwood forests, and eucalyptus groves. Additionally, the portion of State Route 116 southeast of the project and Sebastopol city limits is eligible for designation.

A scenic corridor is the view from the road that may include a distant panorama and/or the immediate roadside area. A scenic corridor encompasses the outstanding natural features and landscapes that are considered scenic. It is the visual quality of the man-made or natural environments within a scenic corridor that are responsible for its scenic value. Commonly, the physical limits of a scenic corridor are broken down into foreground views (zero to one quarter mile) and distant views (over one quarter mile). In addition to distinct foreground and distant views, the visual quality of a scenic corridor is defined by special features such as focal points, transition areas, and gateways. Sonoma County has designated State Route 116 as a scenic corridor.

The project site is set back from State Route 116 approximately 150 feet at the closest point, and intervening development, such as O'Reilly Media Center, occurs to the west of the site and would break up views of the proposed project. Trees directly abutting State Route 116 to the east would remain and would also serve to break up views of the project site along State Route 116. Though the proposed project would be located east of State Route 116, it would be subject to the SMC Chapter 17.450 which would require Design Review of the proposed project prior to its approval. Development of the project would also be required to comply with SMC Chapter 16.40, which would require that the project would utilize landscaping to minimize views of the project site from State Route 116. While the site would be minimally visible from State Route 116, intervening development and landscaping would serve to minimize views of the project site. Impacts would be less than significant.

There are no rock outcroppings or historic buildings on or adjacent to the project site. As discussed in Section 4.3, *Biological Resources*, a total of 133 trees greater than six inches occur on the project site. Twenty-two (22) protected trees would be removed as a result of project implementation. Removed species include coast live oak, Douglas fir, and coast redwood. Existing oak trees and redwoods would be preserved to the maximum extent possible. The project applicant would be required to comply with the Sebastopol Municipal Code Chapter 8.12, *Tree Protection*, which would include a review of tree removal plans, landscape plans, and specification of a tree replacement ratio by the Planning staff or the City Arborist during the project design review. Pending approval, removed trees must be replaced with an approved tree species on the approved tree List, as described in Mitigation Measure BIO-2. The project proposes planting replacement trees on site including big leaf maple, madrone, sycamore, and California bay. Through approval of the tree removal permit and corresponding tree mitigation requirements, the project would not conflict with local policies or ordinances regarding trees. Impacts would be less than significant.

Mitigation Measures

Mitigation Measure BIO-2 would apply.

Significance After Mitigation

Mitigation Measure BIO-2 would ensure that Chapter 8.12 of the municipal code is implemented and that the project would not conflict with local policies or ordinances regarding trees, and the impact would be reduced to a level of less than significant.

Threshold:	Would the project, in non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Impact AES-3 THE PROPOSED PROJECT IS IN A NON-URBANIZED AREA AND WOULD NOT SUBSTANTIALLY DEGRADE THE EXISTING VISUAL CHARACTER OR QUALITY OF PUBLIC VIEWS OF THE SITE AND ITS SURROUNDINGS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Although the site is not currently developed, the project is surrounded by residential and commercial land uses. While development of the site would not result in substantial changes to the visual character of the project area, it would result in development of a previously undeveloped site. As such, implementation of Sebastopol Design Guidelines and compliance with SMC Chapters 17.450 and 16.40 would ensure that development would be consistent with design guidelines through design review and would ensure that the project would be consistent with existing surrounding development.

As discussed in Section 4.11, *Environmental Setting*, public views of the project site are available from State Route 116. However, views of the site are minimized due to intervening development directly abutting State Route 116 and trees along the State Route. The project site is designated as Office/Light Industrial in the City's General Plan and zoned as Office/Light Industrial, which would allow for development of residential uses in the area with approval of a Conditional Use Permit. The project, which requires approval of a Conditional Use Permit, would be consistent with existing land use designation and zoning. Therefore, the project would not constitute a substantial degradation of the existing character or visual quality of the project site because the proposed development would be visually consistent with surrounding residential and commercial areas.

In addition, the project would comply with the height limitations and setback requirements in the SMC, which would ensure the sensitive design and siting of future residences in a way that is visually compatible with the development scale and style of the surrounding area.

Therefore, the proposed project would not substantially degrade the existing visual character or quality of the site or surrounding area. Therefore, this impact would be less than significant.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold:	Would the project create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?

Impact AES-4 THE PROPOSED PROJECT WOULD NOT CREATE A NEW SOURCE OF SUBSTANTIAL LIGHT OR GLARE THAT WOULD ADVERSELY AFFECT DAYTIME OR NIGHTTIME VIEWS IN THE AREA. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The project site is undeveloped and does not have existing sources of light or glare. Existing sources of light and glare in the project area are primarily associated with residential and commercial uses nearby, and streetlights lining State Route 116 along the northern edge of the site. Sources of light from the proposed project would include exterior and interior building lighting, path lighting, outdoor area lighting, and decorative outdoor lighting. Sources of glare from the project would include windows and reflective building materials. Light and glare can also be affected by the absence of vegetation, because vegetation acts to screen and filter light and soften the intensity of glare.

The proposed project would introduce nighttime light sources associated with lighting of the proposed buildings. In addition, glare associated with on-site residences and associated passenger vehicles could occur on sunny days. Therefore, the project could affect daytime or nighttime views in the area. General Plan Policy COS 11-8 requires all outdoor lighting to be constructed with full shielding and/or recessed to reduce light trespass to adjoining properties and to reduce illumination of the night sky and be directed downward and away from adjoining properties and public rights-of-way, so that no light fixture directly illuminates an area outside of the site. Policy COS 11-8 restricts outdoor lighting and glare from development projects to retain the quality of night skies by minimizing light pollution. However, there are no municipal code requirements that implement the General Plan policies related to outdoor lighting, or the design guidelines regarding site lighting. Therefore, Mitigation Measure AES-4 would be required to reduce impacts to a less than significant level.

Mitigation Measures

AES-4 Lighting Specifications

Exterior lighting installed on the project site must be of low intensity, low glare design, and must be hooded to direct light downward onto the subject parcel and prevent spill-over onto adjacent parcels and must otherwise meet dark night sky requirements. Exterior lighting fixtures must be kept to the minimum number and intensity needed to ensure public safety. Upward directed exterior lighting is prohibited. The final lighting plan must be amended to include identification of all types, sizes, and intensities of wall mounted building lights and landscape accent lighting, and a photometric map must be provided.

Significance After Mitigation

Mitigation Measure AES-4 would implement the requirements of the General Plan and design guidelines to ensure lighting onsite would be directed downward and be of sufficient intensity to reduce lighting impacts to a less than significant level.

4.1.4 Cumulative Impacts

The geographic scope for cumulative aesthetics and visual quality impacts is the City of Sebastopol, specifically including areas that surround the project site. This geographic scope is appropriate because views of the project site and lighting from the proposed project would most affect areas in the immediate vicinity of the project site.

Past, present, and reasonably foreseeable projects would have limited, site-specific impacts on public viewsheds and scenic resources throughout the county. Cumulative projects would be subject to individual design review and environmental review in order to determine impacts to visual resources. Cumulative development would generally result in increased development intensity within scenic vistas, result in increased development within view of a state scenic highway, change the visual character of individual sites, and increase daytime light, nighttime light, and glare from additional reflective surfaces and light sources.

As with the proposed project, cumulative development would be required to adhere to all applicable zoning and development regulations, local regulations designed to result in visually compatible development (through design guidelines and siting requirements) and control light and glare, including applicable SMC sections, the California Green Building Code, and California Scenic Highways Program. Compliance with these requirements would ensure cumulative aesthetics and light and glare impacts would be less than significant.

The proposed project would not have a significant impact on scenic vistas and with implementation of Mitigation Measure BIO-2 aesthetic impacts related to trees would be less than significant. In addition, the project would have no impact on scenic highways due to the distance between the project site and any officially designated routes. The proposed project would be consistent with existing and proposed land uses, and with implementation of Mitigation Measure AES-4, the project would not create significant light or glare that could impact daytime and nighttime views. Because project-specific impacts would be less than significant with mitigation, and because visual resource impacts are generally site-specific, project buildout would not result in a cumulatively considerable contribution to cumulative impacts.

4.2 Air Quality

This section addresses the air emissions generated by construction and operation of the project, including emissions that may lead to odors. The analysis also addresses the consistency of the project with the air quality policies in the Bay Area Air Quality Management District's (BAAQMD) Clean Air Plan and the City of Sebastopol General Plan (General Plan). The analysis of project-generated air emissions focuses on whether the project would cause an exceedance of an ambient air quality standard or BAAQMD significance thresholds. Air emissions related to greenhouse gases are analyzed in Section 4.6, *Greenhouse Gas Emissions*. Calculation model outputs used in the analysis are included in Appendix B.

4.2.1 Setting

a. Climate and Topography

The City of Sebastopol is located in Sonoma County, a subregion of the San Francisco Bay Area Air Basin (SFBAAB). The SFBAAB includes the counties of San Francisco, Santa Clara, San Mateo, Marin, Napa, Contra Costa, and Alameda, along with the southeast portion of Sonoma County and the southwest portion of Solano County. Sonoma County is north of Marin County and Pablo Bay, and west of Napa County.

Due to the proximity of San Francisco Bay and the Pacific Ocean, the climate in the SFBAAB is characterized by warm dry summers and cool moist winters. The nearest weather station data is approximately two miles from the City of Sebastopol in Graton. The average maximum and minimum temperature at this air monitoring site is 83.5 and 56.2 degrees Fahrenheit, respectively. The average annual rainfall at this air monitoring location is 40.74 inches (Western Regional Climate Center 2016).

The major large-scale weather feature controlling climate in Sebastopol is a large high-pressure system located in the eastern Pacific Ocean, known as the Pacific High. During winter months, marine air trapped in the lower atmosphere is often condensed into fog by the cool Pacific Ocean. Stratus-type clouds usually form offshore and move into the area during the evening hours. During winter months, the Pacific High becomes weaker and shifts south, allowing weather systems associated with the polar jet stream to affect the region. Low pressure systems produce periods of cloudiness, strong shifting winds, and precipitation. High-pressure systems are also common in winter, with low-level inversions that produce cool stagnant conditions.

b. Air Pollutants of Primary Concern

The federal and State Clean Air Act (CAA) mandate the control and reduction of certain air pollutants. Under these laws, the United States Environmental Protection Agency (USEPA) and the California Air Resource Board (CARB) have established the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) for "criteria pollutants" and other pollutants, which are discussed in more detail under Section 4.2.2, *Regulatory Setting*. Primary criteria pollutants are emitted directly from a source (e.g., vehicle tailpipe, an exhaust stack of a factory, etc.) into the atmosphere and include carbon monoxide (CO), VOC (volatile organic gases)/reactive organic gases (ROG),[1] nitric oxide (NO_X), particulate matter, sulfur dioxide (SO_2), and lead (Pb). Secondary criteria pollutants are created by atmospheric chemical and photochemical reactions primarily between VOC and NO_X. Secondary pollutants include oxidants, ozone (O_3), and sulfate and nitrate particulates (smog). The characteristics, sources and effects of criteria pollutants are discussed in the following subsections.

Ozone

Ozone (O_3) is a highly oxidative unstable gas produced by a photochemical reaction (triggered by sunlight) between NO_X and VOC. VOC is composed of non-methane hydrocarbons (with specific exclusions), and NO_X is composed of different chemical combinations of nitrogen and oxygen, mainly nitric oxide and nitrogen dioxide (NO_2). NO_X is formed during the combustion of fuels, while VOC is formed during the combustion and evaporation of organic solvents. As a highly reactive molecule, O_3 readily combines with many different atmosphere components. Consequently, high O_3 levels tend to exist only while high VOC and NO_X levels are present to sustain the O_3 formation process. Once the precursors have been depleted, O_3 levels rapidly decline. Because these reactions occur on a regional rather than local scale, O_3 is considered a regional pollutant. In addition, because O_3 requires sunlight to form, it mainly occurs in concentrations considered serious between April and October. People most at risk from O_3 include people with asthma, children, older adults, and people who are active outdoors, especially outdoor workers. In addition, people with reduced intake of certain nutrients, such as vitamins C and E, are at greater risk from O_3 exposure. Depending on the level of exposure, O_3 can cause coughing and a sore or scratch throat; make it more difficult to breathe deeply and vigorously and cause pain when taking a deep breath; inflame and damage the airways; make the lungs more susceptible to infection; aggravate lung diseases such as asthma, emphysema, and chronic bronchitis; and increase the frequency of asthma attacks (USEPA 2023a).

Carbon Monoxide

Carbon Monoxide (CO) is a localized pollutant found in high concentrations only near its source. The primary source of CO, a colorless, odorless, poisonous gas, is automobile traffic's incomplete combustion of petroleum fuels. Therefore, elevated concentrations are usually only found near areas of high traffic volumes. When CO levels are elevated outdoors, they can be of particular concern for people with some types of heart disease. These people already have a reduced ability to get oxygenated blood to their hearts in situations where they need more oxygen than usual. As a result, they are especially vulnerable to the effects of CO when exercising or under increased stress. In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain, also known as angina (USEPA 2023b).

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a by-product of coal, oil, gas or diesel fuel combustion. The primary sources are motor vehicles and industrial boilers, and furnaces. The principal form of NO_x produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2, commonly called NO_x. NO_2 is a reactive, oxidizing gas and an acute irritant capable of damaging cell linings in the respiratory tract. Breathing air with a high concentration of NO_2 can

[1] CARB defines VOC and ROG similarly as, "any compound of carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate," with the exception that VOC are compounds that participate in atmospheric photochemical reactions. For the purposes of this analysis, ROG and VOC are considered comparable in terms of mass emissions, and the term ROG is used in this EIR.

irritate airways in the human respiratory system. Such exposures over short periods can aggravate respiratory diseases leading to respiratory symptoms (such as coughing, wheezing, or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma and children and the elderly are generally at greater risk for the health effects of NO_2 (USEPA 2023c). NO_2 absorbs blue light and causes a reddish-brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of O_3/smog and acid rain.

Particulate Matter

Suspended atmospheric PM_{10} (particular matter with diameter of 10 microns or less) and $PM_{2.5}$ (particulate matter with diameter of 2.5 microns or less) are comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes, and mist. Both PM_{10} and $PM_{2.5}$ are emitted into the atmosphere as by-products of coal, gas, or diesel fuel combustion and wind erosion of soil and unpaved roads. The atmosphere, through chemical reactions, can form particulate matter. The characteristics, sources, and potential health effects of PM_{10} and $PM_{2.5}$ can be very different. PM_{10} is generally associated with dust mobilized by wind and vehicles. In contrast, $PM_{2.5}$ is generally associated with combustion processes and formation in the atmosphere as a secondary pollutant through chemical reactions. PM_{10} can cause increased respiratory disease, lung damage, cancer, premature death, reduced visibility, surface soiling. For $PM_{2.5}$, short-term exposures (up to 24-hours duration) have been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days. These adverse health effects have been reported primarily in infants, children, and older adults with preexisting heart or lung diseases (CARB 2023a).

Sulfur Dioxide

Sulfur Dioxide (SO_2) is included in a group of highly reactive gases known as “oxides of sulfur.” The largest sources of SO_2 emissions are from fossil fuel combustion at power plants (73 percent) and other industrial facilities (20 percent). Smaller sources of SO_2 emissions include industrial processes such as extracting metal from ore and burning fuels with a high sulfur content by locomotives, large ships, and off-road equipment. Short-term exposures to SO_2 can harm the human respiratory system and make breathing difficult. People with asthma, particularly children, are sensitive to these effects of SO_2 (USEPA 2023d).

Lead

Lead (Pb) is a metal found naturally in the environment, as well as in manufacturing products. The major sources of Pb emissions historically have been mobile and industrial. However, due to the USEPA ’s regulatory efforts to remove Pb from gasoline, atmospheric Pb concentrations have declined substantially over the past several decades. The most dramatic reductions in Pb emissions occurred before 1990 due to the removal of Pb from gasoline sold for most highway vehicles. Pb emissions were further reduced substantially between 1990 and 2008, with reductions occurring in the metals industries at least partly due to national emissions standards for hazardous air pollutants (USEPA 2014). As a result of phasing out leaded gasoline, metal processing is currently the primary source of Pb emissions. The highest Pb level in the air is generally found near Pb smelters. Other stationary sources include waste incinerators, utilities, and Pb-acid battery manufacturers. Pb can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and cardiovascular system depending on exposure. Pb exposure also affects the oxygen-carrying capacity of the blood. The Pb effects most likely encountered in current populations are neurological in children. Infants and young children are susceptible to Pb exposures, contributing to behavioral problems, learning deficits, and lowered IQ (USEPA 2023e).

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are airborne substances and a diverse group of air pollutants that may cause or contribute to an increase in deaths or serious illness, or that may pose a present or potential hazard to human health. TACs include both organic and inorganic chemical substances that may be emitted from a variety of common sources, including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. One of the main sources of TACs in California is diesel engine exhaust that contains solid material known as diesel particulate matter (DPM). More than 90 percent of DPM is less than one micron in diameter (about 1/70th the diameter of a human hair) and thus is a subset of $PM_{2.5}$. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lungs (CARB 2023a).

TACs are different than criteria pollutants because ambient air quality standards have not been established for TACs. TACs occurring at extremely low levels may still cause health effects and it is typically difficult to identify levels of exposure that do not produce adverse health effects. TAC impacts are described by carcinogenic risk and by chronic (i.e., long duration) and acute (i.e., severe but of short duration) adverse effects on human health. People exposed to TACs at sufficient concentrations and durations may have an increased chance of getting cancer or experiencing other serious health effects. These health effects can include damage to the immune system, as well as neurological, reproductive (e.g., reduced fertility), developmental, respiratory, and other health problems (USEPA 2023f).

Current Air Quality

CARB operates a network of air quality monitoring stations throughout Sonoma County. The monitoring stations aim to measure ambient concentrations of pollutants and determine whether ambient air quality meets the California and federal standards. The closest monitoring station to the project site is the Sebastopol-103 Morris Street, located at 103 Morris Street, approximately one mile southeast of the project site. The nearest monitoring station for PM_{10} measurements is located approximately 10.5 miles northwest of the project site at Church and First Streets, Guerneville. Table 4.2-1 indicates the number of days each federal and State standard were exceeded. As shown, hourly O_3 measurements exceeded the State standard in 2021. PM_{10} measurements exceeded the State and federal standards in 2020 and 2021. In addition, $PM_{2.5}$ measurements exceeded the federal standards in 2020. No other State or federal standards were exceeded at these monitoring stations. Since SO_2 is in attainment with the SFBAAB region, it is not monitored at the nearest air monitoring stations and therefore ambient air quality is not reported for this pollutant.

Table 4.2-1 Representative Annual Ambient Air Quality Data

Pollutant	2020	2021	2022
Ozone (ppm), Highest 1-Hour[1]	0.068	0.071	0.064
Number of days above CAAQS (>0.09 ppm)	0	0	0
Ozone (ppm), Highest 8-Hour Average[1]	0.058	0.063	0.055
Number of days above NAAQS and CAAQS (>0.070 ppm)	0	0	0
Carbon Monoxide (ppm), Highest 8-Hour Average[1]	1.78	1.83	0.88
Number of days above CAAQS or NAAQS (>9.0 ppm)	0	0	0
Nitrogen Dioxide (ppm), Highest 1 Hour[1]	0.036	0.026	0.031
Number of days above CAAQS (>0.180 ppm)	0	0	0
Number of days above NAAQS (>0.100 ppm)	0	0	0
PM_{10}- Particulate Matter <10 microns ($\mu g/m^3$), Highest 24-Hour Average[2]	140	58	46
Number of days above CAAQS (>50 $\mu g/m^3$)	2	2	0
Number of days above NAAQS (>150 $\mu g/m^3$)	0	0	0
$PM_{2.5}$- Particulate Matter <2.5 microns ($\mu g/m^3$), Highest 24 Hour Average[1]	124.3	29.5	25.5
Number of days above NAAQS (>35 $\mu g/m^3$)	7	0	0

ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard

Note: The ambient air quality data presented in this table is intended to be representative of existing conditions and is not a comprehensive summary of all monitoring efforts for all the CAAQS and NAAQS. Additional ambient air quality data can be accessed at https://www.epa.gov/outdoor-air-quality-data/monitor-values-report.

[1] Data from the Sebastopol-103 Morris Street monitoring site.

[2] Data from a monitoring site at Church and First Streets, Guerneville.

Source: CARB 2023b, USEPA 2023g

Sensitive Receptors

The NAAQs and CAAQS were established to represent the levels of air quality considered sufficient, with an adequate margin of safety, to protect public health and welfare. They are designed to protect that segment of the public most susceptible to respiratory distress as a result of poor air quality, such as children under 14, persons over 65, persons engaged in strenuous work or exercise, and people with pre-existing cardiovascular and chronic respiratory diseases. According to CARB, sensitive receptors include residences, long-term health care facilities, rehabilitation centers, convalescent centers, hospitals, retirement homes, schools, playgrounds, and childcare centers (CARB 2005). The closest sensitive receptors to the project site are residential uses immediately adjacent to the project site. In addition, residential receptors approximately 200 feet west of the project site. The Sebastopol Charter School is located approximately 300 feet northeast of the site; however, it is not within the 200 feet threshold to be considered a sensitive receptor that might be affected by the proposed project. Furthermore, the proposed project would include construction of residential units, which would add more sensitive receptors to the project site. Upon completion of Phase I of building construction, residents onsite would be exposed to the building construction air emissions of Phase II for approximately 20 months.

4.2.2 Regulatory Setting

The federal and state governments have authority under the federal and state CAA to regulate emissions of airborne pollutants and have established ambient air quality standards (AAQS) for the protection of public health. An air quality standard is defined as "the maximum amount of a pollutant averaged over a specified period of time that can be present in outdoor air without harming public health" (CARB 2023c). USEPA is the federal agency designated to administer air quality regulation, while CARB is the state equivalent in California. Federal and state AAQS have been established for six criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead (Pb). AAQS are designed to protect those segments of the public most susceptible to respiratory distress, such as children under the age of 14, the elderly (over the age of 65), persons engaged in strenuous work or exercise, and people with cardiovascular and chronic respiratory diseases (USEPA 2023h). In addition, the state of California has established health-based ambient air quality standards for these and other pollutants, some of which are more stringent than the federal standards (CARB 2023d). The federal and state CAA are described in more detail below.

a. Federal Regulations

The CAA was enacted in 1970 and amended in 1977 and 1990 [42 United States Code (USC) 7401] for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare, and productivity. In 1971, to achieve the purposes of Section 109 of the CAA [42 USC 7409], USEPA developed primary and secondary national ambient air quality standards (NAAQS).

The primary NAAQS "in the judgment of the Administrator[2], based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health," and the secondary standards are to "protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air" [42 USC 7409(b)(2)]. USEPA classifies specific geographic areas as either "attainment" or "nonattainment" areas for each pollutant based on the comparison of measured data with the NAAQS[3]. States are required to adopt enforceable plans, known as a State Implementation Plan (SIP), to achieve and maintain air quality meeting the NAAQS. State plans also must control emissions that drift across state lines and harm air quality in downwind states. Once a nonattainment area has achieved the air quality standards for a particular pollutant, it may be redesignated to an attainment area for that pollutant. To be redesignated, the area must meet air quality standards and have a 10-year plan for continuing to meet and maintain air quality standards, as well as satisfy other requirements of the federal CAA. Areas that have been redesignated to attainment are called maintenance areas. Table 4.2-2 lists the current federal standards for regulated pollutants. The project site is within Southern Sonoma County jurisdiction, which currently exceeds the NAAQS for 8-hour ozone and 24-hour $PM_{2.5}$. Southern Sonoma County is currently classified as a nonattainment area under the CAAQS for O_3, PM_{10}, and $PM_{2.5}$ and classified as attainment for the remaining criteria pollutants (CARB 2022).

[2] The term "Administrator" means the Administrator of the USEPA.
[3] Air quality in a geographic area meets or is cleaner than the national standard is called an attainment area (designated "attainment/unclassifiable"). Areas that don't meet the national standard are called nonattainment areas.

Table 4.2-2 Federal and State Ambient Air Quality Standards

Pollutant	NAAQS	CAAQS	NAAQS Status	CAAQS Status
Ozone	0.070 ppm (8-hr avg)	0.09 ppm (1-hr avg) 0.070 ppm (8-hr avg)	Nonattainment (Marginal)	Nonattainment
Carbon Monoxide	35.0 ppm (1-hr avg) 9.0 ppm (8-hr avg)	20.0 ppm (1-hr avg) 9.0 ppm (8-hr avg)	Unclassified/ Attainment	Unclassified/ Attainment
Nitrogen Dioxide	0.100 ppm (1-hr avg) 0.053 ppm (annual avg)	0.18 ppm (1-hr avg) 0.030 ppm (annual avg)	Unclassified/ Attainment	Unclassified/ Attainment
Sulfur Dioxide	0.075 ppm (1-hr avg) 0.5 ppm (3-hr avg) 0.14 ppm (24-hr avg) 0.030 ppm (annual avg)	0.25 ppm (1-hr avg) 0.04 ppm (24-hr avg)	Unclassified/ Attainment	Unclassified/ Attainment
Lead	0.15 mg/m^3 (rolling 3-month avg) 1.5 mg/m^3 (calendar quarter)	1.5 mg/m^3 (30-day avg)	Unclassified/ Attainment	Unclassified/ Attainment
Particulate Matter (PM_{10})	150 mg/m^3 (24-hr avg)	50 mg/m^3 (24-hr avg) 20 mg/m^3 (annual avg)	Unclassified/ Attainment	Nonattainment
Particulate Matter ($PM_{2.5}$)	35 mg/m^3 (24-hr avg) 12 mg/m^3 (annual avg)	12 mg/m^3 (annual avg)	Nonattainment (Moderate)	Nonattainment
Visibility-Reducing Particles	No Federal Standards	Extinction coefficient of 0.23 per kilometer – visibility of ten miles or more (0.07 - 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape. (8-hr avg)	N/A	Unclassified/ Attainment
Sulfates	No Federal Standards	25 mg/m^3 (24-hr avg)	N/A	Unclassified/ Attainment
Hydrogen Sulfide	No Federal Standards	0.03 ppm (1-hr avg)	N/A	Unclassified/ Attainment
Vinyl Chloride	No Federal Standards	0.01 ppm (24-hr avg)	N/A	Unclassified/ Attainment

NAAQS = National Ambient Air Quality Standards; CAAQS = California Ambient Air Quality Standards; ppm = parts per million; avg = average; µg/m^3 = micrograms per cubic meter

Source: CARB 2016, CARB 2022, USEPA 2023i

To derive the NAAQS, USEPA reviews data from integrated science assessments and risk/exposure assessments to determine the ambient pollutant concentrations at which human health impacts occur, then reduces these concentrations to establish a margin of safety (USEPA 2022). As a result, human health impacts caused by the air pollutants discussed above may affect people when ambient air pollutant concentrations are at or above the concentrations established by the NAAQS. The closer a region is to attainting a particular NAAQS, the lower the human health impact is from that pollutant (San Joaquin Valley Air Pollution Control District 2015). Accordingly, ambient air pollutant concentrations below the NAAQS are considered to be protective of human health (CARB

2023c and 2023d). The NAAQS and the underlying science that forms the basis of the NAAQS are reviewed every five years to determine whether updates are necessary to continue protecting public health with an adequate margin of safety (USEPA 2015).

Construction Equipment Fuel Efficiency Standard

The USEPA sets emission standards for construction equipment. The first federal standards (Tier 1) were adopted in 1994 for all off-road engines over 50 horsepower (hp) and were phased in by 2000. A new standard was adopted in 1998 that introduced Tier 1 for all equipment below 50 hp and established the Tier 2 and Tier 3 standards. The Tier 2 and Tier 3 standards were phased in by 2008 for all equipment. The current iteration of emissions standards for construction equipment are the Tier 4 efficiency requirements which are contained in 40 Code of Federal Regulations Parts 1039, 1065, and 1068 (originally adopted in 69 Federal Register 38958 [June 29, 2004], and most recently updated in 2014 [79 Federal Register 46356]). Emissions requirements for new off-road Tier 4 vehicles were completely phased in by the end of 2015.

b. State Regulations

California Clean Air Act

The California Clean Air Act (CCAA) was enacted in 1988 (California Health & Safety Code (H&SC) Section 39000 et seq.). Under the CCAA, the state has developed the CAAQS, which are generally more stringent than the NAAQS. Table 4.2-2 lists the current state standards for regulated pollutants. In addition to the federal criteria pollutants, the CAAQS also specify standards for visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. Similar to the federal CAA, the CCAA classifies specific geographic areas as either “attainment” or “nonattainment” areas for each pollutant, based on the comparison of measured data within the CAAQS.

California Air Toxics Program

A TAC is an air pollutant that may cause or contribute to an increase in mortality or serious illness, or which may pose a present or potential hazard to human health. TACs may result in long-term health effects such as cancer, birth defects, neurological damage, asthma, or genetic damage, or short-term acute effects such as eye watering, respiratory irritation, runny nose, throat pain, and headaches. TACs are considered either carcinogenic or non-carcinogenic based on the nature of the health effects associated with exposure.

In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health (Assembly Bill [AB] 1807: Health and Safety Code Sections 39650–39674). The Legislature established a two-step process to address the potential health effects from TACs. The first step is the risk assessment (or identification) phase. The second step is the risk management (or control) phase of the process.

The California Air Toxics Program establishes the process for the identification and control of TACs and includes provisions to make the public aware of significant toxic exposures and for reducing risk. Additionally, the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987, Connelly Bill) was enacted in 1987 and requires stationary sources to report the types and quantities of certain substances routinely released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, identify facilities having localized impacts, ascertain health risks, notify nearby residents of significant risks, and reduce those significant risks to acceptable levels. The Children's Environmental Health Protection Act, California Senate Bill (SB) 25 (Chapter 731, Escutia, Statutes of

1999), focuses on children's exposure to air pollutants. The act requires CARB to review its air quality standards from a children's health perspective, evaluate the statewide air quality monitoring network, and develop any additional air toxic control measures needed to protect children's health.

State Implementation Plan

The SIP is a collection of documents that set forth the state's strategies for achieving the AAQS. In California, the SIP is a compilation of new and previously submitted plans, programs (such as monitoring, modeling, and permitting), district rules, state regulations, and federal controls. CARB is the lead agency for all purposes related to the SIP under state law. Local air districts and other agencies, such as the Department of Pesticide Regulation and the Bureau of Automotive Repair, prepare SIP elements and submit them to CARB for review and approval. CARB then forwards SIP revisions to the USEPA for approval and publication in the Federal Register. The items included in the California SIP are listed in the Code of Federal Regulations at 40 Code of Federal Regulations 52.220.

The 2017 Clean Air Plan is the SIP for Sonoma County. The Clean Air Plan accommodates growth by projecting the growth in emissions based on different indicators. For example, population forecasts adopted by BAAQMD are used to forecast population-related emissions, as discussed in *Local Regulations*. Through the planning process, emissions growth is offset by basin-wide controls on stationary, area, and transportation sources of air pollution.

California Code of Regulations

The California Code of Regulations is the official compilation and publication of the regulations adopted, amended, or repealed by state agencies pursuant to the Administrative Procedure Act. They are compiled into Titles and organized into Divisions containing the regulations of state agencies. The following policies in the California Code of Regulations would be applicable to the proposed project:

- **Engine Idling.** In accordance with Section 2485 of Title 13 of the California Code of Regulations, the idling of all diesel-fueled commercial vehicles (weighing over 10,000 pounds) during construction shall be limited to five minutes at any location.
- **Emission Standards.** In accordance with Section 93115 of Title 17 of the California Code of Regulations, operation of any stationary, diesel-fueled, compression-ignition engines shall meet specified fuel and fuel additive requirements and emission standards.

c. Local Regulations

Air Quality Management Plan

The BAAQMD is responsible for assuring that the federal and State ambient air quality standards are attained and maintained in the Bay Area. The BAAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, conducting public education campaigns, as well as many other activities.

The BAAQMD adopted the 2017 Clean Air Plan (2017 Plan) as an update to the 2010 Clean Air Plan in April 2017. The 2017 Plan provides a regional strategy to protect public health and the climate. To fulfill state ozone planning requirements, the 2017 control strategy includes all feasible measures to reduce emissions of ozone precursors—ROG and NO_X—and reduce transport of ozone and its precursors to neighboring air basins. The 2017 Plan builds upon and enhances the BAAQMD's efforts to reduce emissions of fine particulate matter TACs (BAAQMD 2017).

BAAQMD Rules

The BAAQMD implements rules and regulations for emissions that may be generated by various uses and activities. The rules and regulations detail pollution-reduction measures that must be implemented during construction and operation of projects. Rules and regulations relevant to the project include the following:

- **Regulation 8, Rule 3 (Architectural Coatings):** This rule limits the quantity of volatile organic compounds that can supplied, sold, applied, and manufactured within the BAAQMD region.

City of Sebastopol 2035 General Plan

On November 15, 2016, the Sebastopol General Plan was adopted. The Sebastopol General Plan includes goals and policies to address sustainability aimed in part at improving air quality. The following are applicable goals and policies that relate to the proposed project (City of Sebastopol 2016):

Goal COS 7: Improve Air Quality in Sebastopol and Reduce Air Quality Impacts from Future Development.

Policy COS 7-1 Improve air quality through continuing to require a compact development pattern that focuses growth in and around existing urbanized areas, locating new housing near places of employment, encouraging non-vehicular modes of transportation, and requiring projects to mitigate significant air quality impacts.

Policy COS 7-2 Minimize exposure of sensitive receptors to concentrations of air pollutant emissions and toxic air contaminants.

Policy COS 7-4 Continue to cooperate with BAAQMD in implementing the regional Clean Air Plan.

Policy COS 7-5 Continue to enforce air quality standards in collaboration with the BAAQMD.

Policy COS 7-7 Continue to require all construction projects and ground disturbing activities to implement BAAQMD dust control and abatement measures.

4.2.3 Impact Analysis

a. Significance Thresholds and Methodology

Significance Threshold

To determine whether a project would result in a significant impact to air quality, Appendix G of the *CEQA Guidelines* requires consideration of whether a project would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The BAAQMD has adopted guidelines for quantifying and determining the significance of air quality emissions in its *2022 CEQA Air Quality Guidelines*.

Regional Significance Thresholds

The BAAQMD's *2022 CEQA Air Quality Guidelines* are used in this analysis to evaluate air quality. Table 4.2-3 shows the significance thresholds for construction and operational-related criteria air pollutant and precursor emissions being used for the purposes of this analysis. These thresholds represent the levels at which a project's individual emissions of criteria air pollutants or precursors would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions. For the purposes of this analysis, the project would result in a significant impact if construction or operational emissions would exceed thresholds as shown in Table 4.2-3.

Table 4.2-3 BAAQMD Air Quality Significance Thresholds

	Construction Thresholds	Operational Thresholds	
Pollutant	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	Maximum Annual Emissions (tons/year)
ROG	54	54	10
NO_X	54	54	10
PM_{10}	82 (exhaust)	82	15
$PM_{2.5}$	54 (exhaust)	54	10

ROG = reactive organic gases, NO_X = nitrogen oxides, PM_{10} = particulate matter 10 microns in diameter or less, $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter; lbs/day = pounds per day

Source: BAAQMD 2023

Carbon Monoxide

BAAQMD provides a preliminary screening methodology to conservatively determine whether a proposed project would exceed carbon monoxide thresholds. If the following criteria are met, a project would result in a less than significant impact related to local carbon monoxide concentrations:

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

Toxic Air Containments Thresholds

BAAQMD has developed significance thresholds for the emissions of TACs based on health risks associated with elevated exposure to such compounds. For carcinogenic compounds, cancer risk is assessed in terms of incremental excess cancer risk. An individual project would result in a potentially significant impact if it would generate an incremental excess cancer risk of 10 in 1 million (1×10^{-6}) persons, a chronic and acute hazard index greater than 1.0, and a $PM_{2.5}$ annual average increase of 0.3 $\mu g/m^3$. In addition, a project would result in a potentially significant cumulative impact if it would generate an incremental excess cancer risk of 100 in 1 million (1×10^{-6}) persons, a chronic and acute hazard index greater than 10.0, and a $PM_{2.5}$ annual average increase of 0.8 $\mu g/m^3$. (BAAQMD 2023).

Odor Sources

The BAAQMD provides minimum distances for siting of new odor sources as shown in Table 4.2-4. A significant impact would occur if the project would result in other emissions (such as odors) affecting substantial numbers of people or would site a new odor source within the specified distances of existing receptors.

Table 4.2-4 BAAQMD Odor Source Thresholds Table

Odor Source	Minimum Distance for Less than Significant Odor Impacts (in miles)
Wastewater treatment plant	2
Wastewater pumping facilities	1
Sanitary Landfill	2
Transfer Station	1
Composting Facility	1
Petroleum Refinery	2
Asphalt Batch Plant	2
Chemical Manufacturing	2
Fiberglass Manufacturing	1
Painting/Coating Operations	1
Rendering Plant	2
Coffee Roaster	1
Food Processing Facility	1
Confined Animal facility/feed lot/diary	1
Green Waste and Recycling Operations	1
Metal Smelting Plants	2

Methodology

Air pollutant emissions generated by project construction and operation were estimated using CalEEMod version 2022.1. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from a variety of land use projects. CalEEMod allows for the use of standardized data (e.g., emission factors, trip lengths, meteorology, source inventory) provided by the various California air districts to account for local requirements and conditions, and/or user-defined inputs. The calculation methodology and input data used in CalEEMod can be found in the CalEEMod User's Guide Appendices C, D, and G (California Air Pollution Control Officers Associated 2022). The analysis reflects the details of construction and operation of the proposed project as described in Section 2.0, *Project Description*.

Construction

Project construction would primarily generate temporary criteria pollutant emissions from construction equipment operation on-site, construction worker vehicle trips to and from the site, and import of materials off-site. Construction of the proposed project was analyzed based on the land use type, building square footage, construction schedule, and a list of anticipated construction equipment provided by the applicant. The project would construct 80 multi-story townhome-styled condos, 16 accessory dwelling units, and surface parking spaces. Project construction would occur over two phases. Phase I construction would begin in June 2024 and end June 2026, and Phase II would begin in March 2025 and end February 2027. Project construction would occur over approximately 33 months. During Phase I construction, approximately 2,092 cubic yards of soil would be imported during the construction grading phase. In addition, approximately 1,566 cubic yards of soil would be imported during the grading phase of Phase II construction. It is assumed construction equipment used would be diesel-powered and, the project would comply with applicable regulatory standards, such as BAAQMD's Basic Best Management Practices fugitive dust control measures and Regulation 8 Rule 3, Architectural Coating.

Operation

Operational emissions modeled include mobile and area source emissions. The project would not include natural gas consumption and would not emit energy emissions onsite. The Traffic Impact Study (TIS) prepared by W-Trans, estimated the project would generate 684 daily vehicle trips, consisting of 576 daily trips from townhomes/condos and 108 daily trips from the accessory dwelling units (W-Trans 2023). Area source emissions are generated by consumer products and architectural coatings. There currently is no natural gas service provided at the project site; therefore, the energy source emissions are excluded.

b. Project Impacts and Mitigation Measures

Threshold 1:	Would the project conflict with or obstruct implementation of the applicable air quality plan?

Impact AQ-1 THE PROJECT WOULD NOT CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE 2017 CLEAN AIR PLAN. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The California CAA requires that air districts create a Clean Air Plan (2017 CAP) that describes how the jurisdiction will meet air quality standards. The most recently adopted air quality plan is the BAAQMD 2017 Plan. The Clean Air Plan builds upon and enhances the BAAQMD's efforts to reduce emissions of fine particulate matter and TACs. The 2017 Plan does not include control measures that apply directly to individual development projects. Instead, the control strategy includes control measures related to stationary sources, transportation, energy, buildings, agriculture, natural and working lands, waste management, water, and super-GHG pollutants.

The 2017 CAP focuses on two paramount goals:

- Protect air quality and health at the regional and local scale by attaining all national and state air quality standards and eliminating disparities among Bay Area communities in cancer health risk from TACs.
- Protect the climate by reducing Bay Area GHG emissions to 40 percent below 1990 levels by 2030, and 80 percent below 1990 levels by 2050.

Under BAAQMD's methodology, a determination of consistency with the 2017 Plan should demonstrate that a project:

- Supports the primary goals of the air quality plan.
- Includes applicable control measures from the air quality plan.
- Does not disrupt or hinder implementation of any air quality plan control measures.

A project that would not support the 2017 Plan's goals would not be consistent with the 2017 Plan. On an individual project basis, consistency with BAAQMD quantitative thresholds is interpreted as demonstrating support for the clean air plan's goals. As shown in the response to Threshold 2 (Table 4.2-6 and Table 4.2-7), the project would not result in exceedances of BAAQMD thresholds for criteria air pollutants and thus would not conflict with the 2017 Plan's goal to attain air quality standards. Furthermore, as shown in Table 4.2-5, the proposed project would include applicable control measures from the 2017 Plan and would not disrupt or hinder implementation of such control measures. Therefore, project impacts related to conflicts with or obstruction of the 2017 Plan would be less than significant.

Table 4.2-5 Project Consistency with Applicable Control Measures of 2017 Plan Table

Control Measure	Evaluation
TR9: Bicycle and Pedestrian Access and Facilities. Encourage planning for bicycle and pedestrian facilities in local plans, e.g., general and specific plans, fund bike lanes, routes, paths and bicycle parking facilities.	**Consistent**. The project would 96 bicycle parking spaces, with 80 long-term spaces located in each residential garage and 16 spaces in onsite bicycle racks.
EN2: Decrease Electricity Demand. Work with local governments to adopt additional energy-efficiency policies and programs. Support local government energy efficiency program via best practices, model ordinances, and technical support. Work with partners to develop messaging to decrease electricity demand during peak times.	**Consistent**. The proposed project is anticipated to exceed the energy efficiency standards of 2022 Title 24 Standards, California Building Energy Efficiency Standards, by five to 10 percent. The Title 24 standards are updated every three years and become increasingly more stringent over time. In addition, the proposed building would include all-electric appliances, powered by solar to the project.
BL1: Green Buildings. Collaborate with partners such as KyotoUSA to identify energy-related improvements and opportunities for on-site renewable energy systems in school districts; investigate funding strategies to implement upgrades. Identify barriers to effective local implementation of the CALGreen (Title 24) statewide building energy code; develop solutions to improve implementation/enforcement. Work with ABAG's BayREN program to make additional funding available for energy-related projects in the buildings sector. Engage with additional partners to target reducing emissions from specific types of buildings.	**Consistent**. The proposed project would include solar and all-electric appliances to the project. In addition, the proposed project would exceed the energy efficiency measures with the 2022 Title 24 Building Efficiency Standards by five to 10 percent. For example, the project would dedicated circuitry for electric vehicle charging stations for all townhome garages, which is beyond the requirement of the 2022 Title 24 Standards. The CALGreen standards are updated every three years and become increasingly more stringent over time.
WR2: Support Water Conservation. Develop a list of best practices that reduce water consumption and increase on-site water recycling in new and existing buildings; incorporate into local planning guidance.	**Consistent**. The proposed project would be required to comply with all water conservation standards of CALGreen that are in effect at that time. The project would include ultra-low flow water fixtures, low Impact landscaping, and onsite stormwater capture.

Source: BAAQMD 2017

Threshold 2: Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Impact AQ-2 PROJECT CONSTRUCTION AND OPERATION WOULD NOT EXCEED THE REGIONAL THRESHOLD FOR ANY CRITERIA POLLUTANT. THE PROJECT WOULD NOT RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE OF ANY CRITERIA POLLUTANT FOR WHICH THE PROJECT REGION IS IN NON-ATTAINMENT UNDER AN APPLICABLE FEDERAL OR STATE AMBIENT AIR QUALITY STANDARD. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Construction Emissions

Project construction would involve construction activities that have the potential to generate air pollutant emissions. Table 4.2-6 summarizes the estimated maximum daily emissions of ROG, NO_X, CO, PM_{10} exhaust, $PM_{2.5}$ exhaust, and sulfur oxide (SO_X) during project construction. As shown in Table 4.2-6, project construction emissions for all criteria pollutants would be below the BAAQMD average daily thresholds of significance. Therefore, impacts would be less than significant.

Table 4.2-6 Project Construction Emissions

	Average Daily Emissions (lbs./day)					
	ROG	NO_X	CO	SO_X	PM10 (exhaust)	PM2.5 (exhaust)
2024	1	7	7	<1	<1	<1
2025	2	13	18	<1	1	<1
2026	2	8	153	<1	<1	<1
2027	1	<1	1	<1	<1	<1
Maximum Average Daily Emissions	2	13	153	<1	1	<1
BAAQMD Thresholds (average daily emissions)	54	54	N/A	N/A	82	54
Threshold Exceeded?	No	No	N/A	N/A	No	No

Lbs./day = pounds per day; ROG = reactive organic gases; NO_X = nitrogen oxide; CO = carbon monoxide; PM10 = particulate matter with a diameter no more than 10 microns; PM2.5 = particulate matter with a diameter no more than 2.5 microns; SO_X = sulfur oxide N/A = not applicable (no BAAQMD threshold for CO or SOX); BAAQMD = Bay Area Air Quality Management District.

Source: See CalEEMod worksheets in Appendix B.

The BAAQMD does not have quantitative thresholds for fugitive dust emissions during construction. Instead, the BAAQMD recommends Best Management Practices (BMPs) be implemented to reduce fugitive dust emissions. With implementation of the BAAQMD fugitive dust BMPs, construction air quality impacts from fugitive dust would be less than significant.

Operational Emissions

Long-term emissions associated with project operation are shown in Table 4.2-7 . As shown in Table 4.2-7 emissions would not exceed BAAQMD daily or annual thresholds for any criteria pollutant. Since project emissions would not exceed BAAQMD thresholds for construction or operation, the project would not violate an air quality standard or result in a cumulatively considerable net increase in criteria pollutants and impacts would be less than significant.

Table 4.2-7 Project Operational Emissions

Sources	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	SO_X
	Average Daily Emissions (lbs./day)					
Mobile	3	3	19	4	1	<1
Area	2	<1	3	<1	<1	<1
Total Project Emissions	5	3	22	4	1	<1
BAAQMD Thresholds	54	54	N/A	82	54	N/A
Threshold Exceeded?	**No**	**No**	**N/A**	**No**	**No**	**N/A**
	Annual Emissions (tons/yr.)					
Mobile	<1	<1	3	1	<1	<1
Area	<1	<1	<1	<1	<1	<1
Total Project Emissions	1	<1	4	1	<1	<1
BAAQMD Thresholds	10	10	N/A	15	10	N/A
Threshold Exceeded?	**No**	**No**	**N/A**	**No**	**No**	**N/A**

Lbs./day = pounds per day; ROG = reactive organic gases; NO_x = nitrogen oxide; CO = carbon monoxide; PM_{10} = particulate matter with a diameter no more than 10 microns; $PM_{2.5}$ = particulate matter with a diameter no more than 2.5 microns; SO_x = sulfur oxide N/A = not applicable (no BAAQMD threshold for CO or SO_X); BAAQMD = Bay Area Air Quality Management District.

Source: Average daily and annual emissions. See Table 2.6 "Operations Emissions by Sector, Mitigated". See CalEEMod worksheets in Appendix B. Numbers may not add exactly due to rounding.

Threshold 3: Would the project expose sensitive receptors to substantial pollutant concentrations?

Impact AQ-3 **THE PROJECT WOULD NOT INCREASE CARBON MONOXIDE CONCENTRATIONS SUCH THAT IT WOULD CREATE CARBON MONOXIDE HOTSPOTS. HOWEVER, PROJECT CONSTRUCTION COULD POTENTIALLY EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL POLLUTANT CONCENTRATIONS IN THE FORM OF TOXIC AIR CONTAMINANT EMISSIONS GIVEN THE PROXIMITY TO SURROUNDING AND FUTURE ONSITE SENSITIVE RECEPTORS. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED.**

Carbon Monoxide Hotspots

A carbon monoxide hotspot is a localized concentration of carbon monoxide that is above ambient air quality standard. Localized carbon monoxide hotspots can occur at intersections with heavy peak hour traffic. Specifically, hotspots can be created at intersections where traffic levels are sufficiently high such that the local carbon monoxide concentration exceeds the federal one-hour standard of 35.0 parts per million (ppm) or the federal and state eight-hour standard of 9.0 ppm (CARB 2016).

BAAQMD recommends comparing project's attributes with the following screening criteria as a first step to evaluating whether the project would result in the generation of carbon monoxide concentrations that would substantially contribute to an exceedance of the *Thresholds of Significance*. The project would result in a less than significant impact to localized carbon monoxide concentrations if:

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

- The project traffic would not increase traffic volumes at the affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage).

The project would generate 684 daily vehicle trips. According to the existing traffic volumes shown in the TIS, prepared by W-Trans, the highest peak hour traffic volume is the intersection of Occidental Road and Gravenstein Highway, with a peak traffic volume of 2,296 vehicles. The project would add approximately 180 vehicles during peak hour traffic (W-Trans 2023). Therefore, the project would not increase vehicle traffic at any intersections above the screening thresholds listed above and the impact of localized carbon monoxide emissions would not be significant.

Toxic Air Contaminants

Construction Impacts

Construction-related activities would result in temporary project-generated DPM exhaust emissions from off-road, heavy-duty diesel equipment for site preparation, grading, building construction, and other construction activities. Generation of DPM, which was identified as a TAC by CARB in 1998, from construction projects typically occurs in a single area for a short period. The proposed project's construction would occur in phases over approximately 31 months with sensitive receptors adjacent to the project site. In addition, onsite residents, after the completion of Phase I, would be exposed to 20 months of construction during Phase II construction.

The proposed project would be consistent with the applicable AQMP requirements and control strategies intended to reduce emissions from construction equipment and activities. The proposed Project would comply with the CARB Air Toxics Control Measure that limits diesel powered equipment and vehicle idling to no more than five minutes at a location, and the CARB In-Use Off-Road Diesel Vehicle Regulation; compliance with these would minimize emissions of TACs during construction. However, given the construction area's proximity to nearby and onsite sensitive receptors, and the estimated on-site particulate matter emissions during grading and site preparation, impacts from TACs could be potentially significant and mitigation is required.

Operational Impacts

CARB’s *Air Quality and Land Use Handbook: A Community Health Perspective* (2005) provides recommendations regarding the siting of new sensitive land uses near potential sources of air toxic emissions (e.g., freeways, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and gasoline dispensing facilities). CARB guidelines recommend siting distances both for the development of sensitive land uses in proximity to TAC sources and for the addition of new TAC sources in proximity to existing sensitive land uses. The project is not near potential sources of TAC emissions as listed above. Townhomes and accessory dwelling units land uses are not considered land uses that generate substantial TAC emissions based on reviewing the air toxic sources listed in CARB’s guidelines. Therefore, the expected hazardous TACs generated on site (e.g., cleaning solvents, paints, landscape pesticides, etc.) for the proposed land uses would be below thresholds warranting further study under the California Accidental Release Program. The project would not expose off-site sensitive receptors to significant amounts of carcinogenic or TACs. Therefore, operational impacts would be less than significant.

Mitigation Measures

AQ-1 Construction TACs Reduction

The applicant and project engineer shall include the measures listed below on the grading plan, building plans, and specifications. Prior to issuance of grading permits, the City Engineer and the Chief Building Official shall confirm that the grading plan, building plans, and specifications stipulate that the measures listed below shall be implemented during project construction. The construction contractor shall implement these measures for the duration of construction.

- All mobile off-road equipment (wheeled or tracked) used during construction activities shall meet the USEPA Tier 4 final standards. Tier 4 certification can be for the original equipment or equipment that is retrofitted to meet the Tier 4 Final standards.
- Alternative Fuel (natural gas, propane, electric, other non-diesel fuels) construction equipment shall be incorporated where available. These requirements shall be incorporated into the contract agreement with the construction contractor. A copy of the equipment's certification or model year specifications shall be available upon request for all equipment on-site.
- Electricity shall be supplied to the site from the existing power grid to support the electric construction equipment. If connection to the grid is determined to be infeasible for portions of the project, a non-diesel fueled generator shall be used.

Significance After Mitigation

With the incorporation of Mitigation Measure AQ-1, the project would reduce DPM emissions by approximately 85 to 92 percent compared to standard CalEEMod engine tier assumptions. With these reductions, construction activities would not expose sensitive receptors to substantial toxic air contaminant concentrations, and construction-related health impacts would be less than significant with mitigation.

Threshold 4:	Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Impact AQ-4 THE PROPOSED PROJECT WOULD NOT RESULT IN OTHER EMISSIONS (SUCH AS THOSE LEADING TO ODORS) THAT WOULD ADVERSELY AFFECT A SUBSTANTIAL NUMBER OF PEOPLE. THEREFORE, IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The project would generate oil and diesel fuel odors during construction from equipment use. The odors would be limited to the construction period and would be intermittent and temporary. Furthermore, these odors would dissipate rapidly with distance from in-use construction equipment. Accordingly, project construction would not result in other emissions, such as those leading to odors, that would adversely affect a substantial number of people, and impacts would be less than significant.

As stated in the BAAQMD *CEQA Guidelines,* land uses typically producing objectionable odors include agricultural uses, wastewater treatment plants, food manufacturing plants, chemical plants, composting, refineries, landfills, and confined animal facilities. Project development would include townhouse and accessory dwelling unit development. These land uses typically do not produce objectionable odors and are not identified on this list shown in Table 4.2-4. Therefore, the proposed project would not generate objectionable odors affecting a substantial number of people, and impacts would be less than significant.

4.2.4 Cumulative Impacts

The geographic scope for the cumulative air quality impact analysis is the SFBAAB. Because the SFBAAB is designated a nonattainment area for the federal and State one-hour and eight-hour ozone standards, State PM_{10} standards, and federal and State annual $PM_{2.5}$ standard, there is an existing adverse effect in the SFBAAB relative to these pollutants. In addition, unplanned growth in the area has the potential to exacerbate the pollution and hinder the achievement of the NAAQS and CAAQS within the SFBAAB. As identified in Table 3-1, *Cumulative Project List,* in Section 3.3, *Cumulative Development*, there are nine currently planned and pending projects in Sebastopol.

This cumulative impact analysis is based on the BAAQMD's recommendations included in their *2022 CEQA Guidelines* (BAAQMD 2023). Individual projects under the BAAQMD's jurisdiction would cause a cumulatively considerable increase in emissions for which the SFBAAB is in non-attainment if the individual project exceeds the BAAQMD's recommended thresholds.

Each cumulative project listed in Section 3.3, *Cumulative Development*, could generate emissions during construction and operation. However, neither the proposed project nor any of the related projects are part of an ongoing regulatory program or are contemplated in a Program EIR. Therefore, project-specific air quality impacts would be used to determine if a project's contribution to cumulative air quality impacts would be significant.

As discussed above, the proposed project would be consistent with the BAAQMD 2017 CAP. Additionally, construction and operation of the project would not exceed regional significance thresholds. Therefore, the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment.

Cumulative projects could expose sensitive receivers to cancer risks that exceed the BAAQMD health risk thresholds; however, similar to the proposed project, cumulative projects would be required to comply with BAAQMD regulations and thresholds to reduce the potential for significant impacts to sensitive receivers. As described under Impact AQ-3 above, TAC emissions from project construction could potentially cause a significant health impact from on-site emissions and proximity to sensitive receptors if unmitigated. Therefore, Mitigation Measure AQ-1 would be implemented to reduce construction TAC emissions to less than significant, and the proposed project's contribution to cumulative TAC impacts would not be cumulatively considerable. In addition, as shown in Figure 3-1 of Section 3, *Environmental Setting*, there are no approved or pending cumulative projects within 1,000 feet from the proposed project that could result in cumulative impacts at sensitive receptors. Therefore, the proposed project's contribution to cumulative TAC emissions would not be cumulatively considerable.

Cumulative projects would adversely affect sensitive receptors from odor emissions if cumulative projects were typical odor-producing land uses. Construction of cumulative projects would result in construction equipment-related odors; however, the temporary nature of construction would ensure less than significant cumulative odor impacts. Since the proposed project's construction would be temporary and operational activities would not produce substantial odors, the project's cumulative contribution to cumulative odor emission impacts would not be considerable.

4.3 Biological Resources

This section provides an assessment of the potential for direct and indirect impacts to sensitive natural communities, special-status plant and wildlife species, regulated waterways and wetlands, sensitive habitat and mature native trees, and wildlife movement corridors associated with the proposed project. The analysis presented herein is based on a Biological Resources Analysis (BRA) [Johnson Marigot Consulting, LLC (Johnson Marigot) 2021, and Integral Consulting Inc. (Integral) 2023; Appendix C], and a Tree Inventory Report (Horticultural Associates 2019, 2023; Appendix D).

4.3.1 Setting

The City of Sebastopol is located in Central Sonoma County, along the western edge of the Santa Rosa Plain, bordered to the west by foothills of the California coastal range and to the east by Laguna de Santa Rosa (a perennial stream) and developed areas of the Valley floor. The project site is located at 1009-1011 Gravenstein Highway North, on the east side of Gravenstein Highway North southeast of its intersection with Mill Station Road, east of Hurlbut Avenue, within developed areas of the city. The vicinity of the project site includes residential and commercial areas. The Laguna de Santa Rosa is approximately 0.8 mile to the east, south of U.S. Highway 101.

a. Existing Conditions

General surveys of the project site were conducted on May 21, 2021, and July 18, 2023, to document biological resources and to assess the likelihood of resource agency regulated areas on the project site (Integral 2023). The site consists of a remnant apple orchard with some native trees, including coast live oak (*Quercus agrifolia*), Douglas fir (*Pseudotsuga menziesii*), valley oak (*Quercus lobata*), and coast redwood (*Sequoia sempervirens*). The understory in the orchard is disced regularly and was mostly bare at the time of the surveys. Dense Himalayan blackberry (*Rubus armeniacus*) thickets occur around the edges of the site where fence lines prevent discing.

The southwest corner of the site was used as a community garden up until sometime after 2021. During the site survey in 2023, common weedy nonnative (ruderal) species were observed in this area, including bristly ox-tongue (*Helminthotheca echioides*), French broom (*Genista monspessulana*), wild radish (*Raphanus sativus*), and hair cat's-ear (*Hypochaeris radicata*) (Integral 2023).

There is a stormwater basin adjacent to the north end of the site, which likely receives surface flow from the site during rain events (Johnson Marigot 2021).

b. Special-status Species

Special-status species are those plants and animals listed, proposed for listing, or candidates for listing as threatened or endangered by the USFWS or National Marine Fisheries Service (NMFS) under the federal Endangered Species Act (FESA); those listed or proposed for listing as rare, threatened, or endangered by CDFW under the California Endangered Species Act (CESA) or Native Plant Protection Act; animals designated as "Species of Special Concern," "Fully Protected," or "Watch List" by CDFW; and plants with a California Rare Plant Rank (CRPR) of 1 or 2, which are defined as:

- List 1A = Plants presumed extinct in California
- List 1B.1 = Rare or endangered in California and elsewhere; seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)
- List 1B.2 = Rare or endangered in California and elsewhere; fairly endangered in California (20-80 percent occurrences threatened)
- List 1B.3 = Rare or endangered in California and elsewhere, not very endangered in California (<20 percent of occurrences threatened or no current threats known)
- List 2 = Rare, threatened or endangered in California, but more common elsewhere

Queries of the California Natural Diversity Database (CNDDB; CDFW 2023a) and Online Inventory of Rare and Endangered Plants of California (Online Inventory; CNPS 2023) were conducted by Rincon biologists to update the list compiled by Integral (2023) regarding special-status species considered to have potential to occur within the project site. For this review, the search included all occurrences within the USGS 7.5-minute topographic quadrangle encompassing the project site (*Sebastopol*), and the eight surrounding quadrangles (*Guerneville, Healdsburg, Mark West Springs, Camp Meeker, Santa Rosa, Valley Ford, Two Rock,* and *Cotati*).

Special-Status Plants

The BRA evaluated 39 special-status plant species for potential to occur on the project site. Rincon identified 39 additional special-status plant species that have been documented within the nine-quadrangle search radius in the CNDDB and CNPS (2023). None of these species were observed during the site survey or would be expected to occur within the project site. All seventy-eight special-status plant species could be excluded based on known ranges and elevations, the lack of natural vegetation communities on site, level of development and disturbance from discing, lack of connectivity to natural vegetation communities, and the species-specific habitat requirements.

One Monterey pine (*Pinus radiata*, California Rare Plant Rank 1B.1) was documented adjacent to the project site (Horticultural Associates 2019); however, this individual occurs as ornamental landscaping and is not a natural occurrence.

Special-status Wildlife

The BRA evaluated eight special-status animal species documented in CNDDB within three miles of the project site, none of which were identified as having the potential to occur on the project site (Integral 2023). Rincon identified 22 additional special-status wildlife species that have been documented within the nine-quadrangle search radius in the CNDDB (2023).

Based on the existing conditions on the project site and updated queries of the CNDDB and Online Inventory, four species not addressed in BRA report were identified for further review: western bumble bee (*Bombus occidentalis*, state candidate endangered), pallid bat (*Antrozous pallidus*, California species of special concern [SSC]), Townsend's big-eared bat (*Corynorhinus townsendii*, SSC), and western red bat (*Lasiurus frantzii*, SSC).

Western Bumble Bee

The historic range of western bumble bee covered much of the western United States, from the Pacific coast to the Colorado Rocky Mountains. Western bumble bees are eusocial insects living in a colony with workers and one queen. They typically nest underground in rodent burrows or other cavities which may be lined with grass or bird feathers (Hatfield et al., 2015). The flight period for queens is early February through late November in California, peaking in late June through late September. The flight period for males and worker females is early April to early November. Most of the colony dies off at the start of winter, including the queen. A cast of reproductive females will continue to forage (gather nectar) and hibernate over the winter. These females will become queens and start new colonies the following spring. This species has a wide variety of plant associations, including but not limited to, species in the genera: *Melilotus, Cirsium, Trifolium, Centaurea, Chrysothamnus*, and *Eriogonum* (Koch, Strange, and Williams, 2012). Flowering plants are present; therefore, this species has a moderate potential to occur within the project site.

Special-status BATS

Townsend's big-eared bat is closely associated with mines and caves. Unlike other bats, this species roosts in the open, hanging from walls and ceilings instead of in cracks and crevices. It may also roost in buildings that provide a cave-like environment, such as dark attics or basements. Pallid bat roost in caves and mines as well as crevices; they roost in hollow trees and buildings occasionally. These species are both highly sensitive to human disturbance. Trees on the project site may provide day roosting habitat, but are unlikely to support maternal colonies due to their size (small, without large hollows), and degree of human presence in the surrounding area. Therefore, Townsend's big-eared bat and pallid bat have a low potential to occur on site while foraging or day roosting.

Western red bat primarily roost in tree foliage, and occasionally shrubs, along habitat edges in woodlands, forests, and urban areas (Ziner, Mayer, and Laudenslayer 1990). This species is largely solitary, and prefers riparian habitats, but may also be found in orchards. Given the site's location within a mile of Laguna de Santa Rosa and number of trees present, this species has a moderate potential to occur within the project site.

Nesting Birds

Non-game migratory birds and native birds protected under California Fish and Game Code (CFGC) Section 3503 and the federal Migratory Bird Treaty Act (MBTA), such as native avian species common to developed and ruderal areas, have the potential to breed and forage in the project site and vicinity. Species of birds common to the area that typically occur in the region, such as black phoebe (*Sayornis nigricans*), house finch (*Haemorhous mexicanus*), Anna's hummingbird (*Calypte anna*), American crow (*Corvus brachyrhynchos*), and red-shouldered hawk (*Buteo lineatus*) may nest on the project site. Nesting by a variety of common birds protected by CFGC Section 3503 and the MBTA could occur in virtually any location throughout the project site containing native or non-native vegetation, bare ground, or buildings. The nesting season in California generally extends from February 1 through August 31 but can vary based on annual climatic conditions.

c. Sensitive Natural Communities and Critical Habitat

Sensitive Natural Communities

Plant communities are also considered sensitive biological resources if they have limited distributions, a high-wildlife value, include sensitive species, or are particularly susceptible to disturbance. CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in the CNDDB. The CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's methodology (Jennings et al. 2009), with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Some alliances with the rank of 4 and 5 have also been included in the 2023 sensitive natural communities list under the revised ranking methodology (CDFW 2023b). One sensitive natural community was identified within the nine-quadrangle search radius: Valley Oak Woodland. However, this community was not observed on the project site, and no other vegetation alliances that would be considered sensitive by CDFW were observed.

Critical Habitat

No federally designated critical habitats occur on the project site (Integral 2023).

d. Jurisdictional Waters and Wetlands

No potential jurisdictional features occur on the project site (USGS 2023). A stormwater basin was observed adjacent to the site, however the basin is dominated by upland nonnative plants, including silver wattle (*Acacia dealbata*) and Harding grass (*Phalaris aquatica*) (Johnson Marigot 2021).

e. Wildlife Movement

Wildlife movement corridors, or habitat linkages, are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as providing a linkage between foraging and denning areas, or they may be regional in nature. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then subsequently return. Other corridors may be important as dispersal corridors for young animals. A group of habitat linkages in an area can form a wildlife corridor network.

Habitats within a habitat linkage do not necessarily need to be identical to those habitats being linked. Rather, the linkage needs only to contain sufficient cover and forage to allow temporary utilization by species moving between core habitat areas. Habitat linkages are typically contiguous strips of natural areas, though dense plantings of landscape vegetation can be used by certain disturbance-tolerant species. Some species may require specific physical resources (such as rock outcroppings, vernal pools, or oak trees) within the habitat link for the linkage to serve as an effective movement corridor, while other more mobile or aerial species may only require discontinuous patches of suitable habitat to permit effective dispersal and/or migration. Wildlife movement corridors may occur at either large or small scales. The California Essential Habitat Connectivity Project commissioned by the California Department of Transportation (Caltrans) and CDFW identifies “Natural Landscape Blocks” which support native biodiversity and the “Essential Connectivity Areas” which link them (Spencer et al. 2010).

An Essential Connectivity Area is mapped to the west of the City of Sebastopol in the coastal range, but the site is isolated by development (CDFW 2023c). The project site is surrounded by development and therefore does not function as a large- or small-scale corridor for wildlife movement.

4.3.2 Regulatory Setting

a. Federal Regulations

Endangered Species Act

Under FESA, authorization is required to "take" a listed species. Take is defined under FESA Section 3 as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Under federal regulation (50 Code of Federal Regulations Sections 17.3, 222.102), "harm" is further defined to include habitat modification or degradation where it would be expected to result in death or injury to listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Critical habitat is a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. FESA Section 7 outlines procedures for federal interagency cooperation to conserve federally listed species and designated critical habitat.

Section 7(a)(2) of FESA and its implementing regulations require federal agencies to consult with USFWS or National Marine Fisheries Service to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of critical habitat. For projects where federal action is not involved and take of a listed species may occur, the project proponent may seek to obtain an incidental take permit under FESA Section 10(a). Section 10(a) allows USFWS to permit the incidental take of listed species if such take is accompanied by a Habitat Conservation Plan that includes components to minimize and mitigate impacts associated with the take.

The USFWS and National Marine Fisheries Service share responsibility and regulatory authority for implementing FESA (7 United States Code [USC] Section 136, 16 USC Section 1531 et seq.).

Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds. The act provides that it is unlawful, except as permitted by regulations, "to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, […] any migratory bird, or any part, nest, or egg of any such bird" (16 USC Section 703[a]). The Bald and Golden Eagle Protection Act is the primary law protecting eagles, including individuals and their nests and eggs. USFWS implements the MBTA (16 USC Section 703-711) and the Bald and Golden Eagle Protection Act (16 USC Section 668). Under the Act's Eagle Permit Rule (50 Code of Federal Regulations Section 22.26), USFWS may issue permits to authorize limited, non-purposeful take of bald eagles and golden eagles.

b. State Regulations

Endangered Species Act and Fully Protected Species

CESA (CFGC 2050 et seq.) prohibits take of State-listed threatened and endangered species without a CDFW incidental take permit. Take under CESA is restricted to direct harm of a listed species and does not prohibit indirect harm by way of habitat modification.

The protection of fully protected species is described in CFGC 3511, 4700, 5050 and 5515. These statutes prohibit take or possession of fully protected species. Incidental take of fully protected species may be authorized under an approved Natural Communities Conservation Plan.

California Fish and Game Code Sections 3503, 3503.5 and 3511

CFGC sections 3503, 3503.5 and 3511 describe unlawful take, possession, or destruction of birds, nests, and eggs. Fully protected birds (CFGC Section 3511) may not be taken or possessed except under specific permit. Section 3503.5 of the Code protects all birds-of-prey and their eggs and nests against take, possession, or destruction of nests or eggs.

California Fish and Game Code Sections 1360-1372

CFGC Sections 1360 through 1372 comprise the Oak Woodlands Conservation Act. The act was enacted to protect oak woodland habitats that were being diminished by development, firewood harvesting, and agricultural conversions. The Oak Woodlands Conservation Program was established as a result of the act and is intended to provide project funding opportunities for private landowners, conservation organizations, and cities and counties to conserve and restore oak woodlands. The program authorizes the Wildlife Conservation Board to purchase oak woodland conservation easements and provide grants for land improvements and oak restoration efforts. *CEQA Guidelines* Section 21083.4 requires counties to determine if a project within their jurisdiction may result in conversion of oak woodlands that would have a significant adverse effect on the environment. If the lead agency determines that a project would result in a significant adverse effect on oak woodlands, mitigation measures to reduce the significant adverse effect of converting oak woodlands to other land uses are required.

Native Plant Protection Act

The CDFW also has authority to administer the Native Plant Protection Act (CFGC Section 1900 et seq.). The Native Plant Protection Act requires the CDFW to establish criteria for determining if a species, subspecies, or variety of native plant is endangered or rare. Under Native Plant Protection Act Section 1913(c), the owner of land where a rare or endangered native plant is growing is required to notify the department at least 10 days in advance of changing the land use to allow for salvage of the plant(s).

Natural Communities Conservation Planning Act

The Natural Communities Conservation Planning (NCCP) Act was established by the California Legislature, is directed by the CDFW, and is implemented by the State, as well as public and private partnerships to protect habitat in California. The NCCP Act takes a regional approach to preserving habitat. An NCCP identifies and provides for the regional protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity. Once an NCCP has been approved, CDFW may provide take authorization for all covered species, including fully protected species, CFGC Section 2835.

c. Local Regulations

City of Sebastopol General Plan

The Sebastopol General Plan includes conservation and open space policies to protect natural resources, including, but not limited to:

Goal COS 1: Make Proactive, Forward-Thinking Environmental Protection and Resource Management the Cornerstone of Sebastopol's Identity

Policy COS 1-1: Strive to establish Sebastopol as a leader in environmental protection, environmental stewardship, and sustainability.

Policy COS 1-2: Consider the effects of planning decisions on the overall health and wellbeing of the natural environment and regional ecosystems.

Policy COS 1-3: Consider the "Rights of Nature" as a key principle when making planning decisions and reviewing development and infrastructure project applications.

Policy COS 1-4: Recognize that all life within all ecosystems on our planet are deeply intertwined, and consider the inherent values of ecological goods and services as key principles when making planning decisions.

Actions in Support of Goal COS 1

Action COS 1a: Implement the policies and actions in the Conservation and Open Space Element, and all other relevant and applicable policies and actions throughout the General Plan, to provide for progressive, effective, and forward-thinking strategies to protect the natural environment and promote sustainability to the greatest extent feasible.

Action COS 1b: Consider the establishment and adoption of a Rights of Nature Ordinance. Consideration should include legal, economic, and human implications of such an ordinance, a timeline for implementation, and standards to provide for robust environmental protection measures, while balancing the other social, economic, and community priorities established by the General Plan.

Goal COS 2: Protect and Enhance Sebastopol's Ecosystem and Natural Habitats

Policy COS 2-1: Protect and enhance sensitive habitats, which include creek corridors, wetlands, vernal pools, riparian areas, wildlife and fish migration corridors, native plant nursery sites, waters of the United States, sensitive natural communities, and other habitats designated by State and Federal agencies.

Policy COS 2-2: Preserve and enhance Sebastopol's and the region's natural habitats and rich biodiversity including, but not limited to, grasslands, freshwater marshes, wetlands, vernal pools, riparian areas, aquatic habitat, oak woodlands, and agricultural lands.

Policy COS 2-3: Focus conservation efforts on high priority conservation areas that contain suitable habitat for native, endangered, threatened, migratory, or special-status species and that can be managed with minimal interference from nearby urban land uses and are in proximity to other habitat corridors.

Policy COS 2-4: Attempt to resolve conflicts between sensitive habitat areas and adjoining urbanized lands in a manner which recognizes the public interests in both resource protection and the need to provide for residential and job-generating land uses.

Policy COS 2-5: Implement a range of measures and tools in order to protect, enhance and restore environmentally sensitive areas.

Policy COS 2-6: Maintain Zoning Ordinance provisions to ensure that development proposals for land which is located within, or adjacent to, an environmentally sensitive area include a resources analysis that contains all of the information required in order for the City to determine that impacts to sensitive habitat and natural resources have been reduced, avoided, or mitigated to the greatest extent feasible. The required content for the resources analysis is detailed in Action COS-2a.

Policy COS 2-7: Support efforts to eradicate invasive and noxious weeds and vegetation on public and private property.

Actions in Support of Goal COS 2

Action COS 2a: Maintain Zoning Ordinance provisions to require development project proposals, infrastructure projects, long-range planning projects, and other projects that may potentially impact special-status species and sensitive resources to submit a resources analysis as part of the project application which determines whether significant adverse impacts will occur. Evaluations shall be carried out by a qualified professional biologist approved by the Sebastopol Planning Department, and shall be funded by the project applicant. Generally, the resources analysis shall identify, describe, and locate, the following:

- The type and location of all special-status plant and animal species;
- Riparian vegetation within at least 50 feet of the subject property;
- The location, type, functionality, and offsite connectivity of wetlands, if applicable;
- The location of protected native trees onsite (as defined by the Sebastopol Municipal Code);
- Potential archaeological, cultural, and historical resources, if applicable; and
- Flood hazard areas, as defined by the Federal Emergency Management Agency (FEMA) and/or the Department of Water Resources (DWR).

The resources analysis shall determine, as applicable, the area and location of undeveloped land required to protect and enhance the continued viability of biotic resources, wetlands, and sensitive areas. The resources analysis shall identify land that is functionally a part of the nearby wetlands ecosystem, which should be preserved in a natural state.

Projects shall be designed to avoid impacts to sensitive resources; and in cases where impacts cannot be fully avoided, impacts shall be reduced. Where adverse impacts cannot be feasibly reduced or avoided through project design, projects shall include the implementation of site-specific or project-specific effective mitigation strategies developed by a qualified professional in consultation with state or federal resource agencies with jurisdiction (if applicable) that may include, but are not limited to, the following strategies:

- Preservation of habitat and connectivity of adequate size, quality, and configuration to support the special-status species. Connectivity shall be determined based on the specifics of the species' needs.

- Project design measures, such as clustering of structures or locating project features to avoid known locations of special-status species and/or sensitive habitats.
- Provision of supplemental planting and maintenance of grasses, shrubs, and trees of similar quality and quantity to provide adequate vegetation cover to enhance water quality, minimize sedimentation and soil transport, and provide adequate shelter and food for wildlife.
- Protection for habitat and the known locations of special-status species through adequate buffering or other means to protect habitat functions.
- Provision of replacement habitat of like quantity and quality on- or off-site for special-status species. Preference shall be given to the preservation of habitat on-site or as close to the area of impact as feasible, so long as that habitat is of comparable quality.
- Enhancement of existing special-status species habitat values through restoration and replanting of native plant species.
- Provision of temporary or permanent buffers of adequate size (based on the specifics of the special-status species) to avoid nest abandonment by nesting migratory birds and raptors associated with construction and site development activities.
- Incorporation of the provisions or demonstration of compliance with applicable recovery plans for federally listed species.
- Monitoring of construction activities by a qualified biologist to avoid impacts to on-site special status species.

Action COS 2b: Where sensitive biological habitats have been identified on or immediately adjacent to a project site, the project shall include appropriate mitigation measures identified by a qualified biologist, which may include, but are not limited to the following:

- Pre-construction surveys for species listed under the State or Federal Endangered Species Acts, or species identified as special-status by the resource agencies, shall be conducted by a qualified biologist;
- Construction barrier fencing shall be installed around sensitive resources and areas identified for avoidance or protection, and to reduce potential soil compaction in sensitive areas; and
- Employees shall be trained by a qualified biologist to identify and avoid protected species and habitat.

Action COS 2c: During the development review process, require project applicants to incorporate specific measures into project plans and specifications that are intended to prevent invasive and noxious weeds and vegetation from establishing on the project site. **Action COS 2d:** Through coordination with the U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and Sonoma County, continue to maintain and periodically update, a map of sensitive biological communities and habitat within the Sebastopol Planning Area. Ensure that this map and associated information is readily available to potential developers and the public.

Goal COS 6: Conserve, Protect, and Enhance Trees and Native Vegetation

Policy COS 6-1: Conserve existing native vegetation where possible and integrate regionally native plant species into development and infrastructure projects where appropriate.

Policy COS 6-2: Require the use of primarily locally-sourced native and drought-tolerant plants and trees for landscaping on public projects, if feasible, and strongly encourage their use for landscaping on private projects.

Policy COS 6-3: Avoid removal of large, mature trees that provide wildlife habitat or contribute to the visual quality of the environment through appropriate project design and building siting. If full avoidance is not possible, prioritize planting of replacement trees on-site over off-site locations. Replacement trees for high-quality mature trees should generally be of like kind, and provide for comparable habitat functionality, where appropriate site conditions exist.

Policy COS 6-4: Facilitate the preservation of existing trees, the planting of additional street trees, and the replanting of trees lost through disease, new construction or by other means.

Policy COS 6-5: Require new development to incorporate trees in landscape plans.

Actions in Support of Goal COS 6

Action COS 6a: Make available a list of plants and trees native to the region that are suitable for use in landscaping. The plant and tree species should be drought tolerant, available from local sources, and consideration should be given to the suitability of the plant and tree species for use as habitat to native animals, birds, and insects. The list should be provided online in a user-friendly format, and staff should direct project applicants to the list during site design review and approval.

Action COS 6b: Continue to implement the Tree Protection Ordinance, which protects substantial trees, provides for removals in specified circumstances, and which requires a Tree Protection Plan (TPP) prepared by a certified arborist for projects that may affect protected trees.

Action COS 6c: Review and possibly revise the Tree Protection Ordinance in order to strengthen monitoring provisions for re-planting efforts, in order to ensure the long-term health and viability of replanted trees. Revisions should also address the current fee structure for violations of the TPP to ensure that violations are more costly than compliance with the TPP requirements.

Action COS 6d: Prepare and adopt a Street Tree Planting and Management Program establishing varieties, size and spacing requirements, maintenance standards, and priority planting schedules. This program shall give priority to those streets with heavy vehicular traffic and those which link open space and activity centers. The program shall ensure that trees provide adequate shade and are integrated into parking lots and community spaces in such a manner that tree health is maintained in the long term.

Action COS 6e: Continue requiring the planting of trees in parking lots to provide shade and visual screening.

City of Sebastopol Municipal Code

The Sebastopol Municipal Code Chapter 8.12, *Tree Protection*, requires a permit for the removal of "Protected native trees", with a minimum diameter at breast height (DBH) of 10 inches if it has a single trunk, or which has at least one trunk with a minimum DBH of 10 inches if the tree has two or more trunks, on all properties other than single-family or duplex residential properties, and with a minimum DBH of 20 inches on single-family or duplex properties, and which is also a member of any of the following species:

- Bigleaf maple (*Acer macrophyllum*)
- Box elder (*Acer negundo* ssp. *Californica*)
- Buckeye (*Aesculus californica*)
- White alder (*Alnus rhombifolia*)
- Madrone (*Arbutus menziesii*)
- Hawthorne (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- Douglas fir (*Pseudotsuga menziesii*)
- Coast live oak (*Quercus agrifolia*)
- Oregon oak (*Quercus garryana*)
- Black oak (*Quercus kelloggii*)
- Valley oak (*Quercus lobata*)
- Any naturally occurring hybrid of Quercus species listed above
- California bay (*Umbellularia californica*)
- Sandbar willow (*Salix hindsiana*)
- Yellow willow (*Salix lasiolepis*)
- Red willow (*Salix laevigata*)
- Coast redwood[1] [2] (*Sequoia sempervirens*)
- Tanbark oak (*Lithocarpus densiflora*)
- California black walnut (*Juglans hindsii*)

A Tree Protection Plan prepared by an International Society of Arboriculture (ISA) certified arborist is required as a part of the materials submitted with applications for a tentative map, use permit, variance, design review, encroachment permit, grading permit, or building permit where the proposed work will be located within the dripline of any tree for which a tree removal permit would be required. The Tree Protection Plan must include the size, species, state of health, estimated crown diameter, and accurate trunk location of all trees whose dripline is within the development area. Additionally, the plan must describe the proposed measures to protect to remain onsite, proposed landscaping within the dripline of protected native trees, proposed replacement trees, landscape maintenance, and the proposed grading and drainage plans. Additional requirements to protect trees include Environmentally Sensitive Area fencing and non-entry within driplines of protected trees during construction.

[1] Generally not appropriate as a replacement tree. Therefore, if proposed as a replacement tree, the request should be reviewed and approved by the City Arborist.
[2] Not indigenous to Sebastopol. However, this species is perceived by the public to be native to the area.

Replacement trees are selected from the following list of approved trees based on the recommendations, or approved alternates, with approval from the Design Review Board with recommendations from Planning staff and the City Arborist.

- Amur maple (*Acer ginnala*)
- Big leaf maple
- Black oak
- California bay
- Chinese elm (*Ulmus parvifolia*)
- Chinese pistache (*Pistacia chinesis*)
- Coast live oak
- Crape myrtle (*Lagerstroemia indica*)
- Gravenstein apple (*Malus Gravenstein*)
- Interior live oak (*Quercus wislizenii*)
- Japanese maple (*Acer palmatum*)
- Madrone
- Oregon ash
- Port Orford cedar (*Chamaecyparis lawsoniana*)
- Red alder (*Alnus oregona*)
- Red oak (*Quercus rubra*)
- Trident maple (*Acer buergeranum*)
- Western redbud (*Cercis occidentalis*)
- Western red cedar (*Thuja plicata*)
- Valley oak

4.3.3 Impact Analysis

a. Significance Thresholds and Methodology

The impact analysis is based on the existing biological resources documented in the BRA (Integral 2023; Appendix C) and Rincon's literature review of CDFW's CNDDB, and CNPS's Inventory of Rare and Endangered Plants of California, described above. Project impacts to biological resources are focused upon rare, threatened, endangered species, or species listed under *CEQA Guidelines* Section 15380.

According to Appendix G of the *CEQA Guidelines*, a proposed project would have a significant impact on biological resources if the project would:

1. 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 Game or U.S. Fish and Wildlife Service
2. 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 Game or US Fish and Wildlife Service

3. 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
4. Interfere substantially (i.e., direct/indirect reduction) 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
5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
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

b. Project Impacts and Mitigation Measures

Threshold 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?

Impact BIO-1 **THE PROJECT WOULD HAVE A SUBSTANTIAL ADVERSE EFFECT ON SPECIAL STATUS ANIMAL SPECIES. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION.**

The BRA and database searches identified 78 special-status plant species that have the potential to occur within the nine-quad search radius. None of these species are expected to occur onsite as none were identified during the reconnaissance survey and associated habitats were not present within the project site.

The BRA and database searches identified 30 special-status wildlife species that have the potential to occur within the nine-quad search radius. Four special-status wildlife species were identified as having potential to occur within the project site due to the location within the species known range, presence of potentially suitable habitat, species occurrence records in the vicinity of the project site. Two species, Townsend's big-eared bat and pallid bat, are not further evaluated as they have a low potential to occur while day roosting or foraging.

Western bumble bee has a moderate potential to occur onsite. Impacts to western bumble bee may occur if a colony or foraging individuals are present and could be injured or killed during construction. This species is a candidate for listing under the CESA, and “take” authorization would be required for impacts. Therefore, impacts would be potentially significant and mitigation measures would be required.

If western red bat maternity colonies are present on or near the site during construction, direct impacts could include injury or mortality from construction activity and roost abandonment from construction noise, dust, and other project activities. Therefore, impacts to western red bat would be potentially significant and mitigation measures would be required.

Non-game migratory birds and native birds protected by CFGC Section 3503 and the MBTA are likely to nest within existing trees located along the western boundary of the project site and along the traversing slope within the project site. These trees are proposed for removal, which would impact nesting birds if active nests are present on site, through nest abandonment or destruction. Impacts may also occur if active nests are present in undeveloped and landscaped areas adjacent to active construction or staging through disturbance and nest abandonment. Therefore, impacts would be potentially significant and mitigation measures would be required.

Mitigation Measures

BIO 1(a) Western Bumble Bee Preconstruction Survey

A qualified biologist(s) shall conduct a pre-construction survey for western bumble bee prior to the onset of work activities at the project site. The pre-construction survey effort shall be conducted for a minimum of one hour. If bumble bees of any species are observed, they shall be photographed for identification following the USFWS guidance in Appendix A *Standardized Bee Photography in the Survey Protocols for the Rusty Patched Bumble Bee* (*Bombus affinis*) (USFWS 2019). If construction begins between March 1 and November 1, the ground shall also be searched during the survey for active bumble bee colonies. No capture or handling of bumble bees shall be conducted, and western bumble bee, if identified, shall be avoided during construction. Foraging bees shall be allowed to leave work areas undisturbed.

BIO-1(b) Roosting Bat Surveys and Avoidance

Prior to tree removal or ground disturbance, a qualified biologist shall conduct a focused survey of all trees within the project site, to determine whether active roosts of special status bats are present. If tree removal is planned for the fall or winter, the survey shall be conducted in September to ensure tree removal would have adequate time to occur outside periods of hibernation and during seasonal periods of bat activity (March 1 to April 15, September 1 to October 15, or in any month when evening temperatures rise above 45 degrees Fahrenheit and/or no more than 0.5 inch of rainfall within 24 hours occurs, as described below). If tree removal is planned for the spring, then the survey shall be conducted during the earliest feasible time in March to allow for suitable conditions for the detection of bats, and subsequent tree removal. Trees containing suitable potential bat roost habitat features shall be clearly marked or identified. If day roosts are found to be potentially present, the biologist shall prepare a site-specific roosting bat protection plan to be implemented by the contractor following the City's approval. The plan shall incorporate the following guidance as appropriate:

1) When feasible, removal of trees and structures identified as suitable roosting habitat shall be seasonally timed to avoid disturbance during the hibernation and breeding seasons, including the following:
    a) Between September 1 and about October 15, or before evening temperatures fall below 45 degrees Fahrenheit and/or more than 0.5 inch of rainfall within 24 hours occurs.
    b) Between March 1 and April 15, or after evening temperatures rise above 45 degrees Fahrenheit and/or no more than 0.5 inch of rainfall within 24 hours occurs.
2) If a tree must be removed during the breeding season and is identified as potentially containing a maternity roost, then a qualified biologist shall conduct visual or acoustic emergence surveys or implement other appropriate methods as determined by the biologist to further evaluate if the roost is an active maternity roost. If it is determined that an active maternity roost of a colonial roosting species is present, the roost shall not be disturbed during the breeding season (April 15 to August 31). If it is determined to not be an active maternity roost, the tree or structure may be removed under the guidance of the qualified biologist.

3) Potential non-colonial hibernation roosts shall only be removed during seasonal periods of bat activity outside the hibernation and breeding seasons. Potential non-colonial roosts that cannot be avoided shall be removed on warm days in late morning to afternoon when any bats present are likely to be warm and able to fly. Appropriate methods as determined by the qualified biologist shall be used to minimize the potential harm to bats during tree or structure removal. For trees, such methods may include using a two-step tree removal process. This method is conducted over two consecutive days and works by creating noise and vibration by cutting non-habitat branches and limbs from habitat trees using chainsaws only (i.e., no excavators or other heavy machinery) on the first day with the remainder of tree removal occurring on the second day.[3]

BIO-1(c) Nesting Bird Survey

If construction, vegetation trimming, or tree removals are scheduled to occur during the nesting bird season (February 1 through August 31), the project applicant shall retain a qualified biologist to conduct a pre-construction nesting bird survey no more than 14 days prior to the start of construction to determine the presence/absence of nesting birds and raptors within the project site and adjacent areas. The survey shall include the entire site plus a 100-foot buffer, as accessible. If active nests are found, the qualified biologist shall establish an appropriate avoidance buffer, considering the species sensitivity and physical location of the nest (e.g., line of site to the work area), to comply with CFGC 3503 and 3503.5. The buffer shall be at least 50 feet for non-raptor bird species and 250 feet for raptor species, unless a smaller buffer is determined protective of nesting birds by the qualified biologist. To prevent encroachment, the established buffer(s) shall be clearly marked by high visibility material installed by the contractor. The established buffer(s) shall remain in effect until the young have fledged or the nest has been abandoned as confirmed by the qualified biologist. The City shall review and approve the biologists' findings and buffer during construction, as appropriate.

Significance After Mitigation

Implementation of Mitigation Measure BIO-1(a) would identify whether western bumble bee are present on site and would require avoidance of this species, if necessary. Mitigation Measure BIO-1(b) would identify whether western red bat are present, and require avoidance of maternal colonies, if necessary. Mitigation Measure BIO-1(a) would identify nesting birds and would establish avoidance buffers around nesting birds, if present, to avoid direct impacts including nest abandonment and mortality. These mitigation measures would reduce impacts from construction activities on special status animal species to less than significant.

[3] In our experience, the noise and vibration disturbance, together with the visible alteration of the tree, is very effective in causing bats that emerge nightly to feed to not return to the roost that night.

Threshold 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?
Threshold 3:	Would the project 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?
Threshold 4:	Would the project 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?

Impact BIO-2 THE PROJECT WOULD NOT HAVE A SUBSTANTIAL ADVERSE EFFECT ON ANY RIPARIAN HABITAT OR OTHER SENSITIVE NATURAL COMMUNITY, AND THE PROJECT WOULD NOT HAVE A SUBSTANTIAL ADVERSE EFFECT ON STATE OR FEDERALLY PROTECTED WETLANDS. THE PROJECT WOULD NOT 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. THERE WOULD BE NO IMPACT.

No sensitive natural communities are present on the project site. No adverse effect on sensitive natural communities would occur as a result of project activities. No wetlands or other potentially jurisdictional features occur within or adjacent to the project area. No impacts to jurisdictional wetlands or waters would occur. The project site consists of developed and disturbed areas with primarily ornamental vegetation. Land use in the vicinity is primarily residential or agricultural with no connectivity to natural habitats and the project site is not expected to support wildlife movement. Although Laguna de Santa Rosa is a regional corridor for wildlife movement east of the site, the site itself does not contain suitable natural areas that would contribute to a migratory corridor for wildlife. No impacts to wildlife movement corridors would occur as a result of project activities.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

No impact would occur.

Threshold 5:	Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Impact BIO-3 THE PROJECT COULD CONFLICT WITH THE CITY OF SEBASTOPOL MUNICIPAL CODE TREE PROTECTION ORDINANCE. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION.

A total of 133 trees greater than six inches occur on the project site, 91 of which are over 10 inches and are protected under the City's Municipal Code. Twenty-two (22) protected trees would be removed as a result of project implementation. Removed species include coast live oak, Duglas fir, and coast redwood. Existing oak trees and redwoods would be preserved to the maximum extent possible. The project applicant would be required to comply with the Sebastopol Municipal Code Chapter 8.12, *Tree Protection*, which would include a review of tree removal plans, landscape plans, and specification of a tree replacement ratio by the Planning staff or the City Arborist during the project design review. Pending approval, removed trees must be replaced with an approved tree species on the approved tree List. The project proposes planting replacement trees on site including big leaf maple, madrone, sycamore, and California bay. Through approval of the tree removal permit and corresponding tree mitigation requirements, the project would not conflict with local policies or ordinances protecting biological resources. Impacts would be less than significant with mitigation.

Mitigation Measures

BIO-2 Tree Replacement

All protected ordinance-sized trees removed from the project site shall be replaced as appropriate for the size class and species of the tree removed, based on the City of Sebastopol tree mitigation requirements for protected native trees, as determined by the Tree Board or the City Arborist. Two replacement trees shall be either planted onsite for each protected tree removed or at a City-approved offsite location, or a fee of $75 per replacement tree would be provided to the City of Sebastopol tree fund in-lieu for off-site tree planting in the community. If onsite/offsite planting is implemented, a replacement tree planting plan shall be approved by the City along with landscape plans prior to project implementation.

Significance After Mitigation

Implementation of Mitigation Measure BIO-2 would require compliance with the Sebastopol Municipal Code Section 8.12, therefore there would be no conflicts with

Threshold 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?

Impact BIO-4 THE PROJECT WOULD NOT CONFLICT WITH THE PROVISIONS OF AN ADOPTED HABITAT CONSERVATION PLAN, NATURAL COMMUNITY CONSERVATION PLAN, OR OTHER APPROVED LOCAL, REGIONAL, OR STATE HABITAT CONSERVATION PLAN. THERE WOULD BE NO IMPACT.

The project site does not occur within any Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, no impacts would occur.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

No impact would occur.

4.3.4 Cumulative Impacts

The geographic scope for cumulative biological resources impacts includes the areas surrounding the project site, including incorporated Sebastopol and unincorporated Sonoma County lands within approximately 10 miles of the City. This geographic scope is appropriate for biological resources because it encompasses the mosaic of representative land cover and habitat types (and associated biological resources) affected by the project, including primarily urban, residential, commercial, and industrial development with areas of natural habitats.

The planned and pending projects in the project vicinity are listed in Table 3-1 of Section 3, *Environmental Setting*. Cumulative development in the area could contribute to the loss of habitat for special-status species and the decline of special-status species, cause further fragmentation of habitat and isolation of populations, and decrease movement opportunities. Together, cumulative projects could result in the degradation of the suite of habitat types and associated biological resources, including special-status plant and wildlife species, that occur within the cumulative setting and could result in overall diminished regional ecological functions and values. Impacts to biological resources would most likely be mitigated on a project-by-project basis. However, permanent losses of sensitive habitats, including sensitive natural communities and listed species, would be a potentially significant cumulative impact.

Project implementation would alter the open nature of the site to residential uses and alter the intensity of existing land uses, although the site only supports limited habitat for special-status species. The project would have no impact to riparian habitat, sensitive natural communities, protected wetlands, wildlife movement, or wildlife nursery sites. The presence of flowering plants, open space, and mature trees on site could result in project-level impacts to bumble bees, bats, and nesting birds; however, Mitigation Measure BIO-1(a) would identify if western bumble bee are present, and require avoidance, BIO1(b) would require a roosting bat survey and avoidance, and BIO1(c) would require a nesting bird survey and avoidance; collectively, these measure would reduce impacts to special status species to a less than significant level. Mitigation Measure BIO-2 would require replacement of native protected trees. As such, the project's contribution to cumulative impacts would not be cumulatively considerable.

4.4 Cultural Resources

This section analyzes the proposed project's potential impacts related to cultural resources, including historical built environment and archeological resources, and human remains. The analysis in this section is based, in part, on a Cultural Resource Evaluation prepared for the project by Archaeological Resource Management in June 2023. The full report is provided in Confidential Appendix E of this EIR.

4.4.1 Regulatory Setting

This section includes a discussion of the applicable state and local laws, ordinances, regulations, and standards governing cultural resources, which must be adhered to before and during implementation of the proposed project.

a. Federal Regulations

National Register of Historic Places

Although the project does not have a federal nexus, properties which are listed in or have been formally determined eligible for listing in the NRHP are automatically listed in the CRHR. The following is therefore presented to provide applicable regulatory context. The NRHP was authorized by Section 101 of the National Historic Preservation Act and is the nation's official list of cultural resources worthy of preservation. The NRHP recognizes the quality of significance in American, state, and local history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects. Per 36 CFR Part 60.4, a property is eligible for listing in the NRHP if it meets one or more of the following criteria:

Criterion A: Is associated with events that have made a significant contribution to the broad patterns of our history

Criterion B: Is associated with the lives of persons significant in our past

Criterion C: Embodies the distinctive characteristics of a type, period, or method of installation, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction

Criterion D: Has yielded, or may be likely to yield, information important in prehistory or history

In addition to meeting at least one of the above designation criteria, resources must also retain integrity. The National Park Service recognizes seven aspects or qualities that, considered together, define historic integrity. To retain integrity, a property must possess several, if not all, of these seven qualities, defined as follows:

Location: The place where the historic property was constructed or the place where the historic event occurred

Design: The combination of elements that create the form, plan, space, structure, and style of a property

Setting: The physical environment of a historic property

Materials: The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property

Workmanship: The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory

Feeling: A property's expression of the aesthetic or historic sense of a particular period of time

Association: The direct link between an important historic event or person and a historic property

Certain properties are generally considered ineligible for listing in the NRHP, including cemeteries, birthplaces, graves of historical figures, properties owned by religious institutions, relocated structures, or commemorative properties. Additionally, a property must be at least 50 years of age to be eligible for listing in the NRHP. The National Park Service states that 50 years is the general estimate of the time needed to develop the necessary historical perspective to evaluate significance (National Park Service 1997:41). Properties which are less than 50 years must be determined to have "exceptional importance" to be considered eligible for NRHP listing.

b. State Regulations

California Environmental Quality Act

California Public Resources Code (PRC) Section 21804.1 requires lead agencies to determine if a project could have a significant impact on historical or unique archaeological resources. As defined in PRC Section 21084.1, a historical resource is a resource listed in, or determined eligible for listing in, the California Register of Historical Resources (CRHR), a resource included in a local register of historical resources or identified in a historical resources survey pursuant to PRC Section 5024.1(g), or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant. PRC Section 21084.1 also states resources meeting the above criteria are presumed to be historically or culturally significant unless the preponderance of evidence demonstrates otherwise. Resources listed in the National Register of Historic Places (NRHP) are automatically listed in the CRHR and are, therefore, historical resources under CEQA. Historical resources may include eligible built environment resources and archaeological resources of the precontact or historic periods.

CEQA Guidelines Section 15064.5(c) provides further guidance on the consideration of archaeological resources. If an archaeological resource does not qualify as a historical resource, it may meet the definition of a "unique archaeological resource" as identified in PRC Section 21083.2. PRC Section 21083.2(g) defines a unique archaeological resource as an artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria: 1) it contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information, 2) has a special and particular quality such as being the oldest of its type or the best available example of its type, or 3) is directly associated with a scientifically recognized important prehistoric or historic event or person.

If an archaeological resource does not qualify as a historical or unique archaeological resource, the impacts of a project on those resources will be less than significant and need not be considered further (CEQA Guidelines Section 15064.5[c][4]). CEQA Guidelines Section 15064.5 also provides guidance for addressing the potential presence of human remains, including those discovered during the implementation of a project.

According to CEQA, an impact that results in a substantial adverse change in the significance of a historical resource is considered a significant impact on the environment. A substantial adverse change could result from 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 (CEQA Guidelines §15064.5 [b][1]). Material impairment is defined as demolition or alteration in an adverse manner [of] those characteristics of a historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the CRHR or a local register (CEQA Guidelines §15064.5[b][2][A]).

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that resources cannot be left undisturbed, mitigation measures are required (PRC §21083.2[a][b]).

Section 15126.4 of the CEQA Guidelines stipulates an EIR shall describe feasible measures to minimize significant adverse impacts. In addition to being fully enforceable, mitigation measures must be completed within a defined time period and be roughly proportional to the impact of the project. Generally, a project which is found to comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (the Standards) is considered to be mitigated below a level of significance (CEQA Guidelines Section 15126.4 [b][1]). For historical resources of an archaeological nature, lead agencies should also seek to avoid damaging effects where feasible. Preservation in place is the preferred manner to mitigate impacts to archaeological sites; however, data recovery through excavation may be the only option in certain instances (CEQA Guidelines Section 15126.4[b][3]).

California Register of Historical Resources

The CRHR was established in 1992 and codified by PRC §§5024.1 and 4852. The CRHR is an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change (Public Resources Code, 5024.1(a)). The criteria for eligibility for the CRHR are consistent with the NRHP criteria but have been modified for state use in order to include a range of historical resources that better reflect the history of California (Public Resources Code, 5024.1(b)). Unlike the NRHP however, the CRHR does not have a defined age threshold for eligibility; rather, a resource may be eligible for the CRHR if it can be demonstrated sufficient time has passed to understand its historical or architectural significance (California Office of Historic Preservation 2006). Furthermore, resources may still be eligible for listing in the CRHR even if they do not retain sufficient integrity for NRHP eligibility (California Office of Historic Preservation 2006). Generally, the California Office of Historic Preservation recommends resources over 45 years of age be recorded and evaluated for historical resources eligibility (California Office of Historic Preservation 1995:2).

A property is eligible for listing in the CRHR if it meets one of more of the following criteria:

Criterion 1: Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage

Criterion 2: Is associated with the lives of persons important to our past

Criterion 3: 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

Criterion 4: Has yielded, or may be likely to yield, information important in prehistory or history

California Health and Safety Code

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 if 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.

California Public Resources Code §5097.98

Section 5097.98 of the California Public Resources Code states that the NAHC, upon notification of the discovery of Native American human remains pursuant to Health and Safety Code §7050.5, shall immediately notify those persons (i.e., the Most Likely Descendant [MLD]) that it believes to be descended from the deceased. With permission of the landowner or a designated representative, the MLD may inspect the remains and any associated cultural materials and make recommendations for treatment or disposition of the remains and associated grave goods. The MLD shall provide recommendations or preferences for treatment of the remains and associated cultural materials within 48 hours of being granted access to the site.

c. Local Regulations

Sebastopol Municipal Code 2016

Chapter 17.150 Cultural Heritage of the City of Sebastopol Municipal Code Ordinance authorizes the Planning Commission, or City Council on appeal, to designate (or remove) local landmarks and sites of historic interest by the procedures outlined in the ordinance. Archaeological sites and human remains are not addressed.

Sebastopol General Plan 2016

The Sebastopol General Plan, adopted in 2016, provides a comprehensive framework that guides the City's development. Both the Conservation and Open Space Element and Community Design Element establish goals and policies to protect historic and cultural resources within Sebastopol.

Goal COS 10: Protect and Preserve Sebastopol's Historic and Cultural Resources

Policy COS 10-1: Review proposed developments and work in conjunction with the California Historical Resources Information System, Northwest Information Center at Sonoma State University, to determine whether project areas contain known archaeological resources, either prehistoric and/or historic-era, or have the potential for such resources.

Policy COS 10-2: If found during construction, ensure that human remains are treated with sensitivity and dignity, and ensure compliance with the provisions of California Health and Safety Code and California Public Resources Code.

Policy COS 10-3: Work with Native American representatives to identify and appropriately address, through avoidance or mitigation, impacts to Native American cultural resources and sacred sites during the development review process.

Policy COS 10-4: Consistent with State local and tribal intergovernmental consultation requirements, the City shall consult with Native American tribes that may be interested in proposed new development and land use policy changes.

Policy COS 10-5: Protect important historic resources and use these resources to promote a sense of place and history in Sebastopol.

Policy COS 10-6: Encourage the voluntary identification, conservation, and re-use of historical structures, properties, and sites with special and recognized historic, architectural, or aesthetic value.

Policy COS 10-7: Encourage historic resources to remain in their original use whenever possible. The adaptive use of historic resources is preferred when the original use can no longer be sustained.

Policy COS 10-8: Leverage the City's strong cultural and historic heritage to support and encourage historically-oriented visitor programs and heritage tourism through cooperation with local, regional, and state marketing efforts.

Policy COS 10-9: Continue to support and promote annual festivals and community events that celebrate Sebastopol's cultural heritage.

Policy COS 10-10: Encourage and support community art projects, including murals, sculptures, educational programs, and events that highlight Sebastopol's cultural and historic heritage.

Actions in Support of Goal COS 10:

Action COS 10a: Work with the Federated Indians of the Graton Rancheria to prepare a narrative description of the Native American background of the Sebastopol area and request the Federated Indians of the Graton Rancheria provide pictorial examples of the types of Native American resources present in the vicinity. Place this description on the City's website as a link under the History of Sebastopol section.

Action COS 10b: Require a cultural and archaeological survey prior to approval of any development project where a potential or known historical, archaeological, or other cultural resource is located or which would require excavation in an area that is sensitive for cultural or archaeological resources. If significant cultural or archaeological resources, including historic and prehistoric resources, are identified, the project shall be required to implement appropriate measures, such as avoidance, capping of the resource site, or documentation and conservation, to reduce adverse impacts to the resource to a less than significant level.

Action COS 10c: Require all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources or human remains:

- If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Planning Department shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Planning Department.

- If human remains are discovered during any ground disturbing activity, work shall stop until the Planning Department and the County Coroner have been contacted; if the human remains are determined to be of Native American origin, the Native American Heritage Commission (NAHC) and the most likely descendants have been consulted; and work may only resume when appropriate measures have been taken and approved by the Planning Department.

Action COS 10d: Continue to invite the Federated Indians of the Graton Rancheria, as well as other recognized tribes that express interest, to comment on City projects as part of the environmental review process.

Action COS 10e: Develop a Historic Sebastopol program to identify and protect historic resources, encourage landowners to voluntarily preserve and rehabilitate historical structures, and to provide a coordinated approach to draw visitors and tourists to these areas. The program may include:

- Coordinated signage and identifying placards of historic areas, including downtown, specific buildings, and businesses.
- Maps available on-line, at the Chamber of Commerce, and key locations of the City that direct visitors and history aficionados to key historic and cultural resources in the City.
- Establishment of local historic districts (such as the downtown) with standards to conserve historical resources and promote the highest and best use of such resources.
- Property owner incentives for the preservation and restoration of historic buildings and sites. Consider the following incentives: Interest-free or reduced interest loans for rehabilitation work consistent with the original character of the building; tax incentives for the preservation of historic structures, including the use of Mills Act preservation contracts; reduced processing fees for preservation and protection of outstanding buildings; use of the State Historic Building Code where applicable; a brochure that identifies resources to purchase materials and fixtures that are historically accurate in appearance but offer modern benefits (e.g., energy-efficient lighting, windows, building materials that correlate to specific architectural or historic periods that are often seen in the City); and awards and grants for the preservation and protection of outstanding buildings.

Action COS 10f: Develop guidelines for remodels of potentially historic residential structures to ensure that the character and individuality of such residences is maintained. The guidelines should address:

- Design styles, age of home, and other criteria to determine applicability of the guidelines;
- Exterior features that are important and covered by the guidelines (e.g., siding and exterior finishes, windows, doors, roofs, porches, garages, outbuildings, and streetscapes);
- Standards for modifications and renovation, including the extent of changes that can occur; and
- Activities that are exempt from the guidelines, such as interior improvements and routine maintenance and repair.

Action COS 10g: Encourage and support local and non-profit efforts to publicize and educate regarding local history and culture. Key historical resources, groups, and time periods to emphasize may include, but are certainly not limited to: the railroad culture and history; the redwood logging industry; the Pomo Indians and other Native American groups; Mexican and other Latin American immigrants: the Californios; the region's apple farming and processing history; the history and origin of Sebastopol's name; historic Chinatown; and local Japanese-American history.

Action COS 10h: Continue to implement the Cultural Heritage Chapter of the Sebastopol Municipal Code and encourage the protection, restoration, and enhancement of the City's aesthetic and historic attractions and resources.

Action COS 10i: Continue to refer projects to Sonoma State University's Archaeological Resource Center and Western Sonoma County Historical Society.

Action COS 10j: Seek funding for the restoration and preservation of archaeological and historical resources.

The Community Design Element establishes goals and policies to protect historic buildings and historic structures within Sebastopol.

Goal CD 3: Recognize the Value and Ensure the Preservation of Sebastopol's Historical and Cultural Resources

Policy CD 3-1: Ensure historic buildings and resources are preserved for future generations.

Policy CD 3-2: Preserve significant historical structures by encouraging adaptive reuse opportunities of historic buildings for contemporary uses.

Policy CD 3-3: Identify and document historical, cultural, and archeological resources including significant sites and structures.

Policy CD 3-4: Require new development to avoid the disruption of cultural, archeological, and historical resources to the greatest extent feasible.

Policy CD 3-5: Encourage and support an increased public awareness of local cultural and historical resources.

Policy CD 3-6: Ensure that restoration efforts of City owned historic structures adhere to the original architecture style and period detail of the original structure whenever feasible.

Actions in Support of Goal CD 3

Action CD 3a: Work with federal, state, and local agencies, nonprofit organizations, educational institutions, and interested citizens to obtain funding and increase community involvement to enhance and preserve historical sites and structures.

Action CD 3b: Inventory historical and cultural resources and prepare a comprehensive survey of sites and structures including those of architectural significance.

Action CD 3c: Develop and distribute educational guides of places with cultural and historical significance. Educational guides should be accessible for viewing at City Hall, on the City website, or available at the local library whenever possible.

Action CD 3d: Support cultural events that promote the City's cultural history and diversity.

Action CD 3e: Develop a priority list for the restoration and preservation of significant structures in the City.

Action CD 3f: Encourage and assist property owners' restoration efforts whenever feasible. This includes providing preservation guidance for design elements, and assisting in the placement of structures on the National Register of Historic Places.

Action CD 3g: Develop and maintain standard conditions of approval and require, as necessary, CEQA review of development projects to ensure the preservation of historical and cultural resources.

Action CD 3h: Seek funding strategies such as grants and tax incentives (i.e. Mills Act) for historic building rehabilitation, and to promote historic preservation throughout the community.

Action CD 3i: Utilize the City's Cultural Heritage ordinance to recognize historically or culturally significant structures.

4.4.2 Environmental Setting

Indigenous History

The project site lies near the boundary of the Northwest California and San Francisco Bay Area archaeological regions (Milliken et al. 2009 Moratto 1984). Following Milliken et al. (2007), the prehistoric cultural chronology for the area can be generally divided into six periods: The Pleistocene-Holocene Transition (ca. 11,500-8,000 BCE) the Early Holocene (8,000-3,500 BCE), Early (3,500-500 BCE), Lower Middle (500 BCE to 430 CE), the Upper Middle (430-1050 CE), and the Late Period (1050 CE-Contact).

Pleistocene-Holocene Transition (11,500 to 8,000 BCE)

No evidence for human occupation during the Pleistocene-Holocene Transition has been discovered in the Bay Area to date, though early Paleoindian groups likely lived in the area prior to 8,000 BCE (Milliken et al. 2007). Limited finds have been made in the Northwest Coast region, including Post Pattern sites near Clear Lake and Cache Creek in Lake County and isolated finds in Mendocino County and at Bodega Head (Hildebrandt et al. 2007).

Early Holocene (8,000 to 3,500 BCE)

The Early Holocene in the San Francisco Bay Area is characterized by a mobile forager pattern and the presence of millingslabs, handstones, and a variety of leaf-shaped projectile points, though evidence for this period is limited. It is likely that Holocene alluviation buried many prehistoric sites in the area (Moratto 1984; Ragir 1972). Sites such as CA-CCO-696 and CA-CCO-637 in Contra Costa County are two of just a few sites dating to this period. The earliest date for the Early Holocene comes from site CA-CCO-696 at Los Vaqueros Reservoir (Milliken et al. 2007). In Northwest California, the Early Holocene is characterized by the Borax Lake Pattern and the Berkeley Pattern. The Borax Lake Pattern is typically represented by large wide-stemmed projectile points, serrated bifaces, and millingslabs, though no faunal or floral remains have been identified at these sites so diet composition remains unclear (Hildebrandt 2007). The Berkeley Pattern is characterized by long-term settlements, contracting and square-stem points, and the use of pestles for acorn processing.

Early Period (3,500 to 500 BCE)

The Early Period saw increased sedentism from the Early Holocene as indicated by new ground stone technologies (replacement of millingslabs with the mortar and pestle), an increase in regional trade, and the earliest cut-bead horizon. The first documentation of the mortar and pestle, dating to 3,800 BCE, comes from CA-CCO-637 in the Los Vaqueros Reservoir area. By 1,500 BCE, mortars and pestles had almost completely replaced millingslabs and handstones. A shift to a sedentary or semi-sedentary lifestyle is marked by the prevalence of mortars and pestles, ornamental grave associations, and shell mounds. The earliest cut bead horizon, dating to this period, is represented by rectangular *Haliotis* (abalone) and *Olivella* (snail) beads from several sites, including CA-CCO-637 (Los Vaqueros Reservoir), CA-SCL-832 (Sunnyvale), and CA-ALA-307 (Berkeley) (Meyer and Rosenthal 1998; Milliken et al. 2007). The advent of the mortar and pestle indicates a greater reliance on processing nuts such as acorns. Faunal evidence from various sites indicates a diverse diet based on mussel and other shellfish, marine mammals, terrestrial mammals, and birds (D'Oro 2009). In the Northwest Coast region during this period, the Mendocino Pattern is common throughout the area and is categorized by side-notched, corner-notched, and concave-base points and a variety of other stone tools. The Berkeley Pattern has also been recognized for this period, characterized by elaborate points, bone tools, baked clay items, and mortars and pestles (Hildebrandt 2007).

Lower Middle Period (500 BCE to 430 CE)

The Lower Middle Period saw numerous changes from the previous period. Rectangular shell beads, common during the Early Period, disappear completely and are replaced by split-beveled and saucer *Olivella* beads. In addition to the changes in bead types, *Haliotis* ornaments, bone tools and ornaments, and basketry awls indicating coiled basketry manufacture appeared. Mortars and pestles continued to be the dominant grinding tool (Milliken et al. 2007). Evidence for the Lower Middle Period in the Bay Area comes from sites such as the Emeryville shell mound (CA-ALA-309) and Ellis Landing (CA-CCO-295). CA-ALA-309 is one of the largest shell mounds in the Bay Area and contains multiple cultural sequences. The lower levels of the site, dating to the Middle Period, contain flexed burials with bone implements, chert bifaces, charmstones, and oyster shells (Moratto 1984). The Augustine Pattern, characterized by corner-notched projectile points and ornate ceremonial and decorative objects, is recognized at the southern extent of the Northwest Coast region (Hildebrandt 2007).

Upper Middle Period (430 to 1050 CE)

Around 430 CE, at the beginning of the Upper Middle Period, *Olivella* saucer bead trade networks established during earlier periods collapsed and over half of known sites occupied during the Lower Middle Period were abandoned. *Olivella* saucer beads were replaced with *Olivella* saddle beads. New items appear at sites, including elaborate, decorative blades, fishtail charmstones, new *Haliotis* ornament forms, and mica ornaments. Sea otter bones are found more frequently than from earlier periods (Milliken et al. 2007). Excavations at CA-ALA-309 have indicated a shift from oysters to clams at that site. Subsistence analyses at various sites dating to this period indicate a diverse diet that included various species of fish, mammal species, bird species, shellfish, and plant resources that varied by location in the Bay Area (Hylkema 2002).

Late Period (1050 CE to contact)

The Late Period saw an increase in social complexity, indicated by differences in burials, and an increased level of sedentism relative to preceding periods. Small, finely worked projectile points associated with bow and arrow technology appear around 1250 CE. *Olivella* shell beads disappeared and were replaced with clamshell disk beads. The toggle harpoon, hopper mortar, and magnesite tube beads also appeared during this period (Milliken et al. 2007). According to Moratto (1984), this period saw an increase in the intensity of resource exploitation that correlates with an increase in population. Many of the well-known sites of earlier periods, such as the Emeryville shell mound (CA-ALA-309) and the West Berkeley site (CA-ALA-307) were abandoned, possibly due to fluctuating climates and drought that occurred throughout the Late Period (Lightfoot and Luby 2002). In Northwest California during this period, the archaeological record exhibits a high degree of diversity in material culture patterns, site types, and degrees of sedentism. Seasonal Augustine pattern sites have been identified along the Sonoma County Coast, though researchers have argued for a more sedentary settlement system inland (Hildebrandt 2007).

Ethnographic Setting

See Chapter 4.14 *Tribal Cultural Resources*.

Post-Contact Setting

Post-Contact history for the state of California refers to the time after the arrival of Europeans and is generally divided into three periods: the Spanish Period (1769–1822), Mexican Period (1822–1848), and American Period (1848–present). Although Spanish, Russian, and British explorers visited the area for brief periods between 1529 and 1769, the Spanish Period in California begins with the establishment in 1769 of a settlement at San Diego and the founding of Mission San Diego de Alcalá, the first of 21 missions constructed between 1769 and 1823. Independence from Spain in 1821 marks the beginning of the Mexican Period, and the signing of the Treaty of Guadalupe Hidalgo in 1848, ending the Mexican-American War, signals the beginning of the American Period when California became a territory of the United States.

Spanish Period (1769 – 1822)

Spanish explorers made sailing expeditions along the coast of California between the mid-1500s and mid-1700s. In 1952, Juan Rodríguez Cabrillo led the first European expedition to observe what was known by the Spanish as Alta (upper) California. For more than 200 years, Cabrillo and other Spanish, Portuguese, British, and Russian explorers sailed the Alta California coast and made limited inland expeditions, but they did not establish permanent settlements (Bean 1968; Rolle 2003). The Spanish crown laid claim to Alta California based on the surveys conducted by Cabrillo and Vizcaíno (Bancroft 1885; Gumprecht 1999).

By the 18th century, Spain developed a three-pronged approach to secure its hold on the territory and counter against other foreign explorers. The Spanish established military forts known as presidios, as well as missions and pueblos (towns) throughout Alta California. The 1769 overland expedition led by Captain Gaspár de Portolá marks the beginning of California's historic period, occurring just after the King of Spain installed the Franciscan Order to direct religious and colonization matters in assigned territories of the Americas. Portolá established the Presidio of San Diego as the first Spanish settlement in Alta California in 1769. Franciscan Father Junípero Serra also founded Mission San Diego de Alcalá that same year, the first of the 21 missions that would be established in Alta California by the Spanish and the Franciscan Order between 1769 and 1823 (San Diego History and Heritage 2023). Construction of missions and associated presidios was a major emphasis during the Spanish Period in California to integrate the Native American population into Christianity and communal enterprise. Incentives were also provided to bring settlers to pueblos or towns; just three pueblos were established during the Spanish Period, only two of which were successful and remain as California cities (San José and Los Angeles).

Spain began making land grants in 1784, typically to retiring soldiers, although the grantees were only permitted to inhabit and work the land. The land titles technically remained property of the Spanish king (Livingston 1914).

Mexican Period (1822 – 1848)

Several factors kept growth within Alta California to a minimum, including the threat of foreign invasion, political dissatisfaction, and unrest among the indigenous population. After more than a decade of intermittent rebellion and warfare, New Spain won independence from Spain in 1821. In 1822, the Mexican legislative body in California ended isolationist policies designed to protect the Spanish monopoly on trade, and decreed California ports open to foreign merchants (Dallas 1955).

Extensive land grants were established in the interior during the Mexican Period, in part to increase the population inland from the more settled coastal areas where the Spanish had first concentrated their colonization efforts. The secularization of the missions following Mexico's independence from Spain resulted in the subdivision of former mission lands and establishment of many additional ranchos. Commonly, former soldiers and well-connected Mexican families were the recipients of these land grants, which now included the title to the land (Library of Congress 2023). Much of the land along the coast and in the interior valleys became part of Mexican land grants or "ranchos" (Robinson 1948). During the Mexican period there were small towns located where San Francisco (then known as Yerba Buena) and Monterey are situated in the present day. The rancho owners tended to reside either in town or in an adobe house on the rancho itself.

Economic opportunity in northern California was based on seal and sea otter furs as well as cattle hides and tallow (NPS 2015). Russian explorers ventured to northern California from Alaska in search of fur and established Fort Ross. The Russian American Fur Company prospered for thirty years by harvesting seal and otter furs (Sonoma County Permit Sonoma 2023). When extreme hunting decimated sea otter populations, the Russian American Fur Company sold Fort Ross to European immigrant John Sutter in 1841. After the Russians left, the Mexican government quickly monopolized the costal access by giving land grants from Estero de San Antonio to the Gualala River. The number of nonnative inhabitants increased during this period because of the influx of explorers, trappers, and ranchers associated with the land grants. The rising California population contributed to the introduction and rise of diseases foreign to the Native American population, who had no associated immunities.

American Period (1848 – Present)

The United States went to war with Mexico in 1846. During the first year of the war, John C. Fremont traveled from Monterey to Los Angeles with reinforcements for Commodore Stockton and evaded Californian soldiers in Santa Barbara's Gaviota Pass by taking the route over the San Marcos grade instead (Kyle 2002). The war ended in 1848 with the Treaty of Guadalupe Hidalgo, ushering California into its American Period.

California officially became a state with the Compromise of 1850, which also designated Utah and New Mexico (with present-day Arizona) as US territories (Waugh 2003). The discovery of gold initiated the 1849 California Gold Rush, which brought thousands of miners and settlers to the Sierra foothills east and southeast of Sacramento. Agriculture became the major economic interest replacing lumber on the coast. Livestock ranchers held large properties to the north on the coastal plain, just before the Gualala River (Sonoma County Permit Sonoma 2023). Wheat and livestock were major agricultural products but overgrazing and soil erosion forced farmers to pivot to dairy products (Sonoma County Permit Sonoma 2023).

In the mid-1800s, Gravenstein apples were widely planted in Sebastopol and wider Sonoma County (Sonoma County 2023). Due to its cool summers and sandy soils, Sebastopol became a center growing location and major processing center for Gravenstein apples. In more recent years, Gravenstein apple production declined significantly due to suburban development, orchard/vineyard conversion, a global over-abundance of apples, and other factors (Sonoma County 2023).

Rapid population increase occasioned by the Gold Rush of 1849 allowed California to become a state in 1850. Most Mexican land grants were confirmed to the grantees by United States courts, but usually with more restricted boundaries, which were surveyed by the United States Surveyor General's office. Land outside the land grants became federal public land which was surveyed into sections, quarter-sections, and quarter-quarter sections. The federal public land could be purchased at a low fixed price per acre or could be obtained through homesteading after 1862 (Robinson 1948).

Local History

The following was excerpted from the 2016 Sebastopol General Plan (City of Sebastopol 2016), which offers an overview of the city's history since the mid-nineteenth century.

> The City [of Sebastopol] lies near the juncture of two Mexican land grants: Cañada de Jonive and Llano de Santa Rosa. Cañada de Jonive, to the west, a 10,787-acre Mexican land grant, was acquired by James Black from Governor Pío Pico in 1845. In 1849, Black traded this rancho to Jasper O'Farrell for his land grant Ranch Nicasio. O'Farrell married in 1849, and he and his wife settled on the Jonive Rancho, which they renamed the "Annaly Ranch." The spelling of the ranch name was later corrupted to "Analy." The O'Farrells' home was an adobe at the foot of Jonive Hill near the community of Freestone, which was later a store, and fell in 1906. The patent for the Rancho lands was issued in 1858 to Jasper O'Farrell (Hoover, Rensch and Rensch 1970). The Llano de Santa Rosa land grant of 13,361 acres was made to Joaquín Carrillo, a brother-in-law of General Vallejo in 1845 by Governor Manuel Micheltorena. Carrillo built an adobe house near the western edge of the grant in 1846 on what is now Petaluma Avenue. Carrillo became the owner of two hotels in Sebastopol (the Analy and the Pioneer) as well as a saloon and boarding house. In 1871, the patent for the lands was issued to Carrillo. Carrillo lived in Sebastopol until his death in 1899.
>
> The town of Sebastopol was started on the lands between the two ranchos by Joseph H.P. Morris. It was first named "Pine Grove" in 1853. At one point, there were five Sebastopols in California, all named soon after 1854 and the siege of the Russian seaport of that name by British and French forces. This is the only town with this name to survive—Napa's Sebastopol is now Yountville and the Sebastopols in Tulare, Sacramento, and Nevada counties no longer exist. Local tradition places the renaming of the town as a result of a war of words between two parties at the general store, with one party waiting all day for the other to exit the store. When the post office was set to be established in the town, it was found there was already a Pine Grove in California so the name Sebastopol was selected (Gudde 1969; Western Sonoma County Historical Society 2003). The early settlers of the region soon discovered the agricultural value of the land. Early crops included fruit, especially grapes and apples. Hops, cherries and berries later became important crops. Another individual to recognize the importance of the agricultural

value of the area was famed horticulturalist Luther Burbank. He started his work in Santa Rosa in 1878, but rapidly needed more space, and purchased 18 acres near Sebastopol on which he established the Gold Ridge Experimental Farm. He could plant large fields and was able to carry on even more extensive experiments with improvements to various crops through plant breeding, election and hybridization (Hoover, Rensch and Rensch 1970; Western Sonoma County Historical Society 2003). The cottage and three acres of the Gold Ridge Farm are now maintained by volunteers and is associated with the Western Sonoma County Historical Society.

An early connection was established with the completion of the Santa Rosa, Sebastopol & Green Valley Railroad, organized in 1887, and built as a standard gauge line from Santa Rosa to Sebastopol. The rail line was leased to the California Northwestern Railway in 1898 and sold to the Northwestern Railway Company in 1907 (Fickewirth 1992).

The City of Sebastopol was incorporated in 1902, reportedly with the main purpose of taking care of sewage problems. The City acquired land to build a sewage farm along the Laguna de Santa Rosa (Western Sonoma County Historical Society 2003). In 1903, the Petaluma and Santa Rosa Railway Company was incorporated. The electric railway line was started in April of the following year and completed by October 1904. The route provided transportation for Sebastopol residents to Santa Rosa, connecting to points beyond, especially with overnight freight service to San Francisco. The railroad line provided a means of quickly getting produce, lumber and dairy products to a wider market, as well as a means for more efficiently getting goods to Sebastopol. As with the electric railway systems in other areas, the automobile brought about the end of the system in the 1920s and 1930s. People preferred personal automobiles, eliminating the passenger carrying needs, and trucking allowed the economical shipment and delivery of goods and products. The original wooden depot built in Sebastopol for the railway in 1904, was replaced in 1917 by a stucco and stone building. This building is currently the site of the West County Museum, preserving and interpreting the history of the region (Western Sonoma County Historical Society 2003).

Currently, the City of Sebastopol has a population of approximately 7,800 people and serves a trade area population in excess of 50,000 people. The City is located in a region that produces the majority of the world's supply of Gravenstein apples and has become a significant grape-growing region for high quality wine. The city is also popular gateway to the Russian River and its surrounding redwood forests, as well as Bodega and Jenner's coastal recreation areas (City of Sebastopol 2023).

4.4.1 Existing Conditions

This section analyzes the project's potential impacts related to cultural resources, including historical built environment and archaeological resources as well as human remains. The analysis in this section is based, in part, on the Cultural Resource Evaluation prepared for the project by Archaeological Resource Management in June 2023. The investigation consisted of a California Historical Resources Information System (CHRIS) records search of the project site as well as a 0.25-mile radius around the project site at the Northwest Information Center (NWIC), a geoarchaeological sensitivity review, and a surface reconnaissance survey of the project site.

The NWIC records search identified 10 previously recorded cultural resources within a 0.25-mile radius of the project site, none of which overlap the project site. One built environment resource, a historic-period residence, was previously documented adjacent to the project site; however, this resource was recommended as ineligible for the NRHP and is no longer present. No built environment or archaeological resources were observed within the project site during the survey. However, the geoarchaeological review indicates that the project site is located less than a mile from a permanent water source (Laguna De Santa Rosa) on a Holocene era alluvial floodplain, which suggests that the project site generally has the potential for subsurface cultural deposits.

On May 25, 2025, a search of the Sacred Lands File (SLF) by the Native American Heritage Commission (NAHC) was requested on behalf of the City. The NAHC responded to the request on June 20, 2023, stating that the results of the SLF search were positive.

4.4.2 Impact Analysis

a. Methodology and Significance Thresholds

If a project may cause a substantial adverse change in the characteristics of a resource that convey its significance or justify its eligibility for inclusion in the CRHR or a local register, either through demolition, destruction, relocation, alteration, or other means, then the project would have a significant effect on the environment (CEQA Guidelines §Section 15064.5[b]). Impacts would be significant if the project would:

1. Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5;
2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5; or
3. Disturb any human remains, including those interred outside of formal cemeteries.

Threshold 1 broadly refers to historical resources. To more clearly differentiate between archaeological and built environment resources, analysis under Threshold 1 has been limited to built environment resources. Archaeological resources, including those that may be considered historical resources pursuant to Section 15064.5 and those that may be considered unique archaeological resources pursuant to Section 21083.2, are considered under Threshold 2.

Direct impacts can be assessed by identifying the types and locations of proposed development, determining the exact locations of cultural resources within the project area, assessing the significance of the resources that may be affected, and determining the appropriate mitigation. Removal, demolition, or alteration of historical resources can permanently impact the historic fabric of an archaeological site, structure, or historic district.

The State Legislature, in enacting the CRHR, amended CEQA to clarify which properties are significant, as well as which project impacts are considered to be significantly adverse. A project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have significant effect on the environment (CEQA Guidelines §Section 150645[b]). A substantial adverse change in the significance of a historical resource means demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired (CEQA Guidelines §Section 150645[b][1]).

The CEQA Guidelines further state that "[t]he significance of an historical resource is materially impaired when a project… [d]emolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in the California Register … local register of historic resources… or its identification in an historic resources survey." As such, the test for determining whether or not the project will have a significant impact on identified historical resources is whether it will materially impair physical integrity of the historic resource such that it could no longer be listed in the CRHR or a local landmark program.

b. Project Impacts and Mitigation Measures

Threshold 1:	Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

Impact CUL-1 THE PROJECT WOULD NOT CAUSE A SUBSTANTIAL ADVERSE CHANGE IN THE SIGNIFICANCE OF A HISTORICAL RESOURCE, AS THERE ARE NO SUCH RESOURCES ON THE PROJECT SITE. THERE WOULD BE NO IMPACT.

As outlined above in *Section 4.4.1, Existing Conditions*, no built environment historical resources were identified as a result of the cultural resources evaluation conducted for the project. Therefore, the project would result in no impact to historical resources as defined in Section 15064.5(b) of the CEQA Guidelines.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

There would be no impact to historical resources.

Threshold 2:	Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Impact CUL-2 GRADING AND EXCAVATION REQUIRED FOR THE PROPOSED PROJECT WOULD HAVE THE POTENTIAL TO UNEARTH AND ADVERSELY CHANGE OR DAMAGE PREVIOUSLY UNIDENTIFIED HISTORICAL AND ARCHAEOLOGICAL RESOURCES. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH IMPLEMENTATION OF MITIGATION.

According to the California Office of Historic Preservation, any physical evidence of human activities over 45 years of age can be recorded and evaluated for consideration as historical resources (California Office of Historic Preservation 1995). This includes not only buildings, but also structures, objects, sites, and districts.

The results of the NWIC records search identified 10 previously recorded cultural resources within a 0.25-mile radius of the project site, none of which overlap the project site. Similarly, no cultural resources were observed during the surface reconnaissance survey of the project site. However, the lack of surface evidence of archaeological materials does not preclude their subsurface existence. The project site is situated on an alluvial plain relatively close to a permanent water source and the sediments date to the Holocene, the age of human occupation. Moreover, the results of the SLF search were positive for Sacred Lands. As such, the project site is considered to be moderately sensitive for subsurface archaeological deposits.

It is possible that unanticipated archaeological deposits and/or human remains could be encountered and damaged during the ground-disturbing activities associated with construction (such as grading and excavation). Grading within the project site could unearth and either damage or destroy buried or otherwise unknown subsurface cultural resources. Likewise, excavation required for installation of utilities, such as sanitary sewer pipeline to serve the proposed project within the project site could also encounter and either damage or destroy unknown subsurface cultural resources, if present. The potential damage or destruction of cultural resources would be considered a potentially significant impact.

Action COS 10c of the 2016 Sebastopol General Plan requires all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources:

- If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Planning Department shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Planning Department.

While Action COS 10c broadly addresses work stoppage in the event of unanticipated discoveries during construction activities, it does not provide adequate detail regarding the process that follows. As such, the following mitigation measure is required in order to reduce the potential impacts to archaeological resources to a less than significant level.

Mitigation Measure

The following mitigation measure is required.

CUL-2 Archaeological Resources Assessment, Evaluation, and Treatment

In the event that archaeological resources are unexpectedly encountered during ground-disturbing construction activities, the construction contractor shall halt work within 100 feet of the find, and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service 1983) shall be contacted immediately to evaluate the find, as well as the Sebastopol Planning Department. If the find is determined by the qualified archaeologist to be Native American in origin, then a Native American representative shall also be contacted to participate in the evaluation of the find. If necessary, archaeological testing for CRHR eligibility shall be completed. If the discovery proves to be eligible for the CRHR and impacts to the resource cannot be avoided via project redesign, a qualified archaeologist shall prepare a data recovery plan tailored to the physical nature and characteristics of the deposit, per the requirements of PRC Section 15126.4(b)(3)(C). The data recovery plan shall identify data recovery excavation methods, measurable objectives, and data thresholds to reduce any significant impacts to cultural resources. Pursuant to the data recovery plan, the qualified archaeologist and Native American representative, as appropriate, shall recover and document the scientifically consequential information that justifies the resource's significance. The City shall review and, in consultation with a Native American representative, approve the treatment plan and archaeological testing as appropriate, and the resulting documentation shall be submitted to the regional repository of the California Historical Resources Information System, per PRC Section 15126.4(b)(3)(C).

Significance After Mitigation

By adhering to Action COS 10c and Mitigation Measure CUL-2 above, the City would evaluate and protect significant archaeological resources if encountered during construction, resulting in a less than significant impact.

Threshold 3:	Would the project disturb any human remains, including those interred outside of formal cemeteries?

Impact CUL-3 GRADING AND EXCAVATION REQUIRED FOR THE PROJECT WOULD HAVE THE POTENTIAL TO UNEARTH AND DISTURB PREVIOUSLY UNIDENTIFIED OR UNKNOWN HUMAN REMAINS. COMPLIANCE WITH EXISTING REGULATIONS PERTAINING TO DISCOVERY OF HUMAN REMAINS WOULD ENSURE IMPACTS ARE LESS THAN SIGNIFICANT.

The NWIC records search did not identify any known cemeteries or burial sites within the project site or 0.25-mile radius of the project. However, there is always potential for previously unrecorded or unidentified human remains to exist below ground surface. Construction of the project would require grading and excavation activities, which would have the potential to unearth and disturb previously unidentified human remains, if present. Section 7050.5 of the California Health and Safety Code states:

> "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 overlay adjacent remains, until the County Coroner has examined the remains. If the Coroner determines the remains to be those of a Native American or has reason to believe that they are those of a Native American, the Coroner shall contact by telephone within 24 hours the NAHC. In addition, any person who mutilates or disinters, wantonly disturbs, or willfully removes any human remains in or from any location other than a dedicated cemetery without authority of law is guilty of a misdemeanor."

Thus, in the event that previously unidentified human remains are uncovered within the project site, the County Coroner and NAHC would identify a Native American Most Likely Descendant (MLD) to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods. *CEQA Guidelines* Section 15064.5 directs the lead agency or applicant, under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains and associated grave goods.

Additionally, Action COS 10c of the 2016 Sebastopol General Plan requires all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of human remains:

- If human remains are discovered during any ground disturbing activity, work shall stop until the Planning Department and the County Coroner have been contacted; if the human remains are determined to be of Native American origin, the Native American Heritage Commission (NAHC) and the most likely descendants have been consulted; and work may only resume when appropriate measures have been taken and approved by the Planning Department.

Pursuant to adherence to Action COS 10c and compliance with the existing state requirements, the impact of the proposed project on human remains would be less than significant.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

4.4.3 Cumulative Impacts

The geographic scope for cumulative cultural resource impacts includes the areas surrounding the project site, including incorporated Sebastopol lands and Sonoma County lands within approximately 10 miles of the city. This geographic scope is appropriate for cultural resources because it encompasses the regional area that could contain important resources similar to the project site.

The planned and pending projects in the project vicinity are listed in Table 3-1 of Section 3, Environmental Setting. Cumulative development in the region would continue to disturb areas with the potential to contain historical resources, archaeological resources, and human remains. Impacts to these resources would most likely be mitigated on a project-by-project basis. However, permanent losses of cultural resources would have a potentially significant cumulative impact.

As described under Impact CUL-1, the project would not result in impacts to built environment historical resources as none have been identified in the project site. Because of the lack of built environment historical resources on the project site, the project's contribution to cumulative impacts to historical resources would not be cumulatively considerable. As described above, adherence to General Plan Action COS 10c and Mitigation Measure CUL-2 would ensure that project-level impacts to unknown archaeological resources are adequately mitigated. Therefore, the project's contribution to cumulative impacts to archaeological resources would not be cumulatively considerable. The proposed project and cumulative projects would be required to comply with the State of California Health and Safety Code Section 7050.5 following the discovery of human remains, as described in Impact CUL-3. With adherence to existing regulations relating to human remains, as well as General Plan Action COS 10,c cumulative impacts would be less than significant and the proposed project's impacts would not be cumulatively considerable.

4.5 Geology and Soils

This section describes seismic ground shaking, erosion, geologic stability, and paleontological resource impacts of the proposed project. The analysis that follows relies in part on the Geotechnical Investigation prepared for the project (Quantum Geotechnical, 2021, Appendix F).

4.5.1 Environmental Setting

a. Regional Geology

The City of Sebastopol is in Sonoma County, which is located within the Coastal Range Geomorphic Province, which are northwest trending mountain ranges (2,000 to 4,000, occasionally 6,000 feet elevation above sea level), and valleys. The ranges and valleys trend northwest, subparallel to the San Andreas Fault. To the west is the Pacific Ocean. The coastline is uplifted, terraced and wave-cut. The Coast Ranges are composed of thick Mesozoic and Cenozoic sedimentary strata. The northern and southern ranges are separated by a depression containing the San Francisco Bay. The northern Coast Ranges are dominated by irregular, knobby, landslide topography of the Franciscan Complex. The eastern border is characterized by strike-ridges and valleys in Upper Mesozoic strata. In several areas, Franciscan rocks are overlain by volcanic cones and flows of the Quien Sabe, Sonoma, and Clear Lake volcanic fields. The Coast Ranges are subparallel to the active San Andreas Fault. The San Andreas is more than 600 miles long, extending from Point Arena to the Gulf of California. West of the San Andreas is the Salinian Block, a granitic core extending from the southern extremity of the Coast Ranges to the north of the Farallon Islands. (California Department of Conservation 2002).

b. Local Geologic Setting

Soils

The region is predominantly marine and nonmarine sediments of the Pliocene and Quaternary with recent alluvium. The oldest geologic units in the region are the Franciscan Complex, which is Jurassic (208 to 146 million years ago) (mya) to Early Cretaceous (146 to 106 mya). The Franciscan Complex consists of folded and faulted sandstones, shale, conglomerates, chert, greenstone, and serpentinite rocks. In some areas these rocks occur as large intact blocks, and in others may occur as a mixture of rocks. Much younger Miocene (5 to 23 mya) to Pliocene (1.8 to 5 mya) sedimentary rocks, including the Wilson Grove Formation (marine sandstone, conglomerate, and tuff) and the Petaluma Formation (mostly non-marine claystone, mudstone, and siltstone) were deposited on top of the Franciscan Complex. During Pliocene time volcanic activity created widespread deposits of the Sonoma Volcanics (basalt, andesite, rhyolite, tuff, and other volcanic rocks) in the eastern portion of the County. Pleistocene (1.8 mya to 11,000 years ago) to Holocene (<11,000 years ago) alluvium constitutes the youngest geologic unit in the region (California Department of Water Resources [DWR] 2004).

According to the geologic map of Blake et al. (2005), the site is underlain by sediments of the Wilson Grove Formation of Mio-Pliocene age. This formation consists predominantly of “mostly massive or thick-bedded, buff-weathering, light-grey, fine grained quartz lithic arenite”. It is expected that this bedrock is capped in places by a thin fill of Holocene age alluvium and weathered bedrock. These soils would be expected to consist of silty clays to sandy silts (Appendix F).

Seismic Hazards

Like much of California, the City of Sebastopol is subject to risks associated with potentially destructive earthquakes. Earthquakes are most common along geologic faults, which are planes of weakness or fractures along which rocks have been displaced. The project site is near active faults, such as the San Andreas Fault, Rogers Creek Fault, Healdsburg Fault, Mayacama Fault, and West Napa Fault (California Department of Conservation [DOC] 2021). Regional hazards with respect to earthquakes are considered significant due to the City's proximity to major faults in the area (e.g., San Andreas and Hayward) and the project site's proximity to minor faults listed above.

The probability of one or more earthquakes of magnitude 6.7 (Richter scale) or higher occurring in the San Francisco Bay Area has been evaluated by the U.S. Geological Survey (USGS). Based on the results of the USGS evaluation, there is a 63-percent likelihood that such an earthquake event will occur in the Bay Area between 2007 and 2036. The faults with the greater probability of movement with a magnitude of 6.7 or higher earthquake are the Hayward Fault at 27 percent, the San Andreas Fault at 21 percent, and the Calaveras Fault at 11 percent (USGS 2007).

Surface Rupture

Surface rupture represents the breakage of ground along the surface trace of a fault, which is caused by the intersection of the fault surface area ruptured in an earthquake with the earth's surface. Fault displacement occurs when material on one side of a fault moves relative to the material on the other side of the fault. This can have particularly adverse consequences when buildings are located within the rupture zone. It is not feasible from a structural or economic perspective to design and build structures that can accommodate rapid displacement involved with surface rupture. Amounts of surface displacement can range from a few inches to tens of feet during a rupture event.

Faults are geologic hazards because of surface fault displacement and seismic ground shaking, which are distinct but related properties. Surface fault displacement results when the fault plane ruptures and that rupture surface extends to or intersects the ground surface. Surface fault rupture can be very destructive to structures constructed across active faults. However, the zone of damage is limited to a relatively narrow area along either side of the fault as opposed to seismic ground shaking damage that can be widespread. Faults are categorized as active, potentially active, and inactive. A fault is classified as active if it has moved during the Holocene time, which consists of approximately the last 11,000 years. A fault is classified as potentially active if it has experienced movement within Quaternary time, which is during the last 1.8 million years. Faults that have not moved in the last 1.8 million years are generally considered inactive.

The closest faults are described above under the *Faults* subheading. There are no Holocene faults or Alquist-Priolo Fault Zones in or near the project site.

Faults

San Andreas Fault System

The San Andreas Fault system is an active fault located approximately 11 miles west of the City of Sebastopol. The fault generally follows a northwest to southeast line and is capable of 8.0 magnitude earthquakes. The fault is characterized as a right-lateral strike-slip fault. Major seismic events along this fault were recorded on April 18, 1906 (in the Northern segment) and on January 9, 1857 (in the Mojave segment). The most recent seismic event along this fault was the 1989 Loma

Prieta earthquake, which occurred on October 18, 1989. The epicenter was on the San Andreas Fault roughly 56 miles south of San Francisco and 10 miles northeast of Santa Cruz, near Mt. Loma Prieta in the Santa Cruz Mountains. The focal depth was 11 miles (typical California earthquake focal depths are 4 to 6 miles). Loma Prieta ruptured the southernmost 30 miles of the break that caused the 1906 San Francisco Earthquake. The Loma Prieta earthquake registered at a magnitude 6.9 and was felt as far away as San Diego and Western Nevada (California Geological Survey 2002).

Rogers Creek Fault

The Rodgers Creek Fault is an active fault located approximately 6 miles to the east of the City of Sebastopol. The fault generally follows a path that is parallel to the San Andreas Fault and is capable of a 7.0 magnitude earthquake. This fault is considered a northern extension of the Hayward Fault System, although there is no evidence that they connect under the San Pablo Bay. The fault is characterized as a right-lateral strike slip fault. There are no historical reports of land rupture; however, geologists estimate the most recent rupture to have occurred sometime between 1670 and 1776 (California Geological Survey 2002).

Healdsburg Fault

The Healdsburg Fault is an active fault located approximately 6 miles east of the City of Sebastopol. The Healdsburg Fault extends north from the Rodgers creek fault in Santa Rosa, and generally follows a path that is parallel to the San Andreas Fault and is capable of a 7.5 magnitude earthquake. This fault is a northern extension of the Rodgers Creek Fault, which is part of the Hayward Fault System. The fault is characterized as a right-lateral strike slip fault. The last reported event was recorded in 1969 (California Geological Survey 2002).

Mayacama Fault

The Mayacama Fault is an active fault located to the northwest of the City of Sebastopol. The fault generally follows a path that is parallel to the San Andreas Fault and is capable of a 7.5 magnitude earthquake. This fault is the northern-most extension of Hayward Fault System. The fault is characterized as a right-lateral slip fault. There are no historical reports of land rupture; however, geologists estimate the most recent rupture to have occurred sometime between 1520 and 1660. (California Geological Survey 2002).

West Napa Fault

The West Napa fault is located approximately 25 miles east of the City of Sebastopol. The fault is associated with an approximately 57-km-long zone of late Quaternary deformation that trends along the western margin of the Napa Valley from near the City of St. Helena on the north to Carquinez Strait on the south. The fault has an overall better geomorphic expression than previously thought, and additional evidence of young fault activity has been observed through recent studies. Geologists from UC Davis now warn that the West Napa Fault, which in 2014 triggered the Bay Area's strongest earthquake in the past 25 years (6.0 magnitude), is longer and quicker moving than previously thought.

Ground Shaking

The major cause of structural damage from earthquakes is ground shaking. The intensity of ground motion expected at a particular site depends upon the magnitude of the earthquake, the distance to the epicenter, and the geology of the area between the epicenter and the property. Greater movement can be expected at sites located on poorly consolidated material such as alluvium, within close proximity to the ruptured fault, or in response to a seismic event of great magnitude. Historically, the City of Sebastopol has been impacted by ground shaking during major earthquakes in the seismically active Northern California region and is likely to experience ground shaking from major earthquakes in the future.

Liquefaction

Liquefaction is a seismic phenomenon in which loose, saturated granular and non-plastic fine-grained soils lose their structure/strength when subjected to high-intensity ground shaking. Liquefaction occurs when three general conditions exist: 1) shallow groundwater within the top 50 feet of the ground surface; 2) low-density non-plastic soils; and 3) high-intensity ground motion. The risk of liquefaction within the City is generally very low, with areas of low risk along South Main Street and moderate to high risk in the northeastern portion of the City. Liquefaction risk at the project site is characterized as very low (Appendix F).

Landslides and Slope Stability

Seismic ground shaking can also result in landslides and other slope instability issues. Landslides occur when slopes become unstable, and masses of earth material move downslope. Landslides are usually rapid events, often triggered during periods of rainfall or by earthquakes. Mudslides and slumps are a shallower type of slope failure. They typically affect the upper surficial soils horizons rather than bedrock features. Usually, mudslides and slumps occur during or soon after periods of rainfall, but they can be triggered by seismic shaking. The area's most susceptible to landslides are shown on maps prepared by the California Division of Mines and Geology. Landslide susceptibility is grouped into classes ranging from zero to ten, which are calculated based upon a combination of rock strength and slope. Classes seven through ten indicate very high landslide susceptibility and include both very steep slopes in hard rocks and moderate to very steep slopes in weak rocks (CGS 2011). In addition, landslides occur where faults have fractured rock and along the base of slopes or cliffs where supporting material has been removed by stream or wave erosion, or human activities. Heavy rainfall, human actions, or earthquakes can trigger landslides. They may take the form of a slow continuous movement such as a slump or may move very rapidly as a semi-liquid mass such as a debris flow or avalanche. Landslide susceptibility within the City of Sebastopol ranges from very low to moderate. The project site has moderate susceptibility to landslides.

Subsidence

Subsidence or settlement can occur from immediate settlement, consolidation, shrinkage of expansive soil, and liquefaction. Immediate settlement occurs when a load from a structure or placement of new fill material is applied, causing distortion in the underlying materials. This settlement occurs quickly and is typically complete after placement of the final load. Consolidation settlement occurs in saturated clay from the volume change caused by squeezing out water from the pore spaces. Consolidation occurs over a period and is followed by secondary compression, which is a continued change in void ratio (ratio of the volume of voids to volume of solids) under the continued application of the load. Soils tend to settle at different rates and by varying amounts depending on the load weight or changes in properties over an area, which is referred to as differential settlement. Areas underlain by soft sediments or undocumented fills are most prone to settlement. While subsidence is an issue of concern in some areas in California, the Natural Resource Conservation Service does not identify it as an issue of concern in the City of Sebastopol.

Expansive Soils

Expansive soils swell with increases in moisture content and shrink with decreases in moisture content. These soils usually contain high clay content. Foundations for structures constructed on expansive soils require special design considerations. Because expansive soils can expand when wet and shrink when dry, they can cause foundations, basement walls, and floors to crack, causing substantial structural damage. As such, structural failure due to expansive soils near the ground surface is a potential hazard. Shrink-swell potential throughout the City is low. Only one area in the city has high potential for shrink-swell located in the northeastern corner of the city. The project site contains low to moderately expansive clay soil (Appendix F).

Soil Erosion

Erosion refers to the removal of soil by water or wind. Factors that influence erosion include the amount of rainfall and wind, the length and steepness of the slope, and the amount and type of vegetative cover. Depending on how well protected the soil is from these forces, the erosion process can be very slow or rapid. Properties of the soil also contribute to how likely or unlikely it is to erode. Removal of natural or man-made protection can result in substantial soil erosion and excessive sedimentation and pollution problems in streams, lakes, and estuaries through a process called siltation. Risk of soil erosion throughout the City is relatively low, with higher rates of erosion present along the eastern edge of the City. Risk of soil erosion at the project site is moderate and may be impacted by grading activities (Appendix F).

Paleontological Resources

Paleontological resources, or fossils, are the evidence of once-living organisms preserved in the rock record. They include both the fossilized remains of ancient plants and animals and the traces thereof (e.g., trackways, imprints, burrows, etc.). Paleontological resources are not found in "soil" but are contained within the geologic deposits or bedrock that underlies the soil layer. Typically, fossils are greater than 5,000 years old (i.e., older than middle Holocene in age) and are usually preserved in sedimentary rocks. Although rare, fossils can also be preserved in volcanic rocks and low-grade metamorphic rocks under certain conditions (Society of Vertebrate Paleontology [SVP] 2010). Fossils occur in a non-continuous and often unpredictable distribution within some sedimentary units, and the potential for fossils to occur within sedimentary units depends on several factors. It is possible to evaluate the potential for geologic units to contain scientifically important paleontological resources.

The geology of the region surrounding the project site was mapped by Delattre and Koehler (2008), who identified a single geologic unit, Wilson Grove Formation, underlying the project site. The Wilson Grove Formation consists of light gray to yellowish-brown, well-sorted, sandstone and pebbly sandstone with orange and red iron-oxide staining and locally occurring lenses of well-rounded chert and quartz pebbles. The Wilson Grove Formation is late Miocene to Pliocene in age. The Wilson Grove Formation has produced numerous paleontological resources, including walrus (Odobenidae), sea cow (Sirenia), whale (Cetacea), bird, shark, ray-finned fish, and invertebrates (Powell et al. 2019; University of California Museum of Paleontology 2023). Given this fossil-producing history, the Wilson Grove Formation has high paleontological sensitivity.

4.5.2 Regulatory Setting

a. Federal Regulations

U.S. Geological Survey Landslide Hazard Program

The USGS created the Landslide Hazard Program in the mid-1970s; the primary objective of the program is to reduce long-term losses from landslide hazards by improving our understanding of the causes of ground failure and suggesting mitigation strategies. The federal government takes the lead role in funding and conducting this research, whereas the reduction of losses due to geologic hazards is primarily a State and local responsibility. In Sonoma County, an Emergency Operations Plan has been developed for the protection of life and property.

Clean Water Act

Congress enacted the Clean Water Act (CWA), formerly the Federal Water Pollution Control Act of 1972, with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and non-point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). NPDES permitting authority is administered by the California State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCB). The City of Sebastopol is located within the North Coast RWQCB jurisdiction.

Projects within the city and Sonoma County that disturb more than one acre are required to obtain NPDES coverage under the California General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit). The Construction General Permit (Order 2022-0057-DWQ) requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) describing best management practices (BMPs) that the discharger would use to prevent and retain storm water runoff and to prevent soil erosion.

Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act)

The Stafford Act (1988) provides the legal basis for state, tribal, and local governments to undertake risk-based approaches to reducing natural hazard risks through mitigation planning. Specifically, the Stafford Act requires state, tribal, and local governments to develop and adopt Federal Emergency Management Agency (FEMA)-approved hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance. The Act also authorizes grants for pre- and post-disaster projects and planning.

Disaster Mitigation Act of 2000

Congress passed the Disaster Mitigation Act of 2000 to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act by invoking new and revitalized approaches to mitigation planning. Section 322 of the Act emphasized the need for state and local government entities to closely coordinate on mitigation planning activities and makes the development of a hazard mitigation plan a specific eligibility requirement for local governments applying for federal mitigation grant funds. Communities with an adopted and federally approved hazard mitigation plan thereby become prepositioned and more apt to receive available mitigation funds before and after the next declared disaster.

To implement the new Stafford Act provisions, FEMA published requirements and procedures for local hazard mitigation plans in the Code of Federal Regulations (CFR) at Title 44, Chapter 1, Part 201.6. These regulations specify minimum standards for developing, updating, and submitting local hazard mitigation plans for agency review and approval at least once every five years.

b. State Regulations

California Building Code

The California Building Code (CBC), Title 24, Part 2 provides building codes and standards for the design and construction of structures in California. The 2016 CBC is based on the 2015 International Building Code, with the addition of more extensive structural seismic provisions. Chapter 16 of the CBC contains definitions of seismic sources and the procedure used to calculate seismic forces on structures. The CBC requires addressing soil-related hazards, such as treating hazardous soil conditions involving removal, proper fill selection, and compaction. In cases where soil remediation is not feasible, the CBC requires structural reinforcement of foundations to resist the forces of expansive soils. The CBC includes requirements for geotechnical investigations (such as inclusion of a soil report), excavation, grading, and fills, load-bearing of soils, as well as foundations, shallow foundations, and deep foundations (Chapter 18). Chapter 18 also describes analysis of expansive soils, including conducting soil tests in areas likely to contain expansive soils. Soils are considered expansive if either items one through three are met or item four is met:

1. Plasticity index (PI) of 15 or greater, determined in accordance with ASTM D 4318;
2. More than 10 percent of the soil particles pass a No. 200 sieve (75 micrometers), determined in accordance with ASTM D 422;
3. More than 10 percent of the soil particles are less than 5 micrometers in size, determined in accordance with ASTM D 422; and
4. Expansion index greater than 20, determined in accordance with ASTM D 4829.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 was passed into law following the destructive February 9, 1971 magnitude 6.6 San Fernando earthquake. The Act provides a mechanism for reducing losses from surface fault rupture on a statewide basis. The intent of the Act is to ensure public safety by prohibiting the siting of most structures for human occupancy across traces of active faults that constitute a potential hazard to structures from surface faulting or fault creep. This Act groups faults into categories of active, potentially active, and inactive. Historic and Holocene age faults are considered active, Late Quaternary and Quaternary age faults are considered potentially active, and pre-Quaternary age faults are considered inactive.

The Alquist-Priolo Earthquake Fault Zoning Act regulates development near the surface traces of active faults to mitigate the hazard of surface fault rupture. Essentially, this Act contains two requirements: (1) it prohibits the location of most structures for human occupancy across the trace of active faults; and (2) it establishes Earthquake Fault Zones and requires geologic/seismic studies of most proposed development within 50 feet of the zone. The Earthquake Fault Zones are delineated and defined by the State Geologist and identify areas where potential surface rupture along a fault could occur. According to CGS, there are no Earthquake Fault Zones in the vicinity of the project site (DOC 2021).

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act (the Act) of 1990 was passed into law following the destructive October 17, 1989, magnitude 6.9 Loma Prieta earthquake. The Act directs the CGS to delineate Seismic Hazard Zones. The purpose of the Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards, such as liquefaction, landslides, amplified ground shaking, and inundation by tsunami or seiche. Cities, counties, and State agencies are directed to use seismic hazard zone maps developed by CGS in their land-use planning and permitting processes. The Act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones. CGS maintains these required maps. The project site is not in a CGS-mapped seismic hazard zone.

California Environmental Quality Act – Paleontological Resources

Paleontological resources are protected under CEQA, which states in part a project will "normally" have a significant effect on the environment if it, among other things, will disrupt or adversely affect a paleontological site except as part of a scientific study. Specifically, in Section VII(f) of Appendix G of the CEQA Guidelines, the Environmental Checklist Form, the question is posed thus: "Will the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature." To determine the uniqueness of a given paleontological resource, it must first be identified or recovered (i.e., salvaged). Therefore, CEQA mandates mitigation of adverse impacts, to the extent practicable, to paleontological resources.

CEQA does not define "a unique paleontological resource or site." However, the Society of Vertebrate Paleontology (SVP) has defined a "significant paleontological resource" in the context of environmental review as follows:

> 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 typically to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years) (SVP 2010).

The loss of paleontological resources meeting the criteria outlined above (i.e., a significant paleontological resource) would be a significant impact under CEQA, and the CEQA lead agency is responsible for ensuring that impacts to paleontological resources are mitigated, where practicable, in compliance with CEQA and other applicable statutes.

California Public Resources Code

Section 5097.5 of the Public Resources Code states:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express

permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

Here "public lands" means those owned by, or under the jurisdiction of, the state or a city, county, district, authority, or public corporation, or an agency thereof. Consequently, public agencies are required to comply with Public Resources Code Section 5097.5 for their own activities, including construction and maintenance, and for permit actions (e.g., encroachment permits) undertaken by others.

c. Regional and Local Regulations

Sonoma County Multi-Jurisdictional Hazard Mitigation Plan

The Sonoma County Multi-Jurisdictional Hazard Mitigation Plan (2021) assesses hazard vulnerabilities and identifies potential mitigation actions each jurisdiction will pursue in order to reduce the level of injury, property damage, and community disruption that might otherwise result from such events. Adoption of the MJHMP will allow the County and participating jurisdictions to remain eligible for various types of pre- and post-disaster financial assistance from the Federal Emergency Management Agency (FEMA) and the State government.

2016 Sebastopol General Plan

The City of Sebastopol General Plan (2016) sets forth the following guiding and implementing policies relevant to geology, soils, and seismicity:

Policy SA 1-1: Reduce the risk of loss of life, personal injury, and damage to property and the environment resulting from seismic hazards.

Policy SA 1-2: Enforce adopted regulations to identify and address potential hazards relating to seismic, geologic, and soils conditions.

Policy SA 1-3: Discourage construction of high density residential and other critical, high occupancy or essential services buildings in areas with high seismic and/or geologic hazards, including high potential for shrink-swell, liquefaction, and landslides.

Policy SA 1-4: Regulate development in areas of seismic and geologic hazards to reduce risks to life and property associated with earthquakes, liquefaction, erosion, landslides, and expansive soils.

Policy SA 1-5: Where feasible, require new development to avoid unreasonable exposure to geologic hazards, including earthquake damage, subsidence, liquefaction, and expansive soils.

Policy SA 1-6: Ensure that critical facilities are designed and constructed to withstand the "maximum probable" earthquake and remain in service.

Policy SA 1-7: All structures and building foundations located within areas containing expansive soils shall be designed and engineered to comply with the most current version of the California Code of Regulations (CCR), Title 24.

Policy SA 1-8: Encourage community awareness of seismic safety issues, including building safety and emergency response plans, including steps to take for safety during and after an earthquake and identified evacuation routes.

> **Policy CSF 4-8:** Prioritize sewer service improvements to areas within the City that pose a threat to public health and the environment as a result of deficiencies in existing sewer or septic systems.
>
> **Policy CSF 4-9:** Ensure future sewer and septic systems are designed to meet or exceed all applicable water quality standards and are located to protect waterways and groundwater resources.

Goal COS 10 of the City of Sebastopol General Plan (2016) is to "Protect and Preserve Sebastopol's Historic and Cultural Resources", which includes paleontological resources.

Action COS 10c states:

> Require all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources or human remains:
>
> If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Planning Department shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Planning Department.

Sebastopol Municipal Code (SMC)

SMC Chapter 16.40 – General Requirements

SMC Section 16.40.120(F) explains the measures required to protect paleontological resources in Sebastopol. It states "Whenever significant archeological or paleontological sites may be located within the project area, an appropriate survey by qualified archaeologists shall be made and mitigation measures implemented prior to development of the site. Changes to the project to prevent or minimize the impact and/or mitigation measures shall be required where development may result in impacts to such areas."

SMC Section 16.40.200 outlines all of the required parts of a geotechnical report or soils investigation, as required by SMC Section 16.28.020. As a part of a geotechnical report, the City required that recommendations for grading procedures and design criteria for erosion control and corrective measures shall be included. This section also requires that a Geotechnical Engineer shall review and approve the final drawings for grading and other geotechnical work for the subdivision as compliance with the recommendations of his or her report. In addition, SMC Chapter 16.40 requires that the design and improvement of each subdivision shall incorporate all required mitigation measures, conditions and requirements identified in the environmental document adopted for the project in any plan prepared for the subdivision.

SMC Chapter 13.08 – Regulations for Sewer Service

SMC Section 13.08.040 (C) of Chapter 13.08 requires that any new development is required to connect to public sewer. This requirement also pertains to the construction of an additional unit on the existing parcel.

4.5.3 Impact Analysis

a. Significance Thresholds and Methodology

Significance Thresholds

Based on Appendix G of the *CEQA Guidelines* a project may be deemed to have a significant impact on geology and soils if it would:

1. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
   a. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault
   b. Strong seismic ground shaking
   c. Seismic-related ground failure, including liquefaction
   d. Landslides;
2. Result in substantial soil erosion or the loss of topsoil;
3. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;
4. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirectly risks to life or property;
5. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; or
6. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Methodology

Impacts to geology and soils were determined by reviewing the existing setting for the project site, as summarized in Section 4.5.1, *Setting*, and analyzing the project's potential to result in substantial adverse effects related to geological hazards.

The paleontological sensitivity of the geologic units that underlie the project site were evaluated to assess the project's potential for significant impacts to scientifically important paleontological resources. Paleontological sensitivity refers to the potential for a geologic unit to produce scientifically significant fossils. Direct impacts to paleontological resources occur when earthwork activities, such as grading or trenching, cut into the geologic deposits within which fossils are buried and physically destroy the fossils. Sensitivity is determined by rock type, history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey.

The SVP outlines in its Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources guidelines for categorizing paleontological sensitivity of geologic units within a project site (SVP 2010). The paleontological sensitivity of geologic units underlying the project site has been evaluated according to the following categories:

- **High Potential:** Rock units from which significant vertebrate or significant invertebrate fossils or significant suites of plant fossils have been recovered are considered to have a high potential for containing significant non-renewable fossiliferous resources. These units include but are not limited to, sedimentary formations and some volcanic formations which contain significant nonrenewable paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils.
- **Low Potential:** Sedimentary rock units that are potentially fossiliferous but have not yielded fossils in the past or contain common and/or widespread invertebrate fossils of well documented and understood taphonomic (processes affecting an organism following death, burial, and removal from the ground), phylogenetic species (evolutionary relationships among organisms), and habitat ecology.
- **Undetermined Potential:** Specific areas underlain by sedimentary rock units for which little information is available are considered to have undetermined fossiliferous potentials. Field surveys by a qualified vertebrate paleontologist to specifically determine the potentials of the rock units are required before programs of impact mitigation for such areas may be developed.
- **No Potential:** Rock units of metamorphic or igneous origin are commonly classified as having no potential for containing significant paleontological resources.

b. Project Impacts and Mitigation Measures

Threshold 1a:	Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

Impact GEO-1 **THE PROPOSED PROJECT WOULD NOT DIRECTLY OR INDIRECTLY CAUSE POTENTIAL SUBSTANTIAL ADVERSE EFFECTS, INCLUDING RISK OF LOSS, INJURY, OR DEATH INVOLVING RUPTURE OF A KNOWN EARTHQUAKE FAULT. IMPACTS WOULD BE LESS THAN SIGNIFICANT.**

Fault rupture can occur along or immediately adjacent to faults during an earthquake. Fault rupture is characterized by ground cracks and displacement which could endanger life and property. Damage is typically limited to areas close to the moving fault.

There are no active or inactive faults that cross the project site; the site is not located within an Earthquake Fault Zone designated by the state under the Alquist-Priolo Earthquake Fault Zoning Act (DOC 2023). As such, the proposed project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault. This impact would be less than significant.

Mitigation Measures

No mitigation would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 1b:	Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

Impact GEO-2 THE PROPOSED PROJECT WOULD NOT DIRECTLY OR INDIRECTLY CAUSE POTENTIAL SUBSTANTIAL ADVERSE EFFECTS INCLUDING THE RISK OF LOSS, INJURY, OR DEATH INVOLVING STRONG SEISMIC GROUND SHAKING. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Ground shaking effects are also the result of an earthquake, but the impacts can be widespread. Although a function of earthquake intensity, ground shaking effects can be magnified by the underlying soils and geology, which may amplify shaking at great distances. It is difficult to predict the magnitude of ground shaking following an earthquake, as shaking can vary widely within a relatively small area. The project site is in a seismically active area. There are numerous faults located in the region. These include the San Andreas Fault System, the Rodgers Creek Fault, the Healdsburg Fault, West Napa Fault, and the Mayacama Fault. Rupture of any of these faults, or of an unknown fault in the region could cause seismic ground shaking. As a result, development at the project site may expose people or structures to potential adverse effects associated with a seismic event, including strong ground shaking and seismic-related ground failure.

Potential structural damage and the exposure of people to the risk of injury or death from structural failure could occur. However, these risks would be minimized by compliance with CBC engineering design and construction measures, which require foundations and other structural support features to resist or absorb damaging forces from strong ground shaking. Although nothing can ensure that the residences and infrastructure do not fail under seismic stress, proper engineering can minimize the risk to life and property. Although the risk of sustaining an earthquake with higher ground accelerations can never be completely eliminated, compliance with all applicable provisions of the CBC would ensure that potential impacts from ground-shaking would be minimized to the extent possible. Additionally, SMC Chapter 16.40 requires that all recommendations included in the Geotechnical Investigation (Appendix F) be incorporated into the design of the project and each of the proposed residences, which would be verified by the City prior to issuance of a building permit. Incorporation of the design features related to liquefaction and soil stability recommended in the Geotechnical Investigation, such as moisture conditioning and compacting soils, utilization of a post-tensioned slab foundation, and grading during dry months, would ensure that impacts would be less than significant.

Mitigation Measures

No mitigation would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 1c:	Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?
Threshold 1d:	Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?
Threshold 3:	Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Impact GEO-3 THE PROJECT COULD CAUSE SUBSTANTIAL ADVERSE EFFECTS INCLUDING THE RISK OF LOSS, INJURY, OR DEATH INVOLVING SEISMIC- RELATED GROUND FAILURE INCLUDING LIQUEFACTION, LANDSLIDES, LATERAL SPREADING, SUBSIDENCE, OR COLLAPSE. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Liquefaction most often occurs in loose saturated silts, and saturated poorly graded fine-grained sands. The California Geological Survey (CGS) has not yet published a map categorizing liquefaction or landslide hazards in the vicinity. The Association of Bay Area Governments (ABAG) liquefaction susceptibility map categorizes the site in an area with low susceptibility (Appendix F). Due to the presence of a thick predominantly non-liquefiable cover overlying any potential liquefiable sand layers, no sand boils are expected and will limit any surface manifestations of liquefaction (Appendix F).

The proposed project would involve grading and excavation that would level portions of the project site. As stated above, the CGS has not yet published a map categorizing landslide hazards in the vicinity of the project site. In order to address the hazards present at the project site, the geotechnical report prepared by Quantum Geotechnical, Inc. (Appendix F) provides a comprehensive list of design recommendations. Those recommendations cover several design considerations, including foundation design, site preparation and grading, utility trenches, and drainage, which would minimize the potential for landslides to occur on site as a result of development. SMC Chapter 16.40 requires that all recommendations included in the Geotechnical Investigation (Appendix F) be incorporated into the design of the project and each of the proposed residences, which would be verified by the City prior to issuance of a building permit. Incorporation of the design features related to liquefaction and soil stability recommended in the Geotechnical Investigation would ensure that impacts would be less than significant.

Mitigation Measures

No mitigation would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 2:	Would the project result in substantial soil erosion or the loss of topsoil?

Impact GEO-4 **THE PROPOSED PROJECT WOULD NOT RESULT IN SUBSTANTIAL SOIL EROSION OR LOSS OF TOPSOIL. IMPACTS WOULD BE LESS THAN SIGNIFICANT.**

Construction of the proposed project would require grading and excavation on the project site. Grading and excavation activities would temporarily expose bare soils, which could be removed from the site and transported through wind shearing or stormwater runoff. Because the project site is greater than one acre, construction activities would be subject to the National Pollutant Discharge Elimination System Construction General Permit and would be required to develop a SWPPP, as discussed under Section 4.5.3, *Regulatory Setting.* The SWPPP includes BMPs to reduce soil erosion and sedimentation. BMPs include but are not limited to the development of inspection and maintenance procedures for stormwater control, containment of leaks and spills of pollutants in storage areas on-site, prevention of sediment flow into storm drains, and watering of exposed soil to reduce erosion.

With mandatory implementation of the SWPPP and erosion control measures, the proposed project would not result in substantial soil erosion or the loss of topsoil. Impacts would be less than significant.

Mitigation Measures

No mitigation would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 4:	Would the project be located on expansive soil, as defined in Table 1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Impact GEO-5 **PORTIONS OF THE PROJECT SITE HAVE THE POTENTIAL TO BE LOCATED ON EXPANSIVE SOIL, AS DEFINED IN TABLE 1-B OF THE UNIFORM BUILDING CODE, WHICH MAY RESULT IN DIRECT OR INDIRECT RISKS TO LIFE OR PROPERTY. IMPACTS WOULD BE LESS THAN SIGNIFICANT.**

Expansive soils tend to swell with increases in soil moisture and shrink as the soil moisture decreases. For example, expansive soils could swell during and hours after a precipitation event but then shrink in the following weeks if no additional precipitation occurs. Shrinking and swelling of soils can cause damage to the foundations of proposed residences, roads, and other structures. The project site contains the presence of moderately expansive clay soil that may affect the foundation subgrade (Appendix F). Near surface materials vary from low to moderately expansive, which makes the on-site soil material prone to heave and shrink movements with changes in moisture content (Appendix F).

Compliance with the CBC would reduce the risk to life and property involving expansive soil. As described under Impact GEO-2, the project would incorporate seismic and soil stability measures included in the Geotechnical Investigation (Appendix E) pursuant to Sebastopol Municipal Code and the CBC. Incorporation of these recommendations would ensure that impacts related to expansive soils would be less than significant.

Mitigation Measures

No mitigation would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 5:	Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

Impact GEO-6 THE PROJECT WOULD NOT INVOLVE SEPTIC TANKS OR ALTERNATIVE WASTEWATER DISPOSAL SYSTEMS. THERE WOULD BE NO IMPACT.

In accordance with SMC Section 13.08.040 (C), which requires all new development to connect to the public sewer system, the project would be connected to the municipal wastewater treatment system. Septic systems would not be used. No impact would occur.

Mitigation Measures

No mitigation would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 6:	Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Impact GEO-7 THE PROJECT HAS THE POTENTIAL TO SIGNIFICANTLY IMPACT PALEONTOLOGICAL RESOURCES. THESE IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION.

The project site is underlain by a single geologic unit, the Wilson Grove Formation (Delattre and Koehler 2008), which has high paleontological sensitivity. Significant impacts to paleontological resources include the destruction, damage, or loss of scientifically important paleontological resources or associated stratigraphic data. Ground-disturbing activities (i.e., grading, excavating, trenching) in undisturbed sediments or geologic units with high paleontological sensitivity have the potential to significantly impact paleontological resources. The project would be constructed on land that was previously used for orchards and a small garden. The geotechnical investigation did not encounter any obvious fill sediments within the project site (Appendix F), so the site is assumed to be undisturbed. Ground-disturbing activities for this project would include grading for building pads and excavations for new utilities (i.e., water, sewer, storm drains). Grading for building pads will extend down to 6 feet below the surface, and excavations for utilities will extend down to 13 feet below the surface. Therefore, previously undisturbed portions of the highly sensitive Wilson Grove Formation will be disturbed and significant impacts to paleontological resources could occur.

Mitigation Measure GEO-7 is recommended to ensure that potential impacts to paleontological resources are less than significant. This mitigation measure would apply during all ground-disturbing activities in undisturbed sediments.

Mitigation Measures

GEO-7 Paleontological Resources Monitoring and Mitigation

QUALIFIED PROFESSIONAL PALEONTOLOGIST.

Prior to excavation, City Ventures shall retain a Qualified Professional Paleontologist, as defined by the Society of Vertebrate Paleontology (SVP; 2010). The Qualified Professional Paleontologist shall draft a Paleontological Resources Mitigation and Monitoring Plan, which shall direct all mitigation measures related to paleontological resources.

PALEONTOLOGICAL WORKER ENVIRONMENTAL AWARENESS PROGRAM.

Prior to the start of construction, the Qualified Professional Paleontologist or their designee shall conduct a paleontological Worker Environmental Awareness Program (WEAP) training for construction personnel regarding the appearance of fossils and the procedures for notifying paleontological staff should fossils be discovered by construction personnel.

PALEONTOLOGICAL MONITORING.

Full-time paleontological monitoring shall be conducted during ground disturbing construction activities within previously undisturbed sediments. Paleontological monitoring shall be conducted by a paleontological monitor with experience with collection and salvage of paleontological resources and who meets the minimum standards of the SVP (2010) for a Paleontological Resources Monitor. The Qualified Professional Paleontologist may recommend that monitoring be reduced in frequency or ceased entirely based on geologic observations. Such decisions shall be subject to review and approval by the City of Sebastopol. In the event of a fossil discovery by the paleontological monitor or construction personnel, all construction activity within 50 feet of the find shall cease, and the Qualified Professional Paleontologist shall evaluate the find. If the fossil(s) is (are) not scientifically significant, then construction activity may resume. If it is determined that the fossil(s) is (are) scientifically significant, the following shall be completed:

- **Fossil Salvage.** The paleontological monitor shall salvage (i.e., excavate and recover) the fossil to protect it from damage/destruction. Typically, fossils can be safely salvaged quickly by a single paleontological monitor with minimal disruption to construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. Bulk matrix sampling may be necessary to recover small invertebrates or microvertebrates from within paleontologically sensitive deposits. After the fossil(s) is (are) salvaged, construction activity may resume.
- **Fossil Preparation and Curation**. Fossils shall be identified to the lowest (i.e., most-specific) possible taxonomic level, prepared to a curation-ready condition, and curated in a scientific institution with a permanent paleontological collection along with all pertinent field notes, photos, data, and maps. Fossils of undetermined significance at the time of collection may also warrant curation at the discretion of the Qualified Professional Paleontologist.

FINAL PALEONTOLOGICAL MITIGATION REPORT.

Upon completion of ground-disturbing activities (or laboratory preparation and curation of fossils, if necessary), the Qualified Professional Paleontologist shall prepare a final report describing the results of the paleontological monitoring efforts. The report shall include a summary of the field and laboratory methods employed; an overview of project geology; and, if fossils were discovered, an analysis of the fossils, including physical description, taxonomic identification, and scientific significance. The report shall be submitted to the City of Sebastopol and, if fossil curation occurred, the designated scientific institution.

Significance After Mitigation

Implementation of Mitigation Measure GEO-1 would reduce potential impacts to paleontological resources to a less than significant level through the recovery, identification, and curation of previously unrecovered fossils.

4.5.4 Cumulative Impacts

The geographic scope for considering cumulative impacts to geology and soils is the project site and the immediately adjacent sites. This scope is appropriate because geological materials and soils occur at specific locales and are generally affected by construction and operational activities directly on or immediately adjacent to the soils, and not by construction or operational activities occurring outside the area. In addition, any geologic impacts of the project would be site-specific.

Cumulative development in the area would increase the population of the region, as well as the number of structures and supporting infrastructure in the region. Cumulative development could expose new residents and property to seismic and other geologic hazards. However, as with the proposed project, cumulative development would be required to evaluate seismic and soil issues through preparation of individual soils and geotechnical engineering studies specific to each project. Cumulative development would also be required to adhere to existing local and State laws and regulations including, among others, applicable CBC standards and requirements. Therefore, cumulative impacts related to seismic and soil issues would be less than significant.

The proposed project, by itself or in connection with other planned development in the surrounding area, would not exacerbate existing seismic risks or soil issues and would therefore not result in a cumulatively considerable contribution to cumulative impacts. With the implementation of the identified mitigation for the project as well as its adherence to the applicable laws and regulations, the project's contribution to any cumulative geology and soils, including paleontological resources, would not be considerable.

4.6 Greenhouse Gas Emissions

This section summarizes the setting for greenhouse gas (GHG) emissions and climate change and analyzes the impacts related to GHG emissions and climate change due to the project.

4.6.1 Setting

Gases that absorb and re-emit infrared radiation in the atmosphere are called GHGs. The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2); methane (CH_4); nitrous oxides (N_2O); fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs); and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

Different types of GHGs have varying global warming potentials (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emitted, referred to as "carbon dioxide equivalent" (CO_2e), which is the amount of GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane has a 100-year GWP of 30, meaning its global warming effect is 30 times greater than CO_2 on a molecule per molecule basis (United Nations Intergovernmental Panel on Climate Change [IPCC] 2021).[1]

GHGs are emitted by natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are usually by-products of fossil fuel combustion, and CH_4 results from off-gassing associated with agricultural practices and landfills. Human-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and SF_6 (United States Environmental Protection Agency [USEPA] 2023a).

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period. The term "climate change" is often used interchangeably with the term "global warming," but climate change is preferred because it conveys that other changes are happening in addition to rising temperatures. The baseline against which these changes are measured originates in historical records that identify temperature changes that occurred in the past, such as during previous ice ages. The global climate is changing continuously, as evidenced in the geologic record, which indicates repeated episodes of substantial warming and cooling. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming over the past 150 years. The IPCC expressed in their Sixth Assessment Report that the rise and continued growth of atmospheric CO_2 concentrations is unequivocally due to human activities (IPCC 2021). Human influence has warmed the atmosphere, ocean, and land, which has led the climate to warm at an unprecedented rate in the last 2,000 years. It is estimated that between the period of 1850 through 2019, a total of 2,390 gigatons of anthropogenic CO_2 was emitted. It is likely that anthropogenic activities have increased the global

[1] The Intergovernmental Panel on Climate Change's (2021) *Sixth Assessment Report* determined that methane has a GWP of 30. However, the 2017 Climate Change Scoping Plan published by the California Air Resources Board uses a GWP of 25 for methane, consistent with the Intergovernmental Panel on Climate Change's (2007) *Fourth Assessment Report*. Therefore, this analysis utilizes a GWP of 25.

surface temperature by approximately 1.07 degrees Celsius between the years 2010 through 2019 (IPCC 2021).

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat-trapping effect of GHGs, the earth's surface would be about 33 degrees Celsius (°C) cooler (World Meteorological Organization 2013). However, since 1750, estimated concentrations of CO_2, CH_4, and N_2O in the atmosphere have increased by 47 percent, 156 percent, and 23 percent, respectively, primarily due to human activity (IPCC 2021). GHG emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, are believed to have elevated the concentration of these gases in the atmosphere beyond the level of concentrations that occur naturally.

a. Greenhouse Gas Emissions Inventory

Global Emissions Inventory

Worldwide anthropogenic GHG emissions totaled 47,000 million metric tons (MT) of CO_2e in 2015, which is a 43 percent increase from 1990 GHG levels (USEPA 2023b). Specifically, 34,522 million metric tons (MMT) of CO_2e of CO_2, 8,241 MMT of CO_2e of CH_4, 2,997 MMT of CO_2e of N_2O, and 1,001 MMT of CO_2e of fluorinated gases were emitted in 2015. The largest source of GHG emissions were energy production and fuel use from vehicles and buildings, which accounted for 75 percent of the global GHG emissions. Agriculture uses and industrial processes contributed 12 percent and six percent, respectively. Waste sources contributed three percent and international transportation sources contributed two percent. These sources account for approximately 98 percent because there was a net sink of two percent from land-use change (including afforestation/reforestation and emissions removals by other land use activities) (USEPA 2023b).

United States Emissions Inventory

Total United States (U.S.) GHG emissions were 6,558 MMT of CO_2e in 2019. Emissions decreased by 1.7 percent from 2018 to 2019. Since 1990, total U.S. emissions have increased by an average annual rate of 0.06 percent for a total increase of 1.8 percent between 1990 and 2019. The decrease from 2018 to 2019 reflects the combined influences of several long-term trends, including population changes, economic growth, energy market shifts, technological changes such as improvements in energy efficiency, and decrease carbon intensity of energy fuel choices. In 2019, the industrial and transportation end-use sectors accounted for 30 percent and 29 percent, respectively, of nationwide GHG emissions; while the commercial and residential end-use sectors accounted for 16 percent and 15 percent of nationwide GHG emissions, respectively, with electricity emissions distributed among the various sectors (USEPA 2023c).

California Emissions Inventory

Based on the California Air Resources Board (CARB) California Greenhouse Gas Inventory for 2000-2019, California produced 418.2 MMT of CO_2e in 2019, which is 7.2 MMT of CO_2e lower than 2018 levels. The major source of GHG emissions in California is the transportation sector, which comprises 40 percent of the state's total GHG emissions. The industrial sector is the second largest source, comprising 21 percent of the state's GHG emissions, while electric power accounts for approximately 14 percent (CARB 2021). The magnitude of California's total GHG emissions is due in part to its large size and large population compared to other states. However, its relatively mild climate is a factor that reduces California's per capita fuel use and GHG emissions as compared to other states. In 2016, the State of California achieved its 2020 GHG emission reduction target of reducing emissions to 1990 levels, as emissions fell below 431 MMT of CO_2e (CARB 2021).

Local Emissions Inventory

Based on the City's Climate Action Framework, the City generated approximately 65,711 MT of CO_2e in 2018. Transportation was the major source accounting for 66.7 percent of the total, followed by building and energy use (24.5 percent) and then solid waste (8.8 percent). The remaining GHG emissions are attributed to water and wastewater (City of Sebastopol 2022).

b. Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Each of the past three decades has been warmer than all the previous decades on record, and the decade from 2000 through 2010 has been the warmest. The observed global mean surface temperature from 2015 to 2017 was approximately 1.0°C higher than the average global mean surface temperature over the period from 1880 to 1900 (National Oceanic and Atmospheric Administration 2020). Furthermore, several independently analyzed data records of global and regional Land-Surface Air Temperature obtained from station observations jointly indicate that Land-Surface Air Temperature and sea surface temperatures have increased.

According to *California's Fourth Climate Change Assessment*, statewide temperatures from 1986 to 2016 were approximately 0.6 to 1.1°C higher than those recorded from 1901 to 1960. Potential impacts of climate change in California may include reduced water supply from snowpack, sea level rise, more extreme heat days per year, larger forest fires, and more drought years (State of California 2018). In addition to statewide projections, *California's Fourth Climate Change Assessment* includes regional reports that summarize climate impacts and adaptation solutions for nine regions of the state and regionally specific climate change case studies (State of California 2018). However, while there is growing scientific consensus about the possible effects of climate change at a global and statewide level, current scientific modeling tools are unable to predict what local impacts may occur with a similar degree of accuracy. A summary follows of some of the potential effects that could be experienced in California because of climate change.

Air Quality

Scientists project that the annual average maximum daily temperatures in California could rise by 2.4 to 3.2°C in the next 50 years and by 3.1 to 4.9°C in the next century (State of California 2018). Higher temperatures are conducive to air pollution formation, and rising temperatures could therefore result in worsened air quality in California. As a result, climate change may increase the concentration of ground-level ozone. The magnitude of the effect of the increased concentration of ground-level ozone, and therefore its indirect effects, are uncertain. In addition, as temperatures have increased in recent years, the area burned by wildfires throughout the state has increased, and wildfires have occurred at higher elevations in the Sierra Nevada Mountains (State of California 2018). If higher temperatures continue to be accompanied by an increase in the incidence and extent of large wildfires, air quality could worsen. Severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains could tend to temporarily clear the air of particulate pollution, which would effectively reduce the number of large wildfires and thereby ameliorate the pollution associated with them (California Natural Resources Agency 2009).

Water Supply

Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future precipitation trends and water supplies in California. Year-to-year variability in statewide precipitation levels has increased since 1980, meaning that wet and dry precipitation extremes have become more common (California Department of Water Resources 2018). This uncertainty regarding future precipitation trends complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The average early spring snowpack in the western U.S., including the Sierra Nevada Mountains, decreased by about 10 percent during the last century. During the same period, sea level rose over 0.15 meter along the central and southern California coasts (State of California 2018). The Sierra snowpack provides most of California's water supply as snow that accumulates during wet winters is released slowly during the dry months of spring and summer. A warmer climate is predicted to reduce the fraction of precipitation that falls as snow and the amount of snowfall at lower elevations, thereby reducing the total snowpack (State of California 2018). Projections indicate that average spring snowpack in the Sierra Nevada and other mountain catchments in central and northern California will decline by approximately 66 percent from its historical average by 2050 (State of California 2018).

Hydrology and Sea Level Rise

Climate change could affect the intensity and frequency of storms and flooding (State of California 2018). Furthermore, climate change could induce substantial sea level rise in the coming century. Rising sea level increases the likelihood of and risk from flooding. The rate of increase of global mean sea levels between 1993 to 2022, observed by satellites, is approximately 3.5 millimeters per year, double the twentieth century trend of 1.6 millimeters per year (World Meteorological Organization 2013; National Aeronautics and Space Administration 2023). Sea levels are rising faster now than in the previous two millennia, and the rise will probably accelerate, even with robust GHG emission control measures. While the City is not close to the Pacific coast, sea level rise may jeopardize California's water supply due to saltwater intrusion and induce groundwater flooding and/or exposure of buried infrastructure (State of California 2018).

Agriculture

California has an over $50 billion annual agricultural industry that produces over a third of the country's vegetables and two-thirds of the country's fruits and nuts (California Department of Food and Agriculture 2020). Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, certain regions of agricultural production could experience water shortages of up to 16 percent, which would increase water demand as hotter conditions lead to the loss of soil moisture. In addition, crop yield could be threatened by water-induced stress and extreme heat waves, and plants may be susceptible to new and changing pest and disease outbreaks (State of California 2018). Temperature increases could also change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (California Climate Change Center 2006).

Ecosystems

Climate change and the potential resultant changes in weather patterns could have ecological effects on the global and local scales. Soil moisture is likely to decline in many regions because of higher temperatures, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals: timing of ecological events; geographic distribution and range of species; species composition and the incidence of nonnative species within communities; and ecosystem processes, such as carbon cycling and storage (Parmesan 2006; State of California 2018).

4.6.2 Regulatory Setting

a. Federal Regulations

Federal Clean Air Act

The U.S. Supreme Court determined in *Massachusetts et al. v. Environmental Protection Agency et al.* ([2007] 549 U.S. 05-1120) that the USEPA has the authority to regulate motor vehicle GHG emissions under the federal Clean Air Act. The USEPA issued a Final Rule for mandatory reporting of GHG emissions in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines and requires annual reporting of emissions. In 2012, the USEPA issued a Final Rule that established the GHG permitting thresholds that determine when Clean Air Act permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities.

In *Utility Air Regulatory Group v. Environmental Protection Agency* (134 Supreme Court 2427 [2014]), the U.S. Supreme Court held the USEPA may not treat GHGs as an air pollutant for purposes of determining whether a source can be considered a major source required to obtain a Prevention of Significant Deterioration or Title V permit. The Court also held that Prevention of Significant Deterioration permits otherwise required based on emissions of other pollutants may continue to require limitations on GHG emissions based on the application of Best Available Control Technology.

Safer Affordable Fuel-Efficient Vehicles Rule

On September 27, 2019, the USEPA and the National Highway Traffic Safety Administration published the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program. The SAFE Rule Part One revokes California's authority to set its own GHG emissions standards and to adopt its own zero-emission vehicle mandates. On April 30, 2020, the USEPA and the National Highway Traffic Safety Administration published Part Two of the SAFE Vehicles Rule, which revised corporate average fuel economy and CO_2 emissions standards for passenger cars and trucks of model years 2021-2026, such that the standards increase by approximately 1.5 percent each year through model year 2026, as compared to the approximately 5 percent annual increase required under the 2012 standards (National Highway Traffic Safety Administration 2023).

Construction Equipment Fuel-Efficiency Standard

USEPA sets emission standards for construction equipment. The first federal standards (Tier 1) were adopted in 1994 for all off-road engines over 50 horsepower (hp) and were phased in by 2000. A new standard was adopted in 1998 that introduced Tier 1 for all equipment below 50 hp and established the Tier 2 and Tier 3 standards. The Tier 2 and Tier 3 standards were phased in by 2008 for all equipment. The current iteration of emissions standards for construction equipment are the Tier 4 efficiency requirements, which are contained in 40 Code of Federal Regulations Parts 1039, 1065, and 1068 (originally adopted in 69 Federal Register 38958 [June 29, 2004] and most recently updated in 2014 [79 Federal Register 46356]). Emissions requirements for new off-road Tier 4 vehicles were completely phased in by the end of 2015.

b. State Regulations

CARB is responsible for the coordination and oversight of State and local air pollution control programs in California. There are numerous regulations aimed at reducing the state's GHG emissions. These initiatives are summarized below.

California Advanced Clean Cars Program

Assembly Bill (AB) 1493 (2002), California's Advanced Clean Cars program (referred to as "Pavley"), requires CARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, the USEPA granted the waiver of Clean Air Act preemption to California for its GHG emission standards for motor vehicles, beginning with the 2009 model year, which allows California to implement more stringent vehicle emission standards than those promulgated by the USEPA. Pavley I regulates model years from 2009 to 2016 and Pavley II, now referred to as "LEV (Low Emission Vehicle) III GHG," regulates model years from 2017 to 2025. The Advanced Clean Cars program coordinates the goals of the LEV, Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs and would provide major reductions in GHG emissions. By 2025, the rules will be fully implemented, and new automobiles will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions from their model year 2016 levels (CARB 2011).

Executive Order B-48-18: Zero-Emission Vehicles

On January 26, 2018, Governor Brown signed Executive Order B-48-18 requiring all State entities to work with the private sector to have at least 5 million ZEVs on the road by 2030, as well as install 200 hydrogen fueling stations and 250,000 electric vehicle (EV) charging stations by 2025. It specifies that 10,000 of the EV charging stations should be direct current fast chargers. This order also requires all State entities to continue to partner with local and regional governments to streamline the installation of ZEV infrastructure. The Governor's Office of Business and Economic Development is required to publish a Plug-in Charging Station Design Guidebook and update the 2015 Hydrogen Station Permitting Guidebook to aid in these efforts. All State entities are required to participate in updating the 2016 ZEV Action Plan, along with the 2018 ZEV Action Plan Priorities Update, which includes and extends the 2016 ZEV Action Plan (Governor's Interagency Working Group on Zero-Emission Vehicles 2016, 2018) to help expand private investment in ZEV infrastructure with a focus on serving low-income and disadvantaged communities.

Executive Order N-79-20

Governor Gavin Newsom signed Executive Order N-79-20 in September 2020, which sets a Statewide goal that 100 percent of all new passenger car and truck sales in the State will be zero-emissions by 2035. It also sets a goal that 100 percent of statewide new sales of medium- and heavy-duty vehicles will be zero emissions by 2045, where feasible, and for all new sales of drayage trucks to be zero emissions by 2035. Additionally, the Executive Order targets 100 percent of new off-road vehicle sales in the State to be zero emission by 2035. CARB is responsible for implementing the new vehicle sales regulation.

California Global Warming Solutions Act of 2006 (Assembly Bill 32, Senate Bill 32, and Assembly Bill 1279)

The "California Global Warming Solutions Act of 2006," (AB 32), outlines California's major legislative initiative for reducing GHG emissions. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan that outlines the main state strategies for reducing GHG emissions to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions. Based on this guidance, CARB approved a 1990 statewide GHG level and 2020 target of 431 MMT of CO_2e, which was achieved in 2016. CARB approved the Scoping Plan on December 11, 2008, which included GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among others (CARB 2008).

The CARB approved the 2013 Scoping Plan update in May 2014. The update defined the CARB's climate change priorities for the next five years, set the groundwork to reach post-2020 statewide goals, and highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan.

On September 8, 2016, the governor signed Senate Bill (SB) 32 into law, extending the California Global Warming Solutions Act of 2006 by requiring the state to further reduce GHG emissions to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, the CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, and implementation of recently adopted policies and legislation, such as SB 1383 and SB 100 (discussed below). The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies.

AB 1279, "The California Climate Crisis Act," was passed on September 16, 2022 and declares the State would achieve net zero greenhouse gas emissions as soon as possible, but no later than 2045, and to achieve and maintain net negative greenhouse gas emissions thereafter. In addition, the bill states that the State would reduce GHG emissions by 85 percent below 1990 levels no later than 2045. The 2022 Scoping Plan lays out a path to achieve AB 1279 targets (CARB 2022). The actions and outcomes in the 2022 Scoping Plan would achieve significant reductions in fossil fuel combustion by deploying clean technologies and fuels, further reductions in short-lived climate pollutants, support for sustainable development, increased action on natural and working lands to reduce emissions and sequester carbon, and the capture and storage of carbon.

Senate Bill 375

The Sustainable Communities and Climate Protection Act of 2008 (SB 375), signed in August 2008, enhances the state's ability to reach AB 32 goals by directing the CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. SB 375 aligns regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPOs) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the MPO's Regional Transportation Plan (RTP). Qualified projects consistent with an approved SCS or Alternative Planning Strategy (categorized as "transit priority projects") can receive incentives to streamline CEQA processing.

The City of Sebastopol is within the planning area of the Association of Bay Area Governments (ABAG). ABAG was assigned targets of a 10 percent reduction in GHGs from transportation sources by 2020 and a 19 percent reduction in GHGs from transportation sources by 2035 (CARB 2023).

Assembly Bill 1493 (Reduce GHG Emissions from Vehicle Use)

AB 1493 (Chapter 200, Statutes of 2002), known as the Pavley Bill, amended Health and Safety Code Sections 42823, and added Section 43018.5 requiring CARB to develop and adopt regulations that achieve maximum feasible and cost-effective reduction of GHG emissions from passenger vehicles, light-duty trucks, and other vehicles used for noncommercial personal transportation in California.

Assembly Bill 1007 (State Alternative Fuels Plan)

AB 1007 (Chapter 371, Statutes of 2005) required the California Energy Commission (CEC) to prepare a State plan to increase the use of alternative fuels in California. The CEC prepared the State Alternative Fuels Plan (SAF Plan) in partnership with CARB and in consultation with other federal, State, and local agencies. The SAF Plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The SAF Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce GHG emissions, and increase in-State production of biofuels without causing a significant degradation of public health and environmental quality.

CARB In-Use On-Road and Off-Road Diesel Rules

The CARB rule imposes limits on idling, restricts the addition of older vehicles, and requires the retirement or replacement of older engines depending on their fleet size category. This policy indirectly impacts energy consumption.

More specifically, CARB is also charged with developing air pollution control regulations based upon the best available control measures and implementing feasible control measures under the State and Federal Clean Air Act (Health & Safety Code, Sections 39602.5, 39667, 43013, subdivisions (a) and (h), 43018, 40600, 40601, 40612(a)(2) and (c)(1)(A)). Pursuant to these statutory authorities, more stringent emission standards were adopted in 2004 for off-road construction equipment (i.e. "Tier 4" standards) (40 Code of Federal Regulations Parts 1039, 1065, and 1068; California Code of Regulations, title 13, Section 2025; AR 2854). CARB also adopted emission standards for on-road heavy duty diesel vehicles (i.e., haul trucks). (California Code of Regulations, title 13, Section 1956.8.) These haul truck regulations mandate fleet ensuring that nearly all on-road diesel trucks will have 2010 model year engines or equivalent [i.e., Tier 4] by 2023.

California Integrated Waste Management Act (Assembly Bill 341)/Assembly Bill 1826 (Mandatory Recycling/Composting)

The California Integrated Waste Management Act of 1989, as modified by AB 341, requires each jurisdiction's source reduction and recycling element to include an implementation schedule that shows diversion away from landfills of 75 percent of all solid waste by 2020 and annually thereafter. AB 1826 requires recycling of organic waste (i.e., composting). All businesses and public entities that generate four or more cubic yards of solid waste per week and multi-family residential dwellings that have five or more units are required to recycle and compost.

Senate Bill 1383

Adopted in September 2016, SB 1383 requires CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. SB 1383 requires the strategy to achieve the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SB 1383 also requires the California Department of Resources Recycling and Recovery (CalRecycle), in consultation with the CARB, to adopt regulations that achieve specified targets for reducing organic waste in landfills.

Senate Bill 100

Adopted on September 10, 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the state's Renewables Portfolio Standard (RPS) Program, which was last updated by SB 350 in 2015. SB 100 requires electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045. The 2020 goal was met, with approximately 36 percent of electricity coming from renewable sources in March 2021 (CARB 2021b).

Executive Order B-55-18

On September 10, 2018, the former Governor Brown issued Executive Order B-55-18, which established a new statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing statewide GHG reduction targets established by SB 375, SB 32, SB 1383, and SB 100.

Senate Bill 1020

Senate Bill 1020 (SB 1020), signed into law on September 16, 2022, requires renewable energy and zero-carbon resources to supply 90 percent of all retail electricity sales by 2035, 95 percent by 2040, and 100 percent by 2045. All State agencies facilities must be served by 100 percent renewable and zero-carbon resources by 2030. SB 1020 also requires the Public Utilities Commission, Energy Commission, and CARB to issue a joint progress report outlining the reliability of the electrical grid with a focus on summer reliability and challenges and gaps. Additionally, SB 1020 requires the Public Utilities Commission to define energy affordability and use energy affordability metrics to develop protections, incentives, discounts, or new programs for residential customers facing hardships due to energy or gas bills.

CARB Gas Appliances Sales Ban

As part of the 2022 State Implementation Plan, CARB adopted a ban on new sales of natural gas heaters, water heaters, and furnaces by 2030 in September of 2022. This new measure is intended to reduce emissions from new residential and commercial space and water heaters sold in the State. An emission standard for space and water heaters will go into effect in 2030. Beginning in 2030, 100 percent of the sales of new natural gas-powered heaters and water heaters would need to comply with the emission standard, such as putting in electric heaters or other zero-emission options.

California Building Standards Code

The California Code of Regulations (CCR) Title 24 is referred to as the California Building Standards Code. It consists of a compilation of several distinct standards and codes related to building construction, including plumbing, electrical, interior acoustics, energy efficiency, and accessibility for persons with physical and sensory disabilities. The California Building Standards Code's energy-efficiency and green building standards are outlined below. These standards are updated every three years and the project would be subject to the 2022 California Building Standards.

Part 6 – Building Energy Efficiency Standards/Energy Code

CCR Title 24, Part 6 is the Building Energy Efficiency Standards or California Energy Code. This code, originally enacted in 1978, establishes energy-efficiency standards for residential and non-residential buildings to reduce California's energy demand. New construction and major renovations must demonstrate their compliance with the current Energy Code through submittal and approval of a Title 24 Compliance Report to the local building permit review authority and the CEC. The current iteration is the 2022 Title 24 standards. The California Building Standards Code's energy-efficiency and green building standards are outlined below.

Part 11 – California Green Building Standards

The California Green Building Standards Code, referred to as CALGreen, was added to Title 24 as Part 11, first in 2009 as a voluntary code, which then became mandatory effective on January 1, 2011 (as part of the 2010 California Building Standards Code). The 2022 CALGreen includes mandatory minimum environmental performance standards for all ground-up new construction of residential and non-residential structures. It also includes voluntary tiers with stricter environmental performance standards for these same categories of residential and non-residential buildings. Local jurisdictions must enforce the minimum mandatory CALGreen standards and may adopt additional amendments for stricter requirements.

The mandatory standards require:

- Minimum 20 percent reduction in indoor water use relative to specified baseline levels;[2]
- Waste Reduction:
  - Minimum 65 percent non-hazardous construction/demolition waste diverted from landfills;
  - Non-residential and Multifamily dwellings with 5 or more units shall provide readily accessible areas identified for the depositing, storage and collection of nonhazardous

[2] Similar to the compliance reporting procedure for demonstrating Energy Code compliance in new buildings and major renovations, compliance with the CALGreen water reduction requirements must be demonstrated through completion of water use reporting forms. Buildings must demonstrate a 20 percent reduction in indoor water use by either showing a 20 percent reduction in the overall baseline water use as identified in CALGreen or a reduced per-plumbing-fixture water use rate.

    - materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastic, organic waste, and metals;
    - Nonresidential: 100 percent of trees, stumps, rocks and associated vegetation soils resulting from primary land clearing shall be reused or recycled.

- Inspections of energy systems to ensure optimal working efficiency;
- Electric Vehicle (EV) Charging for New Construction:[3]
    - Multifamily dwellings, hotels/motels with less than 20 units/rooms: Designation of at least 10 percent of the total number of parking spaces shall be EV capable and at least 25 percent of the total number of parking spaces shall be EV Ready.
    - Multifamily dwellings, hotels/motels with greater than 20 units/rooms: Designation of at least 10 percent of the total number of parking spaces shall be EV capable, at least 25 percent of the total number of parking spaces shall be EV Ready, and at least 5 percent of the total number of parking spaces shall be equipped with a Level 2 Charging Station.

The CALGreen voluntary standards are only mandatory if a local ordinance requires them. Since the City has not made any of the voluntary measures mandatory, the following voluntary standards would not be applicable to the project:

- Deconstruct existing buildings and reuse applicable salvaged materials;
- Residential Bicycle Parking:
    - Multifamily/hotel/motel short-term parking: Provide permanently anchored bicycle racks within 100 feet of visitor's entrance for 5 percent of visitor motorized vehicle parking capacity (minimum 1 two-bike capacity rack).

The CALGreen voluntary standards are divided into two tiers. Tier 1 adds additional requirements beyond the mandatory measures, whereas Tier 2 further increases the requirements.

- **Tier I**
    - Stricter energy efficiency requirements;
    - Stricter water conservation requirements for specific fixtures;
    - Minimum 65 percent reduction in construction waste with third-party verification, Minimum 10 percent recycled content for building materials;
    - Minimum 20 percent permeable paving;
    - Minimum 20 percent cement reduction;
    - Multifamily developments/hotels/motels: Minimum 35 percent of total parking spaces shall be EV ready and for projects with 20 or more dwelling units/rooms a minimum of 10 percent of the total number of parking spaces shall be equipped with EV charging stations;

- **Tier II**
    - Stricter energy efficiency requirements,
    - Stricter water conservation requirements for specific fixtures;

[3] EV Capable = a vehicle space with electrical panel space and load capacity to support a branch circuit and necessary raceways to support EV charging. EV Ready = a vehicle space which is provided with a branch circuit and any necessary raceways to accommodate EV charging stations including a receptacle for future installation of a charger. See 2022 California Green Building Standard Code, Title 24 Part 11 for full explanation of mandatory measures including exceptions.

- Minimum 75 percent reduction in construction waste with third-party verification,
- Minimum 15 percent recycled content for building materials;
- Minimum 30 percent permeable paving;
- Minimum 25 percent cement reduction;
- Multifamily developments/hotels/motels: Minimum 40 percent of total parking spaces shall be EV ready and for projects with 20 or more dwelling units/rooms a minimum of 15 percent of the total number of parking spaces shall be equipped with EV charging stations.

c. Regional and Local Regulations

Plan Bay Area 2050

Plan Bay Area 2050 is a State-mandated, integrated long-range transportation, land-use, and housing plan, known as an RTP/SCS, that would support a growing economy, provide more housing and transportation choices and reduce transportation-related pollution in the nine-county San Francisco Bay Area. Plan Bay Area 2050 builds on earlier efforts to develop an efficient transportation network and grow in a financially and environmentally responsible way. Plan Bay Area 2050 focuses on advancing equity and improving resiliency in the Bay Area by creating strategies in the following four elements: Housing, Economy, Transportation, and Environment. The Plan discusses how the future is uncertain due to anticipated employment growth, lack of housing options, and outside forces, such as climate change and economic turbulence. These uncertainties will impact growth in the Bay Area and exacerbate issues for those who are historically and systemically marginalized and underserved and excluded. Thus, Plan Bay Area 2050 has created strategies and considered investments that will serve those systemically underserved communities and provide equitable opportunities. The Plan presents a total of 35 strategies to outline how the $1.4 trillion dollar investment would be utilized. The strategies include, but are not limited to, the following: providing affordable housing, allowing higher-density in proximity to transit-corridors, optimizing the existing roadway network, creating complete streets, providing subsides for public transit, reducing climate emissions, and expanding open space area. To bring these strategies to fruition, it will require participation by agencies, policymakers, and the public. An implementation plan is also included as part of the Plan to assess the requirements needed to carry out the strategies, identify the roles of pertinent entities, create an appropriate method to implement the strategies, and create a timeline for implementation.

Sebastopol Climate Action Framework

The City of Sebastopol adopted its Climate Action Framework on July 19, 2022, which includes goals to reduce citywide GHG emissions to net zero by 2030; sequester carbon from the atmosphere using nature-based solutions; prepare for climate impacts that cannot be avoided; and center equity and community engagement in the City's climate actions. The Climate Action Framework contains 26 action area goals for six areas: transportation, sustainable land use, buildings and clean energy, consumption and waste, community, and city operations and leadership. The following action area goals related to GHG emissions are applicable to the proposed project:

Goal T2: Reduce vehicle miles traveled (VMT) by Sebastopol residents.

Goal T5: Support a rapid, equitable transition to electric vehicles (EVs) for trips requiring a personal vehicle.

Goal LU1: Promote infill housing at appropriate densities within Sebastopol's voter-approved urban growth boundary that reduces VMT by locating housing within walking or biking distance of basic daily needs.

Goal BE1: Reduce greenhouse gas (GHG) emissions from buildings and support better community health by eliminating natural gas use in new buildings, electrifying existing structures, minimizing embodied carbon in new construction and remodels, and making all buildings more energy efficient.

Goal BE3: Expand the installation of solar panels and other renewable energy sources, both locally and in partnership with other entities in Sonoma County, to further decarbonize Sebastopol's electricity supply.

Goal BE4: Maximize water conservation and reuse.

Goal CW1: Reach Zero Waste by 2030 by minimizing solid waste production, increasing recycling, composting, and food recovery, and supporting community sharing, mending, and reuse.

Sebastopol General Plan

The City of Sebastopol adopted its General Plan on November 15, 2016, which includes the following Elements: Land Use, Circulation, Community Services and Facilities, Conservation and Open Space, Noise, Community Design, Safety, Economic Vitality, Community Health and Wellness, and Housing. The following goals and policies related to GHG emissions are applicable to the proposed project:

Goal CIR 2: Maintain and Expand a Safe and Efficient Pedestrian, Bicycle, and Transit Network that Connects Neighborhoods with Key Destinations to Encourage Travel by Non-Automobile Modes while also Improving Public Health.

Policy CIR 2-14 Provide secure bicycle racks in places such as the Downtown, at commercial areas, park and ride transit facilities, schools, multiple unit residential developments, and **other** locations where there is a concentration of residents, visitors, students, or employees.

Goal CIR 3: Coordinate Circulation Facilities with Land Use and Development Patterns to Create an Environment that Encourages Walking, Bicycling, and Transit Use.

Policy CIR 3-3 Prioritize high-density and mixed land use patterns that promote transit and pedestrian travel along transit corridors.

Policy CIR 3-4 Design developments to include features that encourage walking, bicycling, and transit use. Design features shall include bus turnouts, transit shelters and benches, and pedestrian access points between subdivisions and between adjacent related land uses.

Goal CIR 5: Coordinate Circulation Facilities with Land Use and Development Patterns to Create an Environment that Encourages Walking, Bicycling, and Transit Use.

Policy CIR 5-3 Support the establishment and expansion of a regional network of electric vehicle charging stations and encourage the expanded use of electric vehicles.

Goal COS 8: Reduce Emissions of Greenhouse Gases from City Operations and Community Sources.

Policy COS 8-5	Encourage public transit, ridesharing and van pooling, shortened and combined motor vehicle trips to work and services, use of bicycles, and walking. Minimize single passenger motor vehicle use.

Goal COS 9: Promote Conservation of Energy and Other Natural Resources.

Policy COS 9-1	Require all new public and privately constructed buildings to meet and comply with CALGreen Tier 1, or successor program, standards.
Policy COS 9-3	Support innovative and green building best management practices including, but not limited to, LEED certification for new development, and encourage project applicants to exceed the most current "green" development standards in the California Code of Regulations (CCR), Title 24, if feasible.
Policy COS 9-5	Promote the use of sustainable and carbon-neutral energy sources in new development.
Policy COS 9-7	Promote efforts and programs, including increased access to clean technologies such as electric vehicles and charging stations, to encourage residents, businesses, and local organizations to use clean energy sources to supplant dirty technologies.
Policy COS 9-9	Promote water conservation among water users.
Policy COS 9-10	Continue to require new development to incorporate water efficient fixtures into design and construction.
Policy COS 9-11	Promote the use of reclaimed water and other non-potable water sources
Policy COS 9-12	Encourage and support the installation and use of rainwater catchment systems and grey water systems on private land and in public projects.
Policy COS 9-13	Continue the citywide recycling program, actively encourage recycling citywide, including the recycling/composting of food waste, and advocate for a regional composting facility.

Sebastopol Municipal Code

Chapter 15.70, Installation of Wood-Burning Appliances, Removal and Operation of Noncertified Wood Heaters, of the SMC permits one wood heater per housing unit and outlines requirements for installing or replacing a wood-burning appliance or heater. Chapter 15.70 also prohibits the use of non-EPA or Northern Sonoma County Pollution Control District certified wood heaters.

Section 17.110.040, Electric Vehicles, of the SMC outlines the following requirements for all new parking lots with 10 or more spaces:

- EV charging infrastructure shall be sized to accommodate a minimum 40-amp 220 VAC charging to a minimum of 50 percent of parking spaces.
- A minimum of 20 percent of vehicle parking spaces and at least one ADA space shall have a fully operational 30-amp electric vehicle service equipment (EVSE) unit installed with a functioning payment system. All electric vehicle charging systems and infrastructure shall be sized for adequate capacity to meet all safety requirements.

- A 20 percent reduction in the total electric vehicle charging spaces required shall be provided for each 50 kW or above DC fast charger, up to a maximum reduction of 40 percent.

Section 17.110.070, Bicycle Parking Requirements, of the SMC requires bicycle parking for multi-family projects and outlines guidelines for number of bicycle parking spaces as well as bicyclie parking design and devices.

4.6.3 Impact Analysis

a. Significance Thresholds and Methodology

Significance Thresholds

Based on Appendix G of the *CEQA Guidelines* a project may be deemed to have a significant impact on GHG emissions if it would:

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

Most individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence on climate change. However, physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (*CEQA Guidelines*, Section 15064[h][1]). The BAAQMD adopted updated thresholds of significance for climate impacts on April 20, 2022 (BAAQMD 2023). Under the updated thresholds, a project must include, at a minimum, the following project design elements, or must be consistent with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b):

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 energy 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 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

b. Achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

Methodology

The City's Climate Action Framework does not constitute as a qualified GHG reduction strategy pursuant to CEQA Guidelines Section 15183.5(b) since it does not forecast projected emissions for activities covered by the plan and was not adopted in a public process following environmental review. Therefore, this section analyzes GHG impacts using project consistency with the BAAQMD-required project design elements for buildings and transportation outlined above under Significance Thresholds.

b. Project Impacts and Mitigation Measures

Threshold 1:	Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Impact GHG-1 THE PROPOSED PROJECT WOULD BE CONSISTENT WITH BAAQMD'S GHG THRESHOLDS FOR BUILDINGS AND TRANSPORTATION. THEREFORE, THE PROJECT WOULD NOT GENERATE GHG EMISSIONS THAT MAY HAVE A SIGNIFICANT IMPACT ON THE ENVIRONMENT. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT WITH IMPLEMENTATION OF MITIGATION MEASURE GHG-1.

Construction

Construction of the project would result in GHG emissions during construction, primarily from fuel consumption associated with heavy equipment, light-duty vehicles, machinery, and generators for lighting. Temporary grid power may also be provided to construction trailers or electric construction equipment that may result in indirect GHG emissions from energy generation. The project would utilize construction contractors that would be required to comply with applicable CARB regulations, such as accelerated retrofitting, repowering, or replacement of heavy-duty diesel on-road and off-road equipment. Construction contractors are required to comply with the provisions of CCR Title 13, sections 2449 and 2485, and CARB regulations, which prohibit diesel-fueled commercial and off-road vehicles from idling for more than five minutes, minimizing unnecessary GHG emissions. Construction equipment would be subject to the USEPA Construction Equipment Fuel Efficiency Standard, which would minimize inefficient fuel consumption and thus GHG emissions. These construction equipment standards (i.e., Tier 4 efficiency requirements) are contained in 40 Code of Federal Regulations Parts 1039, 1065, and 1068. Pursuant to applicable regulatory requirements of CALGreen, the project would comply with construction waste management practices to divert construction and demolition debris from landfills. These practices would result in efficient use of energy during construction and, therefore, would minimize unnecessary GHG emissions. Furthermore, in the interest of cost efficiency, construction contractors would not utilize fuel in a manner that is wasteful or unnecessary, which would also have the effect of minimizing GHG emissions. Therefore, construction of the proposed project would not result in any wasteful, inefficient, or unnecessary energy usage, and the proposed project would be consistent with 1.b of BAAQMD's GHG thresholds.

Operations

The project would result in GHG emissions during operation. The nature of GHG emissions would be typical of those associated with residential uses. GHG emissions would result primarily from building energy usage and fuel consumption associated with vehicle trips.

Transportation

As discussed in Section 4.13, *Transportation*, and based on the Transportation Impact Study prepared by W-Trans on September 6, 2023 (Appendix G), the proposed project would result in a VMT per capita of 13.07, which is below the 15 percent below countywide average VMT per capita of 14.11. Therefore, the proposed project would be consistent with BAAQMD's GHG threshold 2.a.

The proposed project would include pre-wiring for EV charging in garages for all 80 units with solar battery backup and would include 10 percent of EV charging parking spaces (6 spaces out of 41 spaces) for standard surface parking. However, CALGreen Tier 2 requires 15 percent of the total number of parking spaces to be equipped with EV charging stations. Therefore, the proposed project would not comply with EV requirements in the most recently adopted version of CALGreen Tier 2 and would not be consistent with 2.b of BAAQMD's GHG thresholds. Impacts would be potentially significant and Mitigation Measure GHG-1 would be required.

Buildings

Future buildings developed under the project would be served by PG&E, which is required to increase its renewable energy procurement in accordance with SB 100 targets. SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the state's Renewables Portfolio Standard Program. It requires electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045. Future homeowners also have the option to opt into the Sonoma Clean Power (SCP) program, which provides residents and businesses in Sonoma and Mendocino counties with clean energy from more renewable resources, such as geothermal, wind, and solar. The proposed project would construct 80 solar all-electric, three-story townhome-style condominiums and up to 16 ADUs and would not include natural gas appliances or natural gas plumbing. Therefore, the proposed project would be consistent with 1.a of BAAQMD's GHG thresholds.

As discussed in Section 4.16, *Impacts Found to be Less Than Significant*, the proposed project would exceed 2022 Title 24 Building Energy Efficiency Standards by approximately 5 to 10 percent and would include solar which would reduce demand on the electrical grid. Furthermore, the project would include a new, enhanced 6-foot-wide pedestrian pathway with public access to connect the West County Trail to Gravenstein Highway, 96 bicycle parking spaces, and a bicycle repair station to facilitate pedestrian and bicycle transportation and reduce the use of gasoline vehicles. Therefore, project operation would not result in potentially significant environmental effects due to the wasteful, inefficient, or unnecessary consumption of energy, and the proposed project would be consistent with BAAQMD's GHG threshold 1.b.

Mitigation Measures

GHG-1 CALGreen Tier 2 EV Requirements

Prior to issuance of building permits, the City Engineer and the Chief Building Official shall confirm that the applicant shall include the following design feature as part of the project to be consistent with CALGreen Tier 2 EV standards:

> A minimum of 15 percent of the total number of parking spaces shall be equipped with EV charging stations.

Significance After Mitigation

Implementation of Mitigation Measure GHG-1 would ensure the project would be consistent with CALGreen Tier 2 EV standards, as well as 2.b of BAAQMD's GHG thresholds. Impacts would be less than significant with mitigation.

Threshold 2:	Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Impact GHG-2 THE PROPOSED PROJECT WOULD BE CONSISTENT WITH GOALS AND POLICIES FROM CARB'S 2022 SCOPING PLAN, PLAN BAY AREA 2050, THE CITY'S CLIMATE ACTION FRAMEWORK, AND THE GENERAL PLAN. THEREFORE, THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

Applicable plans and policies to the project for reducing GHG emissions includes CARB's 2022 Scoping Plan, Plan Bay Area 2050, the City's Climate Action Framework, and the City's General Plan. The project would result in a potentially significant impact if it would conflict with these plans.

Project Consistency with 2022 Scoping Plan

The principal State plans and policies for reducing GHG emissions are SB 32 and AB 1279. The quantitative goal of SB 32 is to reduce GHG emissions to 40 percent below 1990 levels by 2030; and the goal of AB 1279 is to achieve net zero greenhouse gas emissions no later than 2045, and reduce GHG emissions by 85 percent below 1990 levels no later than 2045. The 2022 Scoping Plan expands upon earlier plans to include the AB 1279 targets. The 2022 Scoping Plan's strategies that are applicable to the proposed project include reducing fossil fuel use and vehicle miles traveled; decarbonizing the electricity sector, maximizing recycling and diversion from landfills; and increasing water conservation. The project would be consistent with these goals since future development would be required to comply with the latest Title 24 Green Building Code and Building Efficiency Energy Standards, as well as the AB 341 waste diversion goal of 75 percent and recycle organic wastes pursuant to SB 1383. The proposed project would be located within a half mile of Sonoma County Transit (SCT) Routes 20, 24, and 26, and would be located in proximity to several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County- Trail and existing bicycle lanes along State Route 116 (SR 116) between the northern city limit and North Main Street, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116. The proposed project would include an all-electric design and would not include natural gas appliances or plumbing. Electricity to the project site would be provided by Pacific Gas and Electric (PG&E), and the project would utilize renewable electricity through the use of solar panels. Homeowners also have the option to opt into the SCP program, which provides residents and businesses in Sonoma and Mendocino counties with clean energy from more renewable resources, such as geothermal, wind, and solar. Therefore, the project would not conflict with the 2022 Scoping Plan and this impact would be less than significant.

Project Consistency with Plan Bay Area 2050

Table 4.6-1 shows the proposed project's consistency with Plan Bay Area 2050.

Table 4.6-1 Project Consistency with Plan Bay Area 2050

Measure	Project Consistency
H3. Allow a greater mix of housing densities and types in Growth Geographies. Allow a variety of housing types at a range of densities to be built in Priority Development Areas, select Transit-Rich Areas and select High-Resource Areas.	**Consistent.** The proposed project would include construction of 80 solar all-electric, three-story townhome-style condominiums, with the potential for up to 16 Americans with Disability Act (ADA) accessible accessory dwelling units (ADUs) in a neighborhood characterized by a mix of uses including residential, light industrial, commercial, and educational. The project would diversify housing densities and would be located near transit. The proposed project would be located within a half mile of SCT Routes 20, 24, and 26, and would be located in proximity to several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County-Joe Rodota Trail and existing bicycle lanes along SR 116 between the north city limit and North Main Street, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116.
T8. Build a Complete Streets network. Enhance streets to promote walking, biking and other micro-mobility through sidewalk improvements, car-free slow streets, and 10,000 miles of bike lanes or multi-use paths.	**Consistent**. The proposed project would include a new, enhanced 6-foot-wide pedestrian pathway with public access to connect the West County Trail to Gravenstein Highway, 96 bicycle parking spaces, and a bicycle repair station to facilitate pedestrian and bicycle transportation and reduce the use of gasoline vehicles. The proposed project would also be located in proximity to several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County-Joe Rodota Trail and existing bicycle lanes along SR 116 between the north city limit and North Main Street, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116 which would encourage future residents to bicycle.
EN4. Maintain urban growth boundaries. Using urban growth boundaries and other existing environmental protections, focus new development within the existing urban footprint or areas otherwise suitable for growth, as established by local jurisdictions.	**Consistent.** The project would maintain urban growth boundaries through infill development on an underdeveloped site.
EN8. Expand clean vehicle initiatives. Expand investments in clean vehicles, including more fuel-efficient vehicles and electric vehicle subsidies and chargers.	**Consistent.** The proposed project would include pre-wiring for EV charging in garages for all 80 units with solar battery backup and include 10 percent of EV charging parking spaces (6 spaces out of 41 spaces) for standard surface parking. As discussed above under Impact GHG-1, the proposed project would be required to implement Mitigation Measure GHG-1, which would ensure consistency with CALGreen's Tier 2 EV requirements.

Source: ABAG 2021

Project Consistency with the City's Climate Action Framework

Table 4.6-2 shows the proposed project's consistency with the City's Climate Action Framework.

Table 4.6-2 Project Consistency with the City's Climate Action Framework

Goal	Project Consistency
Goal T2: Reduce vehicle miles traveled (VMT) by Sebastopol residents.	**Consistent.** The proposed project would include construction of 80 solar all-electric, three-story townhome-style condominiums, with the potential for up to 16 Americans with Disability Act (ADA) accessible accessory dwelling units (ADUs) in a neighborhood characterized by a mix of uses including residential, light industrial, commercial, and educational. The project would diversify housing densities and would be located near transit. The proposed project would be located within a half mile of SCT Routes 20, 24, and 26, and would be located in proximity to several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County and existing bicycle lanes along SR 116 between the north city limit and North Main Street, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116. The proposed project would also include a new, enhanced 6-foot-wide pedestrian pathway with public access to connect the West County Trail to Gravenstein Highway, 96 bicycle parking spaces, and a bicycle repair station to facilitate pedestrian and bicycle transportation and reduce the use of gasoline vehicles.
Goal T5: Support a rapid, equitable transition to electric vehicles (EVs) for trips requiring a personal vehicle.	**Consistent**. The proposed project would include pre-wiring for EV charging in garages for all 80 units with solar battery backup and include 10 percent of EV charging parking spaces (6 spaces out of 41 spaces) for standard surface parking. As discussed above under Impact GHG-1, the proposed project would be required to implement Mitigation Measure GHG-1, which would ensure consistency with CALGreen's Tier 2 EV requirements.
Goal LU1: Promote infill housing at appropriate densities within Sebastopol's voter-approved urban growth boundary that reduces VMT by locating housing within walking or biking distance of basic daily needs.	**Consistent**. The project would maintain urban growth boundaries through infill development on an underdeveloped site. The proposed project would be located within a half mile of SCT Routes 20, 24, and 26, and would be located in proximity to several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County Trail and existing bicycle lanes along SR 116 between the north city limit and North Main Street, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116. The proposed project would also include a new, enhanced 6-foot-wide pedestrian pathway with public access to connect the West County Trail to Gravenstein Highway, 96 bicycle parking spaces, and a bicycle repair station to facilitate pedestrian and bicycle transportation and reduce VMT.
Goal BE1: Reduce greenhouse gas (GHG) emissions from buildings and support better community health by eliminating natural gas use in new buildings, electrifying existing structures, minimizing embodied carbon in new construction and remodels, and making all buildings more energy efficient.	**Consistent.** The proposed project would include an all-electric design and would utilize renewable electricity through the use of solar panels.
Goal BE3: Expand the installation of solar panels and other renewable energy sources, both locally and in partnership with other entities in Sonoma County, to further decarbonize Sebastopol's electricity supply.	**Consistent.** The proposed project would include an all-electric design and would utilize renewable electricity through the use of solar panels.

Goal	Project Consistency
Goal BE4: Maximize water conservation and reuse.	**Consistent.** The proposed project would include ultra-low flow water fixtures, low impact landscaping, and onsite stormwater capture.
Goal CW1: Reach Zero Waste by 2030 by minimizing solid waste production, increasing recycling, composting, and food recovery, and supporting community sharing, mending, and reuse.	**Consistent.** The proposed project would be consistent with the AB 341 waste diversion goal of 75 percent and would be required to recycle organic wastes pursuant to SB 1383.
Source: City of Sebastopol 2022	

Project Consistency with the City's General Plan

Table 4.6-3 shows the proposed project's consistency with the City's General Plan Circulation Element and Conservation and Open Space Element.

Table 4.6-3 Project Consistency with the City's General Plan

General Plan Policies	Project Consistency
Circulation Element	
Policy CIR 2-14: Provide secure bicycle racks in places such as the Downtown, at commercial areas, park and ride transit facilities, schools, multiple unit residential developments, and other locations where there is a concentration of residents, visitors, students, or employees.	**Consistent.** The proposed project would include 96 bicycle parking spaces and a bicycle repair station to facilitate bicycle transportation.
Policy CIR 3-3: Prioritize high-density and mixed land use patterns that promote transit and pedestrian travel along transit corridors.	**Consistent.** The proposed project would include construction of 80 solar all-electric, three-story townhome-style condominiums, with the potential for up to 16 ADA-accessible ADUs. The proposed project would be located within a half mile of SCT Routes 20, 24, and 26, and would be located in proximity to several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County Trail and existing bicycle lanes along SR 116 between the north city limit and North Main Street, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116. The proposed project would also include a new, enhanced 6-foot-wide pedestrian pathway with public access to connect the West County Trail to Gravenstein Highway, 96 bicycle parking spaces, and a bicycle repair station to promote transit and pedestrian and bicycle travel.
Policy CIR 3-4: Design developments to include features that encourage walking, bicycling, and transit use. Design features shall include bus turnouts, transit shelters and benches, and pedestrian access points between subdivisions and between adjacent related land uses.	**Consistent.** The proposed project would include a new, enhanced 6-foot-wide pedestrian pathway with public access to connect the West County Trail to Gravenstein Highway, 96 bicycle parking spaces, and a bicycle repair station to encourage walking and the use of bicycles.
Policy CIR 5-3: Support the establishment and expansion of a regional network of electric vehicle charging stations and encourage the expanded use of electric vehicles.	**Consistent**. The proposed project would include pre-wiring for EV charging in garages for all 80 units with solar battery backup and include 10 percent of EV charging parking spaces (6 spaces out of 41 spaces) for standard surface parking. As discussed above under Impact GHG-1, the proposed project would be required to comply with Mitigation Measure GHG-1 which would ensure consistency with CALGreen's Tier 2 EV requirements.

General Plan Policies	Project Consistency
Conservation and Open Space Element	
Policy COS 8-5: Encourage public transit, ridesharing and van pooling, shortened and combined motor vehicle trips to work and services, use of bicycles, and walking. Minimize single passenger motor vehicle use.	**Consistent**. The proposed project would include a new, enhanced 6-foot-wide pedestrian pathway with public access to connect the West County Trail to Gravenstein Highway, 96 bicycle parking spaces, and a bicycle repair station to facilitate pedestrian and bicycle transportation and reduce the use of gasoline vehicles. The proposed project would also be located in proximity to several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County- Trail and existing bicycle lanes along SR 116 between the north city limit and North Main Street, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116 which would encourage future residents to bicycle.
Policy COS 9-1: Require all new public and privately constructed buildings to meet and comply with CALGreen Tier 1, or successor program, standards.	**Consistent.** The proposed project would be required to comply with the latest CALGreen standards and Building Energy Efficiency Standards, which would require implementation of energy-efficient light fixtures and building materials into the project design, and would ensure energy efficient performance for new buildings. The proposed project would also comply with CALGreen Tier 2 standards for EV charging spaces with implementation of Mitigation Measure GHG-1.
Policy COS 9-3: Support innovative and green building best management practices including, but not limited to, LEED certification for new development, and encourage project applicants to exceed the most current "green" development standards in the California Code of Regulations (CCR), Title 24, if feasible.	**Consistent.** As discussed in Section 4.16, *Impacts Found to be Less Than Significant*, the proposed project would exceed 2022 Title 24 Building Energy Efficiency Standards by approximately 5 to 10 percent and would include solar which would reduce demand on the electrical grid.
Policy COS 9-5: Promote the use of sustainable and carbon-neutral energy sources in new development.	**Consistent.** The proposed project would include an all-electric design and would utilize renewable electricity through the use of solar panels.
Policy COS 9-7: Promote efforts and programs, including increased access to clean technologies such as electric vehicles and charging stations, to encourage residents, businesses, and local organizations to use clean energy sources to supplant dirty technologies.	**Consistent**. The proposed project would include pre-wiring for EV charging in garages for all 80 units with solar battery backup and include 10 percent of EV charging parking spaces (6 spaces out of 41 spaces) for standard surface parking. As discussed above under Impact GHG-1, the proposed project would be required to implement Mitigation Measure GHG-1, which would ensure consistency with CALGreen's Tier 2 EV requirements.
Policy COS 9-9: Promote water conservation among water users.	**Consistent**. The proposed project would include ultra-low flow water fixtures, low impact landscaping, and onsite stormwater capture.
Policy COS 9-10: Continue to require new development to incorporate water efficient fixtures into design and construction.	**Consistent**. The proposed project would include ultra-low flow water fixtures.
Policy COS 9-11: Promote the use of reclaimed water and other non-potable water sources.	**Consistent**. As discussed in Section 4.8, *Hydrology and Water Quality*, runoff from impervious surfaces on site would be detained in detention basins and recharged adjacent to the site. Additionally, runoff from all proposed impervious surfaces would be directed toward the proposed vegetated buffer strips and the existing detention pond that has enough retention capacity to meet the hydromodification requirement of 100 percent volume capture.

General Plan Policies	Project Consistency
Policy COS 9-12: Encourage and support the installation and use of rainwater catchment systems and grey water systems on private land and in public projects.	**Consistent**. As discussed in Section 4.8, *Hydrology and Water Quality*, stormwater runoff from impervious surfaces would be directed toward vegetated buffer strips where runoff would be treated before entering the site storm drain network.
Policy COS 9-13: Continue the citywide recycling program, actively encourage recycling citywide, including the recycling/composting of food waste, and advocate for a regional composting facility.	**Consistent.** The proposed project would be consistent with the AB 341 waste diversion goal of 75 percent and would be required to recycle organic wastes pursuant to SB 1383.

Source: City of Sebastopol 2016

As shown in the tables above, the project would be consistent with applicable GHG goals, policies, and strategies in State and regional plans such as CARB's 2022 Scoping Plan and Plan Bay Area 2050 as well as local plans such as the City of Sebastopol's Climate Action Framework and General Plan. Therefore, the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions and this impact would be less than significant.

Mitigation Measures

No mitigation measures would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

4.6.4 Cumulative Impacts

The impact of GHG emissions generated by the proposed project is inherently cumulative. GHG emissions from one project cannot, on their own, result in changes in climatic conditions; therefore, the emissions from any project must be considered in the context of their contribution to cumulative global emissions, which is the basis for determining a significant cumulative impact. This is determined through the project's consistency with applicable GHG emission thresholds and applicable plans, policies, or regulations adopted for the purpose of reducing the emissions of GHGs. As discussed under Impact GHG-1, with implementation of Mitigation Measure GHG-1, GHG emissions from development facilitated by the project would be consistent with BAAQMD's GHG thresholds for buildings and transportation. In addition, as discussed under Impact GHG-2, the proposed project would be consistent with CARB's 2022 Scoping Plan, Plan Bay Area 2050, the City's Climate Action Framework, and the General Plan. Therefore, the proposed project would not result in a significant cumulative impact related to GHG emissions.

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4.7 Hazards and Hazardous Materials

This section evaluates the potential impacts relating to hazards and hazardous materials impacts associated with implementation of the proposed project.

4.7.1 Environmental Setting

The project site was previously used as agricultural land for apple orchards, and some remnants of apple trees exist on-site. According to the California Department of Toxic Substances Control's (DTSC) online EnviroStor database, the project site is associated with an active Voluntary Agreement cleanup case with regulatory agency oversight by the DTSC (DTSC 2023a).

a. Phase I Environmental Site Assessment – 2018

Stantec Consulting Services Inc. (Stantec) completed a Phase I Environmental Site Assessment (ESA) for the project site on September 12, 2018 (Stantec 2018). The report provided an environmental summary that identified environmental conditions of concern at the project site: former agricultural use of the project site (orchards from at least 1942 to 1993), and former northern adjacent railroad tracks (from at least 1935 to 1980). Based on these findings, Stantec recommended conducting a shallow soil assessment at the subject property (Stantec 2018).

b. Phase II Environmental Site Assessment – 2020

Stantec completed a Phase II ESA for the project site on July 30, 2020, which consisted of three rounds of soil sampling to evaluate potential agricultural and railroad impacts to the project site based on the findings identified in their 2018 Phase I ESA (Stantec 2020). The soil sampling results identified three general areas of the project site with "elevated co-mingled concentrations of arsenic, lead, and organochlorine pesticides (OCPs)" in soil at an approximate depth of 2 feet bgs to less than 5 feet bgs.

Three OCPs (4,4'-dichlorodiphenyltrichloroethane [DDT], 4,4'-dichlorodiphenyldichloroethylene [DDE], and 4,4'-dichlorodiphenyldichloroethylene [DDD]), were reported to be present in soil at the project site at concentrations below their respective screening levels used for residential land use[1], but were above California hazardous waste levels at 11 boring locations (Stantec 2020). The report also indicated that arsenic and lead were detected at concentrations above their respective naturally occurring background concentrations in California soils, the residential screening levels used, and/or California hazardous waste levels at 20 boring locations (Stantec 2020). Stantec recommended engaging with the DTSC to oversee and approve any additional required assessment and remedial action at the project site (Stantec 2020).

c. Supplemental Site Investigation – 2022

Based on DTSC review of the previous assessment reports, which identified data gaps in soil sample data, and at the request of the DTSC, Stantec prepared a Supplemental Site Investigation (SSI) Workplan (Stantec 2022) on behalf of City Ventures. The workplan was approved by the DTSC in September 2022, and Stantec completed the SSI Report in November 2022, which consisted of soil

[1] "More conservative value between the DTSC HERO Note 3 screening levels for residential sites (DTSC 2019) and the USEPA Regional Screening Levels (RSL) for residential sites (USEPA 2019)" (Stantec 2020, Stantec 2022)

sampling in the areas of the project site in which the DTSC requested additional characterization. The sampling results indicated that similar to the 2020 Phase II ESA, 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT were present in soil at concentrations below their respective screening levels used for residential land use, but above California hazardous waste levels at two boring locations within the existing trees' driplines "to remain after redevelopment" (Stantec 2022). The report also indicated that arsenic and lead were detected at concentrations above their respective naturally occurring background concentrations in California soils, the residential screening levels used, and/or California hazardous waste levels at eight boring locations within the existing trees' driplines "to remain after redevelopment" (Stantec 2022). Stantec concluded in their report that in general, the impacted soil within the existing trees' driplines was "limited to the upper 2 feet of soil" (Stantec 2022).

Stantec's SSI report identified 9,520 cubic yards of impacted soil onsite. Therefore, Stantec recommended a combination of excavation and burial of the impacted soil (in the non-protected tree areas) and capping impacted soil present below the protected tree driplines with 6 inches of soil. Burial of the soil would involve DTSC approval, a deed notification and land use covenant, and a clean cap placed over the buried soils "to ensure the placed material is not disturbed in the future by re-development activities" (Stantec 2022).

d. DTSC Standard Voluntary Agreements – 2021 and 2023

In September 2021, the former property owner (SEB, LLC) entered into a DTSC Standard Voluntary Agreement (DTSC 2021). In April 2023, City Ventures Homebuilding, LLC (City Ventures) entered into a similar Voluntary Agreement with DTSC (DTSC 2023b). The agreement incorporated the previous assessment reports and outlined remaining tasks to be completed per DTSC requirements, including a health risk assessment and remedial action documents (DTSC 2023b).

e. Removal Action Workplan and Human Health Risk Assessment – 2023

Stantec prepared a Removal Action Workplan (RAW) for the project site dated May 22, 2023, which stated "the DTSC has determined that the prior assessment reports…have filled any data gaps and that no further investigation activities are required for the [project site] to address elevated levels of pesticides, arsenic, and lead in soil" (Stantec 2023).

The RAW included a Human Health Risk Assessment that Stantec completed for the project site in May 2022, which concluded that "no potential cancer risks or non-cancer hazards were identified" above the criteria used for OCPs, "remediation of lead in soil is not warranted," and a cleanup goal of 11 milligrams per kilogram (mg/kg) was recommended for arsenic at the project site (Stantec 2023).

The cleanup goal recommendation for arsenic was thereby established as a Removal Action Objective for the project site, which was to remove arsenic-impacted soil that exceeds the project site cleanup level (naturally occurring background value of 11 mg/kg) (Stantec 2023). The RAW also included a comparative analysis of three removal action alternatives to achieve the Removal Action Objective – 1) no action, 2) soil excavation/off-site disposal, and 3) soil burial, capping, and deed restriction – in terms of effectiveness, ability to be implemented, and cost. Based on this evaluation, Stantec concluded that Alternative 3 (soil burial, capping, and deed restriction) was the preferred and recommended removal action alternative for the project site (Stantec 2023). The remainder of the RAW outlined the implementation of this removal action.

f. Offsite Hazardous Material Release Case Listings

According to the State Water Resources Control Board's (SWRCB) online GeoTracker database and the DTSC's online EnviroStor database, there is one known release site located within 1,000 feet of the project site as follows (SWRCB 2023a, DTSC 2023a):

- Former Homan Tire Service (840 North Gravenstein Highway): This facility is located approximately 400 feet south of the project site and is associated with one closed LUST case as of 2015. According to case documents available on GeoTracker, soil, soil vapor, and groundwater remediation was conducted at the site. During the most recent groundwater monitoring event in 2015, total petroleum hydrocarbons (TPH) in the gasoline and diesel ranges and VOCs were not detected above the laboratory reporting limits in the nearest groundwater monitoring well to the project site (approximately 450 feet south).

g. Potential Regional Hazards

Additional research was completed to determine if landfills, oil and gas wells, hazardous material pipelines, and per- and polyfluoroalkyl substances (PFAS) investigative sites are located onsite or could be affecting the project site.

Landfills

According to a review of the California Department of Resources, Recycling, and Recovery (CalRecycle) online Solid Waste Information System (SWIS) database, no landfills are located within 2,000 feet of the project site (CalRecycle 2023). The nearest landfill, Sebastopol Burn Dump (390 Morris Street), is located approximately 1 mile east of the project site (CalRecycle 2023). This facility is classified as a closed, solid waste disposal site.

Oil and Gas Wells/Fields

According to a review of California Department of Conservation, Geologic Energy Management Division (CalGEM) online oil and gas well and field records, the project site is not located within an oil/gas field and there are no oil and gas wells located within 1,000 feet of the project site (CalGEM 2023).

Hazardous Material Pipelines

According to a review of the United States Department of Transportation (U.S. DOT), Pipeline Hazardous Materials Safety Administration's online National Pipeline Mapping System database, one hazardous material pipeline is located within 1,000 feet of the project site (U.S. DOT 2023):

- One active natural gas pipeline is located adjacent to the project site along North Gravenstein Highway (Pacific Gas & Electric Company Pipeline ID 9105). In 2018 an incident was reported in association with natural gas pipeline 9105 due to "material/weld/equipment failure." The incident reportedly occurred approximately 850 feet northwest of the project site and has not impacted the project site.

Per- and Polyfluoroalkyl Substances

Beginning in 2019, the SWRCB issued letters to property owners of sites that may be potential sources of PFAS. These sites currently include select landfills, airports, chrome plating facilities, publicly owned treatment works facilities, Department of Defense (DoD) sites, and bulk fuel storage terminals and refineries. The letters included a SWRCB Water Code Section 13267 Order (Investigative Order); an Investigative Order is a directive from the SWRCB to conduct on-site testing of groundwater and/or leachate. This does not mean that PFAS has been produced, used, or discharged at these sites. According to the SWRCB, “PFAS are a large group of human-made substances that do not occur naturally in the environment and are resistant to heat, water, and oil” (SWRCB 2023b).

According to a review of the California PFAS Investigations online map viewer, there are no current landfill, airport, chrome plating, publicly owned treatment works, DoD, or bulk fuel storage terminal/refinery PFAS orders at any facilities listed as located within 1 mile of the project site (SWRCB 2023b).

4.7.2 Regulatory Setting

Hazardous Materials and Waste

The term “hazardous material” is defined in the State of California’s Health and Safety Code (HSC), Chapter 6.95, Section 25501(n)(1) as:

> “[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 that 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 waste is hazardous material generated, intentionally or unintentionally, as a byproduct of some process or condition. Hazardous wastes are defined in California HSC 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 due to factors including, but not limited to, carcinogenicity, acute toxicity, chronic toxicity, bioaccumulative properties, or persistence in the environment, when improperly treated, stored, transported, disposed of, or otherwise managed.”

According to the U.S. Environmental Protection Agency (USEPA), waste may be considered hazardous under the Resource Conservation and Recovery Act (RCRA, the primary Federal hazardous materials law) if it is specifically listed as known hazardous waste or if it meets the one or more of the following characteristics of a hazardous waste:

- **Toxicity.** Poisonous, harmful when ingested or absorbed
- **Ignitability.** Capable of being ignited by open flame, liquids with flash points[2] below 60 degrees Celsius, non-liquids that cause fire through specific conditions, ignitable compressed gases, and oxidizers

[2] Flash point is the lowest temperature at which the vapors of a volatile combustible substance ignite in the air when exposed to flame.

- **Corrosivity.** Capable of corroding other materials, aqueous wastes with a pH of 2 or less or greater than or equal to 12.5
- **Reactivity.** May be unstable under normal conditions, may react with water, may give off toxic gases, or may be capable of detonation or explosion under normal conditions or when heated

Waste which meets certain criteria included in 40 CFR 261.11 (a) (2), including being "fatal to humans in low doses" or having specified lethal dose levels in laboratory rats or rabbits is designated as "acute hazardous waste" under RCRA; Sections 261.31 and 261.33 set out lists of substances currently classified by USEPA as acutely hazardous.

a. Federal Regulations

Primary Federal agencies with responsibility for hazardous materials management include the USEPA, U.S. Department of Labor's Occupational Safety and Health Administration (OSHA), and the U.S. DOT. The major laws enforced by these agencies are described below.

Toxic Substances Control Act (1976) and the Resource Conservation and Recovery Act of 1976 (RCRA)

These acts established a program administered by the USEPA for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the "cradle to grave" system of regulating hazardous wastes. Among other things, the use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Act.

Occupational Safety and Health Act of 1970

OSHA was created to assure safe and healthful working conditions by setting and enforcing standards and by providing training, outreach, education, and assistance. OSHA provides standards for general industry and construction industry on hazardous waste operations and emergency response. The Occupational Safety and Health Act, which is implemented by OSHA, contains provisions with respect to hazardous materials handling. Federal Occupational Safety and Health Act requirements, as set forth in Title 29 of the CFR Section 1910, et. seq., are designed to promote worker safety, worker training, and a worker's right-to-know. OSHA has delegated the authority to administer OSHA regulations to the State of California.

Title 49 of the CFR, which contains the regulations set forth by the HMTA of 1975, specifies additional requirements and regulations with respect to the transport of hazardous materials. Title 49 of the CFR requires that every employee who transports hazardous materials receive training to recognize and identify hazardous materials and become familiar with hazardous materials requirements. Drivers are also required to be trained in function and commodity-specific requirements.

Hazardous Materials Transportation Act of 1975

The transportation of hazardous materials is regulated by the Hazardous Materials Transportation Act (49 CFR Section 101 et seq.), which is administered by the Office of Hazardous Materials Safety within the Pipeline and Hazardous Materials Administration (PHMA) of U.S. DOT. The Hazardous Materials Transportation Act governs the safe transportation of hazardous materials by all modes. The U.S. DOT regulations that govern the transportation of hazardous materials are applicable to any person who transports, ships, or causes to be transported or shipped hazardous materials, or who is involved in any way with the manufacture or testing of hazardous materials packaging or containers. The U.S. DOT regulations govern every aspect of the movement of hazardous materials including packaging, handling, labeling, marking, placarding, operational standards, and highway routing.

Lead-Based Paint Elimination Final Rule 24 Code of Federal Regulations

Governed by the U.S. Housing and Urban Development, regulations for LBP are contained in the Lead-Based Paint Elimination Final Rule 24 Code of Federal Regulations (CFR) 33, which requires sellers and lessors to disclose known LBP and LBP hazards to perspective purchasers and lessees. Additionally, all LBP abatement activities must follow federal occupational safety and health administrations (OSHA). Only LBP-trained and certified abatement personnel can perform abatement activities. All LBP removed from structures must be hauled and disposed of by a transportation company licensed to transport this type of material at a landfill or receiving facility licensed to accept the waste.

Other Hazardous Materials Regulations

In addition to the U.S. DOT regulations for the safe transportation of hazardous materials, there are other applicable federal laws that also address hazardous materials:

- Community Environmental Response Facilitation Act of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Atomic Energy Act
- Federal Insecticide, Fungicide, and Rodenticide Act

b. State Regulations

The California Environmental Protection Agency's (CalEPA) DTSC is the primary state agency governing the storage, transportation, and disposal of hazardous wastes. DTSC is authorized by the USEPA to enforce and implement federal hazardous materials laws and regulations. Regulation of hazardous material use and transport also occurs under a variety of state agencies and authorities, many of whom are partners in the CalEPA-administered Certified Unified Program Agency (CUPA) program discussed below. There are many state statutes and regulations governing hazardous materials and wastes, and they are contained within many different parts of the States' codes, therefore only regulations relevant to this analysis are considered below.

California Hazardous Waste Control Law

The California Hazardous Waste Control Law (HWCL) is the primary hazardous waste statute in the State of California, and implements RCRA as a "cradle-to-grave" waste management system in the State of California for handling hazardous wastes in a manner that protects human health and the environment and would reduce potential resulting impacts. The law exceeds federal requirements by mandating source reduction planning, and a much broader requirement for permitting facilities that treat hazardous waste. It also regulates a number of types of waste and waste management activities that are not covered by federal law.

The hazardous waste management program enforced by DTSC was created by the Hazardous Waste Control Act (HSC Section 25100 et seq.), which is implemented by regulations described in California Code of Regulations (CCR) Title 26. The State program is similar to, but more stringent than, the federal program under RCRA. The regulations list materials that may be hazardous, and establish criteria for their identification, packaging, and disposal. Environmental health standards for management of hazardous waste are contained in CCR Title 22, Division 4.5.

Government Code Section 65962.5 requires CalEPA, via the DTSC, the State Department of Health Services, the SWRCB, and the California Department of Resources, Recycling, and Recovery (CalRecycle) to compile and annually update lists of hazardous waste sites and land designated as hazardous waste sites throughout the state (collectively known as the Cortese List). The Secretary for Environmental Protection consolidates the information submitted by these agencies and distributes it to each city and county where sites on the lists are located. Before the lead agency accepts an application for any development project as complete, the applicant must consult these lists to determine if the site at issue is included.

If any soil is excavated from a site containing hazardous materials, it would be considered a hazardous waste if it exceeded specific criteria in CCR Title 22. Remediation of hazardous wastes found at a site may be required if excavation of these materials is performed, or if certain other soil disturbing activities would occur. Even if soil or groundwater at a contaminated site does not have the characteristics required to be defined as hazardous waste, remediation of the site may be required by regulatory agencies subject to jurisdictional authority. Cleanup requirements are determined on a case-by-case basis by the agency taking jurisdiction.

California Health and Safety Code

HSC Section 25150 requires DTSC to adopt, and revise when appropriate, standards and regulations for the management of hazardous wastes to protect against hazards to the public health, domestic livestock, wildlife, or the environment. In adopting or revising standards and regulations pursuant to this chapter, the department shall, insofar as practicable, make the standards and regulations conform with corresponding regulations adopted by the USEPA pursuant to the federal act. This section does not prohibit the department from adopting standards and regulations that are more stringent or more extensive than federal regulations.

CalEPA, in cooperation with the DTSC and the SWRCB and the Office of Environmental Health Hazard Assessment, publishes a list of screening numbers for select contaminants. Screening numbers are defined as the concentration of a contaminant published by CalEPA as an advisory number. In determining screening numbers, CalEPA considers the toxicology of the contaminant, risk assessments prepared by federal or state agencies, epidemiological studies, risk assessments or other evaluations of the contaminant during remediation of a site, and screening numbers that have been published by other agencies.

In January 2018, the DTSC's Human and Ecological Risk Office (HERO) issued Human Health Risk Assessment Note Number 3. The document lists DTSC-modified screening levels (DTSC-SL) for select compounds in soil, tap water, and air for use in the human health risk assessment process at hazardous waste sites and permitted facilities, and the DTSC-SLs were last updated in 2022.

Certified Unified Program Agency

In accordance with Chapter 6.11 of HSC Section 25404, et seq., local regulatory agencies enforce six environmental and emergency response programs through the CUPA program, as listed below:

- Hazardous Materials Release Response Plans and Inventories (Business Plans)
- California Accidental Release Prevention (CalARP) Program
- Underground Storage Tank (UST) Program
- Aboveground Petroleum Storage Tank Program (AST)
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (tiered permitting) Programs
- California Uniform Fire Code: Hazardous Material Management Plans and Hazardous Material Inventory Statements

The state agency partners involved in the Unified Program have the responsibility of setting program element standards, working with CalEPA on ensuring program consistency, and providing technical assistance to the CUPA. The following state agencies are involved with the Unified Program:

- CalEPA is directly responsible for coordinating the administration of the Unified Program. The Secretary of the CalEPA certifies CUPAs.
- DTSC provides technical assistance and evaluation for the hazardous waste generator program including onsite treatment (tiered permitting).
- The Office of Emergency Services is responsible for providing technical assistance and evaluation of the Hazardous Material Release Response Plan (Business Plan) Program and the CalARP Programs.
- The Office of the State Fire Marshal is responsible for ensuring the implementation of the Hazardous Material Management Plans and the Hazardous Material Inventory Statement Programs. These programs tie in closely with the Business Plan Program.
- The SWRCB provides technical assistance and evaluation for the UST program in addition to handling the oversight and enforcement for the AST program.

The City of Healdsburg is the CUPA for the City of Healdsburg and the City of Sebastopol, and is responsible for implementing the federal and state laws and regulations pertaining to the handling of hazardous wastes and hazardous materials.

California Code of Regulations Title 8 (Workplace Safety Regulations)

The California Division of Occupational Safety and Health (CalOSHA) assumes primary responsibility for developing and enforcing workplace safety regulations. These regulations concern the use of hazardous materials in the workplace, including requirements for employee safety training; availability of safety equipment; accident and illness prevention programs; hazardous-substance exposure warnings; and preparation of emergency action and fire prevention plans.

CalOSHA also enforces hazard communication program regulations, including procedures for identifying and labeling hazardous substances, and requires that safety data sheets (formerly known as material safety data sheets) be available for employee information and training programs. CalOSHA standards are generally more stringent than federal regulations. Construction workers and operational employees within the plan area would be subject to these requirements.

CCR Title 8, Section 1529 authorizes CalOSHA to implement the survey requirements of CFR Title 29 relating to asbestos. These federal and state regulations require facilities to take all necessary precautions to protect employees and the public from exposure to asbestos. Workers who conduct asbestos abatement must be trained in accordance with federal and State OSHA requirements. The Bay Area Air Quality Management District (BAAQMD) oversees the removal of regulated asbestos-containing materials (ACM) in the San Francisco Bay Area.

CCR Title 8, Section 1532.1 includes requirements to manage and control exposure to LBP. These regulations cover the demolition, removal, cleanup, transportation, storage, and disposal of lead-containing material. The regulations outline the permissible exposure limit, protective measures, monitoring, and compliance to ensure the safety of construction workers exposed to lead-based material. Loose and peeling LBP must be disposed of as a State and/or federal hazardous waste if the concentration of lead equals or exceeds applicable hazardous waste thresholds. Federal and State OSHA regulations require a supervisor who is certified with respect to identifying existing and predictable lead hazards to oversee air monitoring and other protective measures during demolition activities in areas where LBP may be present. Special protective measures and notification of CalOSHA are required for highly hazardous construction tasks related to lead, such as manual demolition, abrasive blasting, welding, cutting, or torch burning of structures, where LBP is present.

California Code of Regulations Title 22 (Environmental Health Standards for the Management of Hazardous Waste)

CCR Title 22, Division 4.5 contains the Environmental Health Standards for the Management of Hazardous Waste, which includes California waste identification and classification regulations. The HWCL, under CCR Title 22, establishes regulations that are similar to RCRA but more stringent in their application and empowers the DTSC to administer the State's hazardous waste program and implement the federal program in California.

California Fire Code

The California Fire Code is Part 9 of CCR Title 24. It is the primary means for authorizing and enforcing procedures and mechanisms to ensure the safe handling and storage of any substance that may pose a threat to public health and safety. The California Fire Code regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. The California Fire Code and the California Building Code use a hazard classification system to determine what protective measures are required to protect fire and life safety. These measures may include construction standards, separations from property lines and specialized equipment. To ensure that these safety measures are met, the California Fire Code employs a permit system based on hazard classification.

California Public Resources Code 21151.4

Pursuant to Public Resources Code Section 21151.4, projects that can be reasonably anticipated to produce hazardous air emissions or handle extremely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school must consult with the potentially affected school district and provide written notification not less than 30 days prior to the proposed certification or adoption of an environmental document. Where a school district proposes property acquisition or the construction of a school, the environmental document must address existing environmental hazards, and written findings must be prepared regarding existing pollutant sources.

California Multi-Hazard Mitigation Plan

The California Office of Emergency Services (CalOES) prepares the State of California Multi-Hazard Mitigation Plan (SHMP). The SHMP identifies hazard risks and includes a vulnerability analysis and a hazard mitigation strategy. The SHMP is federally required under the Federal Disaster Mitigation Act of 2000 for the State to receive Federal funding. The Federal Disaster Mitigation Act of 2000 requires a State mitigation plan as a condition of disaster assistance.

California Emergency Plan

The foundation of California's emergency planning and response is a Statewide mutual aid system, which is designed to ensure that adequate resources, facilities, and other support is provided to jurisdictions whenever their own resources prove to be inadequate to cope with a given situation.

The California Disaster and Civil Defense Master Mutual Aid Agreement (California Government Code Sections 8555–8561) requires signatories to the agreement to prepare operational plans to use within their jurisdiction, and outside their area. These plans include fire and non-fire emergencies related to natural, technological, and war contingencies. The State of California, all State agencies, all political subdivisions, and all fire districts signed this agreement in 1950.

Section 8568 of the California Government Code, the "California Emergency Services Act," states that "the State Emergency Plan shall be in effect in each political subdivision of the State, and the governing body of each political subdivision shall take such action as may be necessary to carry out the provisions thereof." The California Emergency Services Act provides the basic authorities for conducting emergency operations following the proclamations of emergencies by the Governor or appropriate local authority, such as a City Manager. The provisions of the California Emergency Services Act are reflected and expanded on by appropriate local emergency ordinances. The California Emergency Services Act further describes the function and operations of government at all levels during extraordinary emergencies, including war.

All local emergency plans are extensions of the State of California Emergency Plan. The State Emergency Plan conforms to the requirements of California's Standardized Emergency Management System (SEMS), which is the system required by Government Code 8607(a) for managing emergencies involving multiple jurisdictions and agencies. The SEMS incorporates the functions and principles of the Incident Command System (ICS), the Master Mutual Aid Agreement, existing mutual aid systems, the operational area concept, and multi-agency or inter-agency coordination. Local governments must use SEMS to be eligible for funding of their response-related personnel costs under State disaster assistance programs. The SEMS consists of five organizational levels that are activated as necessary, including: field response, local government, operational area, regional, and State. CalOES divides the State into several mutual aid regions. Contra Costa County is located in Mutual Aid Region II, which includes Del Norte, Humboldt, Mendocino, Sonoma, Lake, Napa, Marin, Solano, Contra Costa, San Francisco, San Mateo, Alameda, Santa Clara, Santa Cruz, San Benito, and Monterey Counties.[3]

[3] CalOES. 2022. Coastal Region Operational Area Assignments. March 2022. Available: https://www.caloes.ca.gov/RegionalOperationsSite/Documents/EMA_ESC_OA_Assignments_Coastal.pdf (accessed April 2023)

c. Regional and Local Regulations

Administration and enforcement of the major environmental programs were transferred to local agencies as CUPAs beginning in 1996. The purpose of this was to simplify environmental reporting by reducing the number of regulatory agency contacts a facility must maintain and requiring the use of more standardized forms and reports.

North Coast Regional Water Quality Control Board

The nine Regional Water Quality Control Boards (RWQCB) are authorized by the SWRCB to enforce provisions of the Porter-Cologne Water Quality Control Act of 1969. This Act gives the RWQCBs authority to require groundwater investigations when the quality of groundwater or surface waters of the State is threatened and to require remediation of a site, if necessary. Both of these agencies are part of the CalEPA. In the City of Sebastopol, the CUPA handles most leaking underground storage tank cases, so the North Coast RWQCB may oversee cases involving other groundwater contaminants; i.e., Cleanup Program cases. In the case of hazardous material releases at a project site, the responsible party would notify the CUPA, RWQCB, or DTSC and a lead would be determined.

Bay Area Air Quality Management District Regulation 11, Rule 2

The BAAQMD regulates demolition and renovation operations involving ACM in the Bay Area through Rule 2, which applies to any planned renovation that involves 100 square feet, 100 linear feet, or 35 cubic feet or more of ACM, as well as to all demolitions regardless of ACM content. The requirements include a noticing period, the conducting of a pre-demolition survey for ACM materials by a certified inspector, and a general prohibition on demolition until ACM has been abated and removed from the location and requires that abatement be conducted by persons with specific asbestos certifications (primarily Asbestos Hazard Emergency Response Act [AHERA] certification).

Association of Bay Area Governments Hazard Mitigation Plan

The Association of Bay Area Governments' Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area was updated in 2010 in partnership with Bay Conservation and Development Commission Adapting to Rising Tides Program to support local governments in the regional plan for existing and future hazards of climate change. This detailed 5-year plan identifies potential natural and human-made hazards, assesses their potential risks, and includes mitigation methods to reduce risks. The potential hazards identified in the Plan include earthquakes and liquefaction, wildfires, floods, drought, solar storms, dam or levee failure, disease outbreak, freezes, wind, heat, thunder and lightning storms, siltation, tornadoes, hazardous materials, slope failure and mudflows, and other hazards. Similarly, Plan mitigation measures include hazard event planning, emergency preparedness coordination, education, facility upgrades, and monitoring actions. The Association of Bay Area Governments is currently in the process of updating the plan and released a draft of the 2021 Multi-Jurisdictional Hazard Mitigation Draft Plan in March 2021 but has not been formally adopted at the time of this report.

Sonoma County Operational Area Hazard Mitigation Plan

The Sonoma County Operational Area Hazard Mitigation Plan assesses the County's vulnerabilities to various hazards and presents mitigation strategy, including goals, objectives, and actions that the

County will strive to implement over the next five years. These mitigation actions are intended to reduce the disruption or loss of life, property, and economy that might result from a natural disaster. The hazard and risk assessment focuses on earthquake, flood, wildland fire, and landslide hazards, as these are considered to constitute the greatest risk to the County based on past disaster events, future probabilities, and degree of vulnerability. The 2021 update to this plan includes a multi-jurisdictional scope versus previous versions which were single-jurisdictional and only focused on the county. The 2021 plan includes updates such as repetitive loss areas, climate change implications on hazards trends, and mitigation best practices (County of Sonoma 2021).

City of Sebastopol Local Hazard Mitigation Plan

The City adopted a Local Hazard Mitigation Plan on June 7, 2022. This plan documents the City of Sebastopol's hazard mitigation planning process and identifies relevant hazards and vulnerabilities and strategies the City will use to decrease vulnerability and increase resiliency and sustainability in Sebastopol.

City of Sebastopol General Plan

The City's 2016-2035 General Plan (City of Sebastopol 2016b) contains goals and policies related to hazards and hazardous materials. The following policies are relevant to the project.

Goal SA 6: Reduce Hazards Associated with the Transportation, Use, Storage, and Disposal of Hazardous Wastes and Hazardous Materials

Policy SA 6-1: Require measures to protect the public health from the hazards associated with the transportation, storage and disposal of hazardous wastes (TSD Facilities).

Policy SA 6-2: Use the environmental review process to comment on Hazardous Waste Transportation, Storage and Disposal (TSD) Facilities proposed in the Sebastopol Planning Area and throughout the County to request a risk assessment and ensure that potentially significant, widespread, and long term impacts on public health and safety of these facilities are identified and mitigated, as such impacts do not respect jurisdictional boundaries.

Policy SA 6-3: Strictly regulate the storage of hazardous materials

Policy SA 6-4: Develop, in cooperation with the County, Caltrans, and neighboring cities, regulations prohibiting through-transport by truck of hazardous materials through Downtown and identify alternate routes for the transport hazardous materials.

Policy SA 6-5: Continue to maintain Sebastopol as a Voluntary Toxics-Free Zone, as defined by City Resolution 5108.

City of Sebastopol Municipal Code

Title 8 of the Sebastopol Municipal Code (SMC) provides requirements for the health and safety of the city. Specifically, SMC Chapter 8.30 regulates the underground storage of hazardous substances and SMC Chapter 8.32 outlines the requirements for hazardous materials release response plans and inventory.

Environmental impacts related to hazards and hazardous materials and wildfire have been assessed using impact significance criteria from federal, State, and local regulations. The impact analysis is based on available literature regarding the existing plans, policies, and resources in the General Plan area. Criteria used during this analysis are described below.

4.7.3 Impact Analysis

a. Significance Thresholds and Methodology

Based on Appendix G of the CEQA Guidelines, a hazards and hazardous materials impact is considered significant if:

1. Routine transport, use, and/or dispose of hazardous materials in a manner that would create a significant hazard to the public or the environment.
2. Regular transport of hazardous materials to/from the plan areas on an unsuitable road or use of highly volatile hazardous materials, which would create a significant hazard to the public or the environment.
3. Location of new development within 0.25 mile of an existing or proposed school in conjunction with hazardous emissions or handle hazardous materials, waste, or substances.
4. Location of the project on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.
5. Location of new development within an airport land use plan or within two miles of a public airport and reduction of safety of people working or residing in the plan areas.
6. Impairing implementation of or interfering with an adopted emergency response plan or emergency evacuation plan via blockage of an evacuation route or provision of only one access point for emergency vehicles.

b. Project Impacts and Mitigation Measures

Threshold 1:	Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?
Threshold 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?

Impact HAZ-1 THE PROPOSED PROJECT WOULD INCLUDE CONSTRUCTION AND OPERATION WHICH COULD INVOLVE THE USE, STORAGE, DISPOSAL OR TRANSPORTATION OF HAZARDOUS MATERIALS. HOWEVER, COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS WOULD REDUCE POTENTIAL IMPACTS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Transport and use of hazardous materials for the proposed project could occur during the construction and operation of the proposed project. This section addresses impacts from aboveground hazardous material generation, handling, use, and transport; impacts from potential contaminated soil and soil vapor are discussed under Impact HAZ-3.

Construction Impacts

Construction associated with the proposed project may include the temporary transport, storage, and use of potentially hazardous materials including fuels, lubricating fluids, cleaners, or solvents. If the proposed project involves the removal of contaminated soil, grading or excavation, then the project would also result in the transport and disposal of hazardous materials as they are unearthed and removed from the project site. Potential impacts with respect to public and environmental exposure to soil, soil vapor, and groundwater contaminants are discussed further under Impact HAZ-3. Hazardous material transport may occur regularly throughout construction, as materials are brought to and from the project site. Any use and transport of hazardous materials, such as solvents or construction fuels, would comply with all local, State, and federal regulations regarding the handling of potentially hazardous materials, as discussed under the *Regulatory Setting*, above. Hazardous materials would be transported by DTSC-registered transporters and be required to follow all U.S. DOT regulations under the Hazardous Materials Transport Act, in addition to CalEPA and local CUPA regulations regarding hazardous materials transport. In addition, construction activities that transport hazardous materials would be required to transport such materials along designated roadways in the city and county. Materials transported to and from the project site would be required to reach the closest designated transport route by the shortest path; US Highway 101, State Route 116 and State Route 12 are the closest designated routes. Therefore, transporters would spend a limited time in the local area, primarily on major transit thoroughfares and virtually no time in residential streets, limiting risk of upset near sensitive uses such as residences.

The requirements for licensed transportation of any hazardous materials along designated routes would minimize any risks from use, storage, or transport of hazardous materials during construction, ensuring that the proposed project would not present a significant risk to the public or the environment, and impacts would be less than significant.

Operation Impacts

Although new residential development at the project site could involve the use, storage, disposal, or transportation of minute quantities of hazardous materials, new residential uses would not be expected to involve large quantities of these materials. Normal residential activities do not generally present a significant threat to the public or the environment through the use, storage, disposal, or transportation of significant quantities of hazardous materials. Some materials considered hazardous may be used or stored on the project site, but these materials would be limited primarily to common household solvents, paints, chemicals used for cleaning and building maintenance, and landscaping supplies and would not be substantially different from household chemicals and solvents already in general and wide use throughout any residential area. Residents are anticipated to use limited quantities of products routinely for periodic cleaning, repair, and maintenance or for landscape maintenance/pest control that could contain hazardous materials. Those using such products would be required to comply with all applicable regulations regarding the disposal of household waste. Therefore, exposure of the public or environment to the routine use or accidental release of hazardous materials from operation of the proposed townhome development would be less than significant.

Mitigation Measures

Impacts would be less than significant with required adherence to existing regulations; no mitigation measures would be required.

Threshold 3:	Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?

Impact HAZ-2 SEBASTOPOL INDEPENDENT CHARTER SCHOOL IS LOCATED WITHIN 0.25 MILE OF THE PROPOSED PROJECT. THE PROPOSED PROJECT WOULD NOT EMIT OR HANDLE HAZARDOUS OR ACUTELY HAZARDOUS MATERIALS. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

The proposed project is located within 0.25 mile of one school: Sebastopol Independent Charter School, located adjacent to the north of the project site across a recreational trail. There are no other schools within 0.25 mile of the proposed site. Children are particularly susceptible to long-term effects from exposure to hazardous materials. Locations where children spend extended periods of time, such as schools, are considered sensitive to hazardous air emissions and accidental release associated with the handling of extremely hazardous materials, substances, or wastes.

As detailed under Impact HAZ-1, above, construction of the proposed project may involve the use of hazardous materials, including handling of soil or transport of hazardous wastes and materials. Operation of the proposed residential development would not be reasonably expected to generate hazardous materials or waste, other than minor quantities typically used for cleaning or landscaping maintenance. Dust control to limit exposure of construction workers and public is included in Mitigation Measure 3b below.

As detailed under Impact HAZ-1, construction could involve both the use and transport of both hazardous materials and hazardous wastes and would be required to be managed by BMPs prescribed in the project RAW (discussed under Impact HAZ-3); in addition, the use of common construction hazardous materials and wastes in quantities needed for a residential development of this size would not be expected to present hazards to the school. The use of such materials would present a potential impact were they to be transported near the elementary school; however, as discussed under Impact HAZ-1 above, licensed hazardous materials transporters leaving the project site would take the shortest direct route. Therefore, it is unlikely transporters would be required to drive past the school while carrying hazardous materials. Therefore, impacts related to construction hazardous materials to the school would be less than significant.

Mitigation Measures

Mitigation Measure 3b below would be applicable.

Significance After Mitigation

Mitigation Measure 3b would ensure that dust control measures in the project RAW are implemented through the soil management plan.

Threshold 4:	Would the project be located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Impact HAZ-3 THE PROJECT SITE IS ASSOCIATED WITH AN OPEN VOLUNTARY AGREEMENT CLEANUP CASE AND IS THEREFORE INCLUDED ON A LIST OF HAZARDOUS MATERIALS SITES COMPILED PURSUANT TO SECTION 65962.5. THERE ARE KNOWN HAZARDOUS MATERIAL IMPACTS TO SOIL AT THE PROJECT SITE. HOWEVER, COMPLIANCE WITH APPLICABLE REGULATIONS AND MITIGATION FOR POTENTIAL SOIL AND/OR GROUNDWATER IMPACTS AT THE PROJECT SITE WOULD MINIMIZE HAZARDS FROM THE PROPOSED PROJECT. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED.

As detailed under *Environmental Setting,* the project site is associated with an active Voluntary Agreement cleanup case with regulatory agency oversight by the DTSC (DTSC 2023a). Therefore, the project site is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5.

Based on the results of soil investigations conducted at the project site, there is known OCP-, arsenic-, and lead-impacted soil present at the project site at concentrations exceeding the applicable regulatory screening levels for residential land use (DTSC-SLs and USEPA RSLs) and/or California hazardous waste levels. Additionally, the soil investigations conducted along the former northern adjacent railroad tracks did not include analysis for railroad-related contaminants of concern such as TPH (full range), VOCs, semi-volatile organic compounds (SVOCs), herbicides, or polycyclic aromatic hydrocarbons (PAHs). Therefore, unknown soil conditions exist along the northern boundary of the project site.

Construction Impacts

Groundwater at the project site has been measured at 28.5 feet bgs and has not been investigated for hazardous chemical impacts; therefore, groundwater conditions at the project site are unknown. However, based on the relatively shallow depth of known soil impacts (less than 5 feet bgs) and planned depth of excavation for the proposed project (less than 10 feet bgs), groundwater is not expected to be encountered during construction activities at the project site. Additionally, impacted soil would be buried at six feet below ground surface, or hauled off-site for disposal.

With the unknown and known impacted soil at the project site, there is a potential for grading and construction workers to be exposed to contaminants (e.g., TPH, VOCs, SVOCs, PAHs, herbicides, OCPs, and metals) via dust and/or soil. Additionally, if offsite disposal of soils from the project site would occur during project construction, the soil may require special handling or disposal as a waste.

The existing conditions at this known release site would result in a potentially significant hazard to the public (construction workers on-site) or the environment during grading and construction at the project site. Therefore, construction impacts would be potentially significant.

Operation Impacts

The risk of hazardous materials creating a significant hazard to the public or the environment would primarily occur during construction of the project as on-site contamination is disturbed. Once the project is operational, the contaminated media would mostly be removed or covered and would no longer pose a risk. Therefore, operation impacts would be less than significant.

Mitigation Measures

HAZ-3a DTSC Regulatory Agency Submittal

The DTSC shall continue to be utilized for agency oversight of assessment and remediation of the project site through completion of construction activities. Prior to commencement of construction and grading activities at the project site, the project applicant shall submit the following documents to the DTSC project manager of the open Voluntary Agreement cleanup case:

- Current development plan and any modifications to the development plan
- All environmental documents completed for the project, including this Initial Study document
- All future environmental documents completed for the project

Upon submittal of the information above, and in accordance with the 2023 DTSC Standard Voluntary Agreement, DTSC may require actions such as: development of subsurface investigation workplans; completion of soil, soil vapor, and/or groundwater subsurface investigations; installation of soil vapor or groundwater monitoring wells; soil excavation and offsite disposal; completion of human health risk assessments; and/or completion of remediation reports or case closure documents. Subsurface soil, soil vapor, and groundwater investigations, if required, shall be conducted in accordance with a sampling plan that shall be reviewed and approved by the DTSC.

The DTSC approval documents shall be submitted to and reviewed by the City prior to issuing grading permits.[4]

HAZ-3b Soil Management Plan

Prior to commencement of construction and grading activities at the project site, the project applicant shall retain a qualified consultant (Professional Geologist [PG] or Professional Engineer [PE]) to prepare a Soil Management Plan (SMP) for the project site. The SMP shall address:

1. On-site handling and management of impacted soils or other impacted wastes (e.g., stained soil, and soil or groundwater with solvent or chemical odors) if such soils or impacted wastes are encountered, and
2. Specific actions to reduce hazards to construction workers and offsite receptors during the construction phase.

The SMP must establish remedial measures and soil management practices to ensure construction worker safety, the health of future workers and residents, and prevent the off-site migration of contaminants from the project site. These measures and practices may include, but are not limited to:

- Stockpile management, including stormwater pollution prevention and the installation of BMPs
- Proper disposal procedures for contaminated materials
- Investigation procedures for encountering known and unexpected odorous or visually stained soils, other indications of hydrocarbon piping or equipment, and/or debris during ground-disturbing activities

[4] The DTSC may determine that the North Coast RWQCB or the City of Healdsburg (the CUPA for the City) may be best suited to perform the cleanup oversight agency duties for the assessment and/or remediation of the project. Should the cleanup oversight agency be transferred from the DTSC to the North Coast RWQCB or the CUPA, this and other mitigation measures shall still apply.

- Monitoring and reporting
- A health and safety plan for contractors working at the project site that addresses the safety and health hazards of each phase of project site construction activities with the requirements and procedures for employee protection
- The health and safety plan shall outline proper soil handling procedures and health and safety requirements to minimize worker and public exposure to hazardous materials during construction.

The DTSC shall review and approve the SMP prior to construction (grading) activities at the project site. The City shall review and approve the DTSC-approved SMP prior to issuing grading permits. The project applicant shall implement the SMP during , grading and construction at the project site.

Significance After Mitigation

Implementation of Mitigation Measures HAZ-3a and HAZ-3b during grading and construction and operation of the project would reduce potential hazardous material impacts at the project site below applicable thresholds of significance by implementing proper management of hazardous materials and wastes, proper transportation of impacted materials, and/or site management practices. These practices would increase construction worker safety, the health of future workers and residents, and remediation of hazardous soils.

Threshold 5:	For a project located within 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 result in a safety hazard or excessive noise for people residing or working in the project area?

Impact HAZ-4 THE PROJECT SITE IS NOT LOCATED IN AN AIRPORT LAND USE PLAN OR IN THE VICINITY OF A PRIVATE AIRSTRIP. NO IMPACTS RELATED TO AIRPORTS WOULD OCCUR.

The nearest airport to the project site is the Sonoma County Airport, located approximately 7 miles northeast. The project site is not located in or near an airport land use plan or in the vicinity of a private airstrip. Therefore, the project would not result in a safety hazard for people residing or working in the area because there are no airports near or within the city. There would be no impact.

Mitigation Measures

No mitigation measures would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 6:	Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Impact HAZ-5 THE PROJECT WOULD NOT IMPAIR IMPLEMENTATION OF OR PHYSICALLY INTERFERE WITH AN ADOPTED EMERGENCY RESPONSE PLAN OR EMERGENCY EVACUATION PLAN. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

As required by State law, the City of Sebastopol has established emergency preparedness procedures and programs to be prepared for and respond to a variety of natural and manmade disasters that could affect the community. The City adopted a Local Hazard Mitigation Plan on June 7, 2022, which includes preparation of an Emergency Operation Plan. The City's Emergency Operation Plan helps maintain the City's ability to prepare, respond and recover from a variety of emergency incidents. During emergencies, the County of Sonoma and incorporated cities have established standardized evacuation zones. The project site is located in Evacuation Zone SEB-001, where the primary evacuation and emergency access routes in the vicinity of the project site would be State Route 116 and State Route 12, which connects to US Highway 101. The proposed project would not conflict with the Emergency Operations Plan and would not impair evacuation. For example, the proposed project does not envision closing major evacuation routes, such as State Route 116.

The proposed project does not include any characteristics (e.g., permanent road closures) that would physically impair or otherwise interfere with access to these critical routes or obstruct emergency response or evacuation in the project vicinity. As described in Section 4.13, *Transportation,* the project itself would not impair emergency access to structures in the immediate vicinity. In addition, standard traffic management practices related to construction staging and parking would ensure that temporary road closures during construction would not impair or interfere with emergency response or evacuation. Furthermore, industry practices require the notification of area emergency responders prior to any such closures, ensuring that in the event of an emergency, responders and managers would already be aware of any potential obstacles related to project construction. Accordingly, potential impacts related to interference with an adopted emergency response plan or emergency evacuation plan would be less than significant.

Mitigation Measures

No mitigation measures would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation measures.

Threshold 7:	Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

Impact HAZ-6 THE PROJECT SITE IS IN AN URBAN AREA AND IS NOT NEAR WILDLANDS. NO IMPACT RELATED TO WILDLAND FIRES WOULD OCCUR.

As detailed in Section 4.16, *Effects Found not to be Significant*, the project site is not located within a Fire Hazard Severity Zone or within the Wildland-Urban Interface. The proposed project would not expose people or structures directly or indirectly to risk related to wildland fires. No impact would occur.

Mitigation Measures

No mitigation measures would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation measures.

4.7.4 Cumulative Impacts

Generally, hazards and hazardous materials impacts associated with individual developments are site specific in nature and must be addressed on a case-by-case basis. As such, the geographic scope for hazardous materials impacts is the project site and immediately surrounding parcels. Since hazards and hazardous materials are required to be examined as part of the permit application and environmental review process, potential impacts associated with individual projects will be adequately addressed prior to permit approval. Therefore, cumulative impacts related to hazardous materials would be less than significant.

The proposed project could result in potentially significant impacts because hazardous materials could be disturbed and released during grading and construction activities. However, with adherence to existing regulatory standards for hazardous materials, as well as Mitigation Measure HAZ-3a and HAZ-3b, project-specific impacts would be less than significant with mitigation. As such, the project would not result in a cumulatively considerable contribution to a significant cumulative impact related to hazards and hazardous materials.

The proposed project could result in potentially significant impacts related to disturbance of hazardous materials within 0.25 mile of a school. However, as discussed under Impact HAZ-1 above, licensed hazardous materials transporters leaving the project site would take the shortest direct route. As such, the project would not result in a cumulatively considerable contribution to a significant cumulative impact related to construction hazardous materials near a school.

The proposed project is not within an airport land use plan or within two miles of a public airport. Therefore, cumulative impacts related to the safety of people working or residing in the project site and airport land use plan area would be less than significant.

The geographic scope for cumulative wildland fire hazard impacts is inclusive of projects within the City. As shown in Table 3-1 in Section 3.0, *Environmental Setting*, several projects are located with 2.8 miles of the project site and are comprised of residential, commercial, medical, and mixed-use developments. None of the cumulative projects fall within a FHSZ (CAL FIRE 2022). Therefore, cumulative wildland fire hazard impacts would be less than significant. The project site is not adjacent to any wildland areas and is surrounded by existing development or rural agricultural lands; large tracts of wildland fuels, such as forest or brushland, do not occur on or near the project site. As such, the project would not result in a cumulatively considerable contribution to a significant cumulative impact related to wildland fire hazards.

4.8 Hydrology and Water Quality

This section presents the existing conditions, summarizes the regulatory and planning framework, and analyzes the impacts to the surface water and groundwater resources in Sonoma County, relative to the proposed project. Impacts to water supply and wastewater treatment are discussed in Section 4.15, *Utilities and Service Systems*. Extensive overlap exists in regulatory programs governing environmental aspects of water quality, drinking water quality, and the public health aspects of water supply protection. The analysis that follows relies in part on the Preliminary Drainage Analysis and Preliminary Storm Water Low Impact Development Submittal prepared for the project by Adobe Associates, Inc. in January 2023 (Appendix H).

4.8.1 Environmental Setting

Hydrologic Setting

The project site is approximately 192 feet above mean sea level (amsl) with uneven terrain. Existing slopes on the project site generally vary from 2% to 15%. Current runoff within the parcel on the southeastern portion of the site sheet flows to the northwest and there is a high point on the northwestern portion of the site where runoff sheet flows to the north, west, and south (Adobe Associates, 2023a). Based on the topography, surface water on the project site infiltrates the ground surface or flows into the gutter system along Gravenstein Highway.

The project site overlies the Santa Rosa Valley Groundwater Basin and the Santa Rosa Plain Subbasin (SGMA 2018). The Santa Rosa Plain Subbasin is one of three coastal alluvial subbasins of the Santa Rosa Valley Groundwater Basin (Santa Rosa Plain Groundwater Sustainability Agency 2023). According to a groundwater monitoring report for Superior Cleaners located at 735 Gravenstein Highway North, which is approximately 1,200 feet to the south, depth to groundwater was reported between 21.36 and 32.34 feet below ground surface (bgs) with a groundwater flow towards the northeast in 2009 (Stantec, 2022). A groundwater boring on the project site in 2020 determined the depth to groundwater as 28.5 feet bgs (Stantec 2022).

Surface Water

The nearest surface water to the project site is Laguna de Santa Rosa Creek, located approximately one mile east of the project site. The project site is located within the North Coast Hydrologic Region. The North Coast hydrologic region covers approximately 19,500 square miles and includes all or portions of Modoc, Siskiyou, Del Norte, Trinity, Humboldt, Mendocino, Lake, and Sonoma counties, and small areas of Shasta, Tehama, Glenn, Colusa, and Marin counties (California Department of Water Resources 2023). The City of Sebastopol is in the Russian River Watershed which is a region of nearly 1,500 square miles of forests, agricultural lands and urban lands in Mendocino and Sonoma Counties (Russian River Watershed Association 2023).

Groundwater

The City of Sebastopol relies exclusively on groundwater as a water supply source and is located within the Santa Rosa Valley Groundwater Basin. The Santa Rosa Plain Groundwater Basin is one of the largest groundwater basins in the California Department of Water Resource’s North Coast Hydrologic Region. The Santa Rosa Plain Groundwater Basin has three sub-basins: Healdsburg, Santa Rosa Plain, and the Rincon Valley and Santa Rosa Plain Subbasin. The City of Sebastopol overlies the Santa Rosa Plain Subbasin. The groundwater system beneath the Santa Rosa Plain provides water to residents and municipal systems, irrigation water for agriculture, and baseflow to streams, surface water bodies and associated ecosystems. The Santa Rosa Plain is a large geologically complex groundwater basin, with multiple aquifers that exhibit wide variations in well yields and groundwater quality. In addition, the groundwater system is subdivided into several compartments that are separated by fault zones, including the Rodgers Creek Fault, the Sebastopol Fault, and the Trenton Fault.

4.8.2 Regulatory Setting

a. Federal Regulations

Clean Water Act

Congress enacted the CWA, formerly the Federal Water Pollution Control Act of 1972, to restore and maintain the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and non-point source discharges to surface water. Those discharges are regulated by the National Pollution Discharge Elimination System (NPDES) permit process (CWA Section 402). The SWRCB and its nine RWQCBs administer the NPDES permits. In Sonoma County, NPDES permits are administered by the North Coast RWQCB and San Francisco Bay RWQCB.

Individual projects that disturb one or more acres are required to obtain NPDES coverage under the California General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit). The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) describing best management practices (BMP) the discharger would use to prevent and retain stormwater runoff. The SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if BMPs fail; and a sediment monitoring plan if the site discharges directly to a waterbody listed on the 303(d) list for sediment.

Section 401 of the CWA requires any activity that would result in discharge into waters of the U.S. be certified by the RWQCB. This certification ensures the proposed activity would not violate State and/or federal water quality standards. Section 404 of the CWA authorizes the U.S. Army Corps of Engineers to regulate the discharge of dredged or fill material to the waters of the U.S. and adjacent wetlands. Discharges to waters of the U.S. must be avoided where possible and minimized and mitigated where avoidance is not possible. Section 303(d) of the CWA requires states to establish TMDL programs for streams, lakes, and coastal waters that do not meet certain water quality standards.

Applicants of construction projects disturbing one or more acre of soil are required to file for coverage under the SWRCB, Order No. 99-08-DWQ, NPDES General Permit No. CAS000002 for Discharges of Storm Water Runoff Associated with Construction Activity (General Permit).

National Flood Insurance Act / Flood Disaster Protection Act

The National Flood Insurance Act of 1968 made flood insurance available for the first time. The Flood Disaster Protection Act of 1973 made the purchase of flood insurance mandatory for the protection of property located in Special Flood Hazard Areas. These laws are relevant because they led to mapping of regulatory floodplains and to local management of floodplain areas according to guidelines that include prohibiting or restricting development in flood hazard zones.

b. State Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1967 requires the SWRCB and the nine RWQCBs to adopt water quality criteria to protect State waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. The Water Quality Control Plan, or Basin Plan, protects designated beneficial uses of State waters through the issuance of waste discharge requirements and through the development of TMDLs. Anyone proposing to discharge waste that could affect the quality of the waters of the State must make a report of the waste discharge to the RWQCB or SWRCB as appropriate, in compliance with the Porter-Cologne Act.

Sustainable Groundwater Management Act

In September 2014, Governor Brown signed legislation requiring that California's critical groundwater resources be sustainably managed by local agencies. The Sustainable Groundwater Management Act gives local agencies the power to sustainably manage groundwater and requires Groundwater Sustainability Plans (GSP) to be developed for medium- and high-priority groundwater basins.

In September 2014, the governor signed legislation requiring that California's critical groundwater resources be sustainably managed by local agencies. The Sustainable Groundwater Management Act gives local agencies the power to sustainably manage groundwater and requires groundwater sustainability plans to be developed for medium- and high-priority groundwater basins, as defined by the California Department of Water Resources.

The project site overlies the Santa Rosa Plain Subbasin of the Santa Rosa Valley Groundwater Basin.. The Santa Rosa Plain Groundwater Sustainability Agency is the Groundwater Sustainability Agency with authority over the Santa Rosa Plain Subbasin. The Santa Rosa Plain GSA was formed through a Joint Exercise of Powers Agreement (JPA) entered into by the cities of Cotati, Rohnert Park, and Santa Rosa; the Town of Windsor; Gold Ridge Resource Conservation District; Sonoma County (County); Sonoma County Water Agency (Sonoma Water); Sonoma Resource Conservation District; and an organized group of mutual water and Public Utilities Commission-regulated companies (Independent Water Systems). In August 2019 following an adjustment of the Subbasin boundaries, the JPA was amended to include the City of Sebastopol. The Groundwater Sustainability Plan (GSP) for the Santa Rosa Plain Subbasin was submitted to the California Department of Water Resources (DWR) in January, 2022 and approved by DWR on January 26, 2023 (Santa Rosa Plain Groundwater Sustainability Agency, 2023).

California Green Building Standards Code

The California Green Building Standards Code (California Code of Regulations, Title 24, Part 11) includes mandatory measures for residential and nonresidential development. For example, Section 4.106.2 requires residential projects that disturb less than one acre and are not part of a larger common plan of development to manage stormwater drainage during construction through on-site retention basins, filtration systems, and/or compliance with a stormwater management ordinance. Section 5.106.1 requires newly constructed nonresidential projects and additions of less than one acre to prevent the pollution of stormwater runoff from construction through compliance with a local ordinance or implementing BMPs that address soil loss and good housekeeping to manage equipment, materials, and wastes. Section 5.303 sets measures for indoor water use for non-residential development requiring metering devices to conserve water.

State Water Conservation Requirements

Executive Order B-37-16 established a new water use efficiency framework for California. The order bolstered the state's drought resilience and preparedness by establishing longer-term water conservation measures that include permanent monthly water use reporting, new urban water use targets, reducing system leaks and eliminating clearly wasteful practices, strengthening urban drought contingency plans, and improving agricultural water management and drought plans. Based on monthly water use reporting, most urban water suppliers reported sufficient supplies to meet demand in three additional dry years and are not subject to state conservation mandates. On February 8, 2017, SWRCB adopted an emergency water conservation regulation to amend and extend the May 2016 regulation. The amended regulation allows certain suppliers the opportunity to submit or resubmit their water supply reliability assessments.

c. Regional and Local

Municipal Separate Storm Sewer System

RWQCBs issue stormwater discharge permits, with a Phase I Municipal Separate Storm Sewer System (MS4) (Order R1-2015-0030) applicable to the City of Sebastopol (SWRCB, 2022). The MS4 programs implement and enforce BMPs to reduce the discharge of pollutants from municipal separate storm sewer systems.

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The North Coast Regional Water Quality Control Board (NCRWQCB) issues the NPDES Municipal Separate Storm Sewer Systems (MS4) Permit (Permit) requiring Governing Agencies to implement a myriad of programs to prevent pollution, improve and protect storm water quality, reduce storm water runoff, and enhance the ecologic vitality of local creeks and waterways. The most recent permit update took effect January 6, 2016 and required that the previous version of this LID Technical Design Manual (LID Manual) be revised to meet the new permit requirements. The City of Cloverdale, City of Cotati, City of Healdsburg, City of Rohnert Park, City of Sebastopol, City of Ukiah, and Town of Windsor have been added to the County of Sonoma, Sonoma County Water Agency, and City of Santa Rosa as CoPermittees. The 2017 LID Manual provides technical guidance for project designs that require the implementation of permanent stormwater BMPs. This manual supersedes the 2005 Standard Urban Storm Water Mitigation Plan and satisfies Order R1-2015-0030, NPDES Permit CA0025054 (LID Manual CoPermittees, 2017).

City of Sebastopol Water System Master Plan

In 2006, the City approved the Sebastopol Water System Master Plan, which is intended to assist with planning water system improvements necessary to comply with current City zoning ordinances, City Standard Details and Specifications, and federal fire regulations. The plan describes the existing water system and estimates water demand projections. Additionally, it makes recommendations for water system improvements across the city (City of Sebastopol, 2005).

City of Sebastopol Water Shortage Contingency Plan

In June 2023, the City approved the Sebastopol Water Supply Contingency Plan (WSCP), which seeks to conserve the available water supply and ensure the integrity of the water system. The plan outlines drought response stages, triggers, and response actions (City of Sebastopol, 2023).

Sebastopol General Plan

The City's 2016-2035 General Plan (City of Sebastopol 2016b) Community Services and Facilities Element includes goals and policies related to water. The following policies are relevant to the project.

Goal COS 3: Protect and Enhance Water Resources in Local Creeks, Riparian Habitat, Wetlands, the Laguna De Santa Rosa Watershed, Atascadero Creek, and Aquatic Habitat

Policy COS 3-1 Protect and enhance streams, channels, seasonal and permanent marshland, wetlands, sloughs, riparian habitat, and vernal pools through sound land use planning, community design, and site planning.

Policy COS 3-2 Aggressively pursue a wide range of opportunities to protect water quality and manage local surface water resources.

Policy COS 3-3 Support rehabilitation of any culverted or open existing channelized waterways, as feasible, to remove concrete linings and allow for a connection between the stream channel and the natural water table. Avoid creating additional culverted or open channelized waterways, unless no other alternative is available to protect human health, safety, and welfare.

Policy COS 3-4 Where feasible, support restoration of any existing culverted or channelized waterways to a more natural condition. Restoration efforts should provide for naturalized hydraulic functioning. Restoration should also promote the growth of riparian vegetation to effectively stabilize banks, screen pollutants from runoff entering the channel, enhance fisheries, and provide other opportunities for natural habitat restoration.

Policy COS 3-5 Require discretionary projects, as well as new flood control and stormwater conveyance projects, to integrate best management practices (BMPs) and natural features to the greatest extent feasible, while ensuring that these features adequately convey and control stormwater to protect human health, safety, and welfare. New flood control projects should utilize the natural benefits of slowing and spreading surface water runoff through natural features in order to promote groundwater infiltration, natural removal of contaminants, and enhancing riparian habitat health.

Policy COS 3-6 Require the use and site design integration of natural features such as bioswales, vegetation, retention ponds, and other measures to remove surface water pollutants prior to discharge into surface waters.

Policy COS 3-7 Preserve the existing and future floodwater carrying capacity of creeks and channels during creek restoration.

Policy COS 3-8 Require new development to include maintained and managed setbacks and buffers along creeks, wetlands, riparian corridors, and adjacent to sensitive habitat.

Policy COS 3-9 New development adjacent to creeks and streams should include opportunities for beneficial uses, such as flood control, ecological restoration activities, public access trails, and walkways.

Goal COS 5: Protect, Manage, and Enhance Groundwater as a Valuable and Limited Shared Resource

Policy COS 5-1 Groundwater should be managed as part of a broader integrated approach that includes surface water, conservation, water quality, reuse, environmental stewardship, and other water management strategies.

Policy COS 5-2 Operate the City's well system in such a manner as to not exceed the sustainable yield of the local groundwater aquifer.

Policy COS 5-3 Encourage new groundwater recharge opportunities and protect existing groundwater recharge areas throughout the Sebastopol Planning Area.

Policy COS 5-4 Promote the use of permeable surface materials and provide for ample areas of open space and naturalized land in order to decrease surface runoff and promote groundwater recharge.

Policy COS 5-5 Seek opportunities to expand the groundwater recharge capacity of City-owned parcels throughout Sebastopol.

Policy COS 5-6 Implement water conservation measures as a key strategy in sustainably managing local groundwater supplies.

Policy COS 5-7 Implement greenhouse gas reduction measures and participate in regional efforts to study the effects of climate change on precipitation levels as a key strategy in sustainably managing local groundwater supplies.

Policy COS 5-8 Continue to encourage and support federal, state, and local research on and monitoring of local groundwater conditions, aquifer recharge, watersheds and streams where needed to assess groundwater quantity and quality.

Policy COS 5-9 Protect the water quality obtained from City wells.

Policy COS 5-10 Reduce agricultural and pharmaceutical contamination of potable water supplies in the local aquifer.

Goal CSF 3: Provide an Adequate, Clean, Safe, and Environmentally Sound Water Supply to All Existing and Future Water Users in Sebastopol.

Policy CSF 3-1 Prior to the approval of major new development, Specific Plans, major infrastructure improvements, or other projects that would result in increased demand for public water conveyance and treatment, such projects must demonstrate proof of adequate water supply (e.g., that existing services are adequate to accommodate the increased demand, or improvements to the capacity of the system to meet increased demand will be made prior to project implementation) and that potential cumulative impacts to water users and the environment will be addressed.

Policy CSF 3-2 Continue to implement a comprehensive water strategy that balances the need to supply water to all users served by the City with potable water use reduction measures.

Policy CSF 3-3 Routinely assess the City's ability to meet the demand for potable water by periodically updating the Water Master Plan.

Policy CSF 3-4 Ensure the water system and supply is adequate to match the rate of growth and future development.

Policy CSF 3-5 Priority shall be given to serving existing water uses over new water uses.

Policy CSF 3-6 Maintain and ensure adequate emergency water supplies.

Policy CSF 3-7 Continue to implement the City's water conservation requirements established in the Municipal Code.

Policy CSF 3-8 Ensure safe drinking water standards are met throughout the community.

Policy CSF 3-9 The Public Works Department shall continue to test potable water on schedules dictated by the State and the U.S. Environmental Protection

Goal CSF 4: Provide Adequate Sewer Service Capacity to Serve Existing and Future Demands

Policy CSF 4-1 Maintain adequate sewage conveyance infrastructure to meet existing and projected demand throughout the buildout of the General Plan.

Policy CSF 4-2 Ensure sewage system capacity is adequate to match the rate of development.

Policy CSF 4-3 Work with the Santa Rosa Subregional Wastewater System to assist in the maintenance of an adequate sewage treatment and disposal system.

Policy CSF 4-4 Ensure adequate funding is available for needed improvements to the wastewater conveyance infrastructure, and to reduce stormwater infiltration to the greatest extent feasible.

Policy CSF 4-5 Comply with the current Statewide General Waste Discharge Requirements concerning the operation and maintenance of the City's sanitary sewer collection system.

Policy CSF 4-6 Prior to the approval of development that would result in substantial increased demand for municipal sewage conveyance and treatment, require projects to demonstrate that existing services are adequate to accommodate the increased demand or that improvements to the capacity of the system to meet increased demand will be made prior to project implementation.

Policy CSF 4-7 Review new development for consistency with the Sewer Collection System Master Plan and require new development to pay fair-share payments towards implementation of system improvements identified in the Sewer Collection System Master Plan.

Policy CSF 4-8 Prioritize sewer service improvements to areas within the City that pose a threat to public health and the environment as a result of deficiencies in existing sewer or septic systems.

Policy CSF 4-9 Ensure future sewer and septic systems are designed to meet or exceed all applicable water quality standards and are located to protect waterways and groundwater resources.

Goal SA 2: Reduce Risks to Human Life, Property, and Public Services Associated with Flood Hazards Policy

Policy SA 2-1	Support strong local and countywide measures to protect and increase the floodwater storage capacity in the Laguna de Santa Rosa.
Policy SA 2-2	Utilize the most recent Federal Emergency Management Agency's Flood Insurance Rate Maps (FIRM) to reduce risk of flooding, identify special flood hazard areas subject to 100-year flood inundation, and calculate flow rates within identified stream channels. Once available, also utilize Department of Water Resources 200- year floodplain maps to identify areas subject to potential 200-year flood inundation.
Policy SA 2-3	Continue to work with the Sonoma County agencies to ensure that additional storm drain runoff resulting from development occurring in unincorporated areas upstream from drainage channels in the Sebastopol Planning Area is adequately mitigated through improvements on-site and/or downstream.
Policy SA 2-4	Continue to coordinate with the Sonoma County Water Agency in pursuing all available sources of funding to finance improvements to storm drain facilities.
Policy SA 2-5	Reduce flood risk to development and infrastructure by maintaining effective flood drainage systems and regulating construction.
Policy SA 2-6	Maintain unobstructed water flow in the storm drainage system.
Policy SA 2-7	Locate new critical facilities and essential public buildings – including hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communications facilities – outside of flood hazard zones to protect from any unreasonable risk of flooding.
Policy SA 2-8	Require all development projects to demonstrate how storm water runoff will be detained or retained on-site, treated, and/or conveyed to the nearest drainage facility as part of the development review process. Project applicants shall demonstrate that project implementation would not result in increases in the peak flow runoff to adjacent lands or drainage facilities that would exceed the design capacity of the drainage facility or result in an increased potential for offsite flooding.
Policy SA 2-9	Prohibit development in the 100-year flood zone unless requirements of the City's Flood Damage Protection Ordinance criteria are met.
Policy SA 2-10	Ensure that the structural and operational integrity of critical facilities is maintained during flooding.
Policy SA 2-11	Monitor ongoing efforts by Federal and State agencies to update flood hazard maps, including 200-year flood plain mapping, that affect the City and Planning Area.
Policy SA 2-12	Ensure that flood control and management facilities are integrated with efforts to improve water supply and management. Consider factors such as groundwater recharge, surface water quality, and the protection of riparian

habitat when implementing plans and improvements to construct and maintain flood control and management facilities.

Policy SA 2-13 Encourage and accommodate multipurpose flood control projects that incorporate recreation, resource conservation, preservation of natural riparian and biological habitat, and agricultural uses. Where appropriate and feasible, the City shall also encourage the use of flood and/or storm water retention facilities for use as groundwater recharge facilities.

Sebastopol Municipal Code

Title 13 of the Sebastopol Municipal Code (SMC) identifies the required City permits for the construction and operation of water and wastewater connections. In addition, SMC Chapter 13.20 incorporates the City's stormwater ordinance.

4.8.3 Impact Analysis

a. Significance Thresholds and Methodology

According to Appendix G of the *CEQA Guidelines*, hydrology and water quality impacts related to the proposed project would be considered significant if the project would:

1. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality;
2. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;
3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
   a. Result in substantial erosion or siltation on- or off-site;
   b. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
   c. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems of provide substantial additional sources of polluted runoff; or
   d. Impede or redirect flood flows;
4. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or
5. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

b. Project Impacts and Mitigation Measures

Threshold 1:	Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Impact HYD-1 **DEVELOPMENT FACILITATED BY THE PROJECT WOULD NOT VIOLATE WATER QUALITY STANDARDS OR WASTE DISCHARGE REQUIREMENTS, OR OTHERWISE SUBSTANTIALLY DEGRADE SURFACE OR GROUNDWATER QUALITY. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION.**

Construction

Construction activities could result in soil erosion due to earth-moving activities such as excavation, grading, soil compaction and moving, and soil stockpiling.

As described in Section 4.7, *Hazards and Hazardous Materials*, the project site is associated with an active Voluntary Agreement cleanup case with regulatory agency oversight by the Department of Toxic Substances Control (DTSC) (DTSC 2023a). Sampling results indicated that organochlorine pesticides were present in soil at concentrations below their respective screening levels used for residential land use, but above California hazardous waste levels at two boring locations within the existing trees' driplines "to remain after redevelopment" and arsenic and lead were detected at concentrations above their respective naturally occurring background concentrations in California soils (Stantec 2022).

The project would implement Mitigation Measure HAZ-3a which would require the DTSC continue to be utilized for agency oversight of assessment and remediation of the project site through completion of construction activities and Mitigation Measure HAZ-3b which requires the preparation of a Soil Management Plan (SMP) prior to commencement of construction and grading activities at the project site. A Removal Action Plan was prepared for the project site and determined soil burial, capping, and deed restriction was the recommended removal action for the project site (Stantec, 2023). Excavated contaminated soil would be buried under six feet of clean soil on top of the on-site burial cells. Based on the relatively shallow depth of known soil impacts (less than 5 feet bgs) and planned depth of excavation for the proposed project (less than 10 feet bgs), groundwater is not expected to be encountered during construction activities at the project site.

Construction activities would use hazardous materials such as diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, cement slurry, and other fluids required for the operation of construction vehicles or equipment. Runoff during storm events would follow the general topography of the project site, and after grading and excavation activities, runoff would be directed to flow in the same direction onto Gravenstein Highway. The project would be required to comply with State and local water quality regulations designed to control erosion and protect water quality during construction. This includes compliance with the requirements of the NPDES Construction General Permit, which requires preparation and implementation of a SWPPP for projects that disturb one acre or more of land. Since the project site area is greater than one acre, construction activities would be subject to the NPDES Construction General Permit and would be required to develop a SWPPP. The SWPPP must include erosion and sediment control BMPs that would meet or exceed measures required by the NPDES Construction General Permit. Construction BMPs could include inlet protection, silt fencing, fiber rolls, stabilized construction entrances, stockpile management, solid waste management, and concrete waste management.

The Sebastopol Municipal Code also includes construction requirements intended to prevent the degradation of water quality during construction. SMC Chapter 15.08 adopts California Building Code Appendix J Section J110, Erosion Control which would require preparation of erosion control plans in conformance with the *Erosion and Sediment Control Field Manual* published by the San Francisco Regional Water Quality Control Board, and the State Water Quality Control Board Construction General Permit (WQO 99-08-DWQ or latest adopted order). SMC Chapter 13.20 requires the reduction of pollutants in stormwater discharge to the maximum extent practicable and prohibits non-stormwater discharge to the storm drain system.

Compliance with the regulations and required permits discussed above, and implementation of Mitigation Measures HAZ-3a and HAZ-3b, would reduce the risk of water degradation from soil erosion and other pollutants related to construction activities. Because violations of water quality standards would be minimized through existing regulations, project construction would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Impacts from construction activities under the proposed project would be less than significant.

Operation

The project would be required to manage stormwater treatment in accordance with the North Coast RWQCB Order No. R1-2015-0030. Pursuant to SMC Chapter 13.20, which requires the reduction of pollutants in stormwater discharge to the maximum extent practicable and prohibits non-stormwater discharge to the storm drain system. In addition to stormwater runoff, polluted wastewater could be discharged by development facilitated by the project but pollution would be limited primarily to common household solvents, paints, chemicals used for cleaning and building maintenance, and landscaping supplies and would not be substantially different from household chemicals and solvents already in general and wide use throughout any residential area. Once the project is operational, the contaminated media described above would mostly be removed or covered and would no longer pose a risk.

Development facilitated by the project would increase wastewater flows to the applicable local wastewater purveyor. The SMC Chapter 13.20 also prohibits the discharge of industrial waste or any garbage, except shredded garbage, or any solids, semi-solid or liquid substances resulting from any garbage, service station, or automobile wash-rack into the sanitary sewer system. Required compliance with the Code would ensure that wastewater discharges to the sanitary sewer system and local wastewater treatment plants are properly and effectively treated to meet or exceed discharge requirements of the NPDES/Waste Discharge Requirement permit.

Runoff from all proposed impervious surfaces would be directed toward the proposed vegetated buffer strips and the existing detention pond that has enough retention capacity to meet the hydromodification requirement of 100 percent volume capture. Storm water treatment would be achieved in the vegetated buffer strips prior to discharge from the site to the detention pond through a stormdrain network (Appendix H).

In addition, wastewater purveyors collect monthly fees from system users for wastewater flows. Development associated with the proposed project would be subject to user fees, which would in turn fund any necessary operating and capacity infrastructure needs for wastewater flows.

Implementation of the regulations, permit requirements, BMPs, Mitigation Measures HAZ-3a and HAZ-3b and policies described above would prevent or minimize impacts related to water quality and ensure that development facilitated by the project would not cause or contribute to the degradation of water quality in receiving waters. Development facilitated by the project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality, and water quality impacts would be less than significant.

Mitigation Measures

Mitigation Measures HAZ-3a and HAZ-3b would apply.

Significance After Mitigation

With implementation of HAZ-3a and HAZ-3b, impacts would be less than significant.

Threshold 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?

Impact HYD-2 **DEVELOPMENT FACILITATED BY THE PROJECT WOULD NOT INTERFERE SUBSTANTIALLY WITH GROUNDWATER RECHARGE SUCH THAT THE PROJECT MAY IMPEDE SUSTAINABLE GROUNDWATER MANAGEMENT OF LOCAL GROUNDWATER BASINS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.**

As discussed in Section 4.8.1, *Setting*, water was detected under the site at 28.5 feet below ground surface (Stantec, 2022). Although specific designs of foundation systems are not available at this time, project construction is not anticipated to exceed depths of 20 feet below ground surface, based on typical construction for residences with no basements. Therefore, groundwater dewatering is not anticipated to be necessary during project construction activities, as groundwater below the project site is not likely to be encountered during excavation activities.

Water demand during construction activities would be temporary and limited to the construction period. The majority of demand would result from dust suppression spraying, which would only be required for exposed soil during certain construction activities and wind exposure conditions. Water demand during construction would be temporary, and only small amounts of water would be required. The total amount of water used for construction activities would be minimal and would not deplete groundwater sources. Impacts would be less than significant during construction.

This project site catchment area has been broken into seven drainage areas where runoff would be collected in separate storm drain systems during project operation. Surface runoff from impervious surfaces would be directed toward vegetated buffer strips where runoff would be treated before entering the site storm drain network. The new storm drain network would connect to the existing storm drain of the office park neighboring the project site to the west, which ultimately discharges to the public storm drain system on Gravenstein Highway.

The office park drainage system includes an existing detention pond that provides detention volume and keeps the peak flow discharged from that project site to the 10-year pre-construction level. This detention pond is located adjacent to the western boundary of the project site, to the northwest of the existing office park development. As part of the project, modifications to the inlet and outlet structures of this pond to increase its detention volume and provide additional storage volume as required by the Low Impact Development manual would also be completed.

Although the project would increase both impervious surfaces and demand for groundwater on site, runoff from impervious surfaces would be detained in detention basins and recharged adjacent to the site, resulting in the same amount of groundwater recharge post-project as under existing conditions. Therefore, the project would not substantially interfere with groundwater recharge at the project site.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 3a:	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 which would result in substantial erosion or siltation on- or off-site?

Impact HYD-3 THE PROPOSED PROJECT WOULD ALTER DRAINAGE PATTERNS AND INCREASE RUNOFF IN THE AREA BUT WOULD NOT RESULT IN SUBSTANTIAL EROSION OR SILTATION ON- OR OFF- SITE. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Development of the proposed project would result in a net increase of impervious surfaces on the project site, as the site is currently undeveloped. New impervious surfaces would increase the rate and/or amount of surface runoff, redirect runoff to different discharge locations, and concentrate runoff from sheet flow to channelized flow. As described under Impact HYD-1, the project would be required to implement erosion and sedimentation controls as part of required NPDES Construction General Permit BMPs, would be required to maintain disturbed surfaces during construction for erosion control pursuant to SMC Chapter 13.20, and would be required to prepare and implement an erosion control plan. The proposed project would also be subject to the North Coast RWQCB Post-Construction Requirements related to erosion control. Additionally, stormwater runoff would be captured and controlled by proposed on-site stormwater detention facilities. This would ensure no increase in off-site runoff or associated erosion or siltation due to substantially increased runoff. Through implementation of these regulatory requirements, the project would not result in substantial erosion or siltation on or off site. Impacts would be less than significant.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 3b:	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 which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?
Threshold 3d:	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 which would impede or redirect flood flows?
Threshold 4:	In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?

Impact HYD-4 THE PROPOSED PROJECT WOULD ALTER DRAINAGE PATTERNS AND INCREASE RUNOFF IN THE AREA BUT WOULD NOT RESULT IN INCREASED FLOODING ON OR OFF SITE. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

According to maps from the Federal Emergency Management Agency (FEMA), the project site is not located within a flood zone (Map #06097C0715E, effective December 2, 2008). There would be no new fill material deposited in a mapped floodplain; and runoff from all proposed impervious surfaces would be directed toward the proposed vegetated buffer strips and the existing detention pond that has enough retention capacity to meet the hydromodification requirement of 100 percent volume capture. Stormwater detention analyses conducted by Adobe Associates Inc. confirm that the existing detention facility has sufficient capacity to limit the 10-year peak discharge flow from the combined watershed of the proposed project site and existing Office Park site under post-construction conditions to no more than runoff from the combined watershed under pre-development conditions (Appendix H). Storm water treatment would be achieved in the vegetated buffer strips prior to discharge from the site to the detention pond through a stormdrain network (Appendix H). Therefore, although the project would result in increased impervious surface area on site, the project would not result in increased flooding on or off site. Impacts would be less than significant.

The project site is not within a Tsunami Hazard Zone (California Department of Conservation, 2022). The project site is not located within close proximity to a confined water body that would pose a significant risk from a seiche. Impacts related to risk of pollutant release in tsunami or seiche zones would be less than significant.

The project site is located approximately 2.5 miles southwest of the Delta Pond, which has a significant downstream dam inundation hazard (Department of Water Resources, 2020). In addition, Warm Springs Dam is located in northern Sonoma County approximately 30 miles north of the City. The project site is in an area where development already exists and would not increase dam inundation hazards. The City's Local Hazard Mitigation Plan categorizes the overall significance of dam inundation in the City as Low (City of Sebastopol 2021). Based on the dam capacity of Delta Pond and the distance of Warm Springs Dam, it is unlikely that much risk would be imposed on those areas near Sebastopol, and based on the dam inundation mapping for the Delta Pond dam, failure or breach of this dam will not impact the City of Sebastopol (City of Sebastopol 2021). Impacts regarding dam inundation would be less than significant.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 3c:	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 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?

Impact HYD-5 THE PROPOSED PROJECT WOULD ALTER DRAINAGE PATTERNS AND INCREASE RUNOFF IN THE AREA BUT WOULD NOT EXCEED THE CAPACITY OF EXISTING OR PLANNED STORMWATER DRAINAGE SYSTEMS OR PROVIDE SUBSTANTIAL ADDITIONAL POLLUTED RUNOFF. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION.

An office park is located directly southwest of the project site. Drainage design for this office park includes the storm drain system and an onsite detention basin at the northwestern most corner of the site. The proposed project includes onsite drainage improvements with bioretention facilities (vegetated buffers and bioswale) and a storm drain network. Runoff from impervious surfaces would drain through the onsite bioretention facilities and storm drain network before discharging to the existing storm drain network of the office park. As part of the project, the existing detention pond and its inlet and overflow structures would be modified to detain and control drainage from the office park and project site in order to not exceed pre-development drainage levels.

In the Preliminary Drainage Report by Adobe Associates Inc. (Appendix H), peak runoff from the combined office park and proposed project site in undeveloped condition was calculated as 15.48 cubic feet per second (cfs) for 10-yr storm events with total runoff volume of 95,024 cubic feet (ft). The proposed rebuilt detention pond and its inlet/outlet and overflow structures were included in the post-construction analysis model. The total (unmitigated) peak runoff from the combined office park and proposed project site in developed condition was calculated as 29.21 cubic feet per second (cfs) with a total runoff of 154,119 cubic feet (ft) for 10-yr storm events. The rebuilt detention pond was found to be sufficient to regulate the peak discharge flow to 15.38 cubic feet per second (cfs) at the off-site outfall (Appendix H).

Additionally, as described under Impact HYD-1, the project would implement stormwater quality controls as required by the RWQCB and SMC, and Mitigation Measures HAZ-3a and HAZ-3b which would ensure the project does not result in polluted runoff exiting the project site during both construction and operation. The proposed project would not exceed the capacity of existing or planned stormwater drainage systems or result in substantial additional sources of polluted runoff. Impacts would be less than significant.

Mitigation Measures

HAZ-3a and HAZ-3b

Significance After Mitigation

With implementation of HAZ-3a and HAZ-3b, impacts would be less than significant.

Threshold 5:	Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Impact HYD-6 THE PROPOSED PROJECT WOULD NOT CONFLICT WITH OR OBSTRUCT THE NORTH COAST RWQCB BASIN PLAN OR SANTA ROSA PLAIN SUBBASIN GSP, PURSUANT TO COMPLIANCE WITH APPLICABLE WATER QUALITY REGULATIONS. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION.

Water Quality Control Plan

Development of the proposed project could affect water quality through construction and operational activities. The Basin Plan identifies beneficial uses for surface water and groundwater and establishes water quality objectives to attain those beneficial uses. The identified beneficial uses and the water quality objectives to maintain or achieve those uses are together known as water quality standards. A conflict with the Basin Plan would occur if the project would degrade the water quality of surface water or groundwater within the planning area such that the designated beneficial uses are no longer attainable.

As discussed under Impact HYD-1, compliance with relevant water quality regulations and policies, including NPDES Construction General Permit, North Coast RWQCB Order No. R1-2015-0030, Mitigation Measures HAZ-3a and HAZ-3b, and SMC requirements, would reduce the risk of water degradation from soil erosion and other pollutants related to project construction and operational activities. Therefore, the proposed project would not result in water quality impacts to nearby surface waters protected by the Basin Plan, would maintain the identified beneficial uses of nearby surface and groundwater, and would not conflict with the Basin Plan during construction or operation. Impacts would be less than significant.

Sustainable Groundwater Management Plan

The Santa Rosa Plain Groundwater Sustainable Agency (SRPGSA) is the GSA with authority over the Santa Rosa Valley Groundwater Basin. SRPGSA adopted the Santa Rosa Plain Subbasin Groundwater Sustainability Plan (GSP) in January 2023. The GSP includes projects and management actions intended to ensure sustainable management of the basin, including recharge projects, demand management strategies, and implementation actions associated with groundwater extraction. While the GSP does not provide specific requirements for new development within the basin, the project includes on-site stormwater capture and detention, which would be consistent with the GSP goals related to groundwater recharge in the basin.

Consistent with the goals of the GSP, the project would comply with established regulations and requirements for stormwater control, including through the implementation of post-construction stormwater management controls, and the upgrade of stormwater detention areas, as described under Impact HYD-1. The GSP states that the Basin has historically been stable. As described in Impact HYD-2, the project would not interfere with sustainable management of the groundwater basin. Therefore, the project would not impair the implementation of the GSP, and impacts would be less than significant.

Mitigation Measures

Mitigation Measures HAZ-3a and HAZ-3b would apply.

Significance After Mitigation

With implementation of HAZ-3a and HAZ-3b, impacts would be less than significant.

4.8.4 Cumulative Impacts

The geographic scope for cumulative hydrology and water quality impacts is the North Coast Hydrologic Unit and Santa Rosa Valley Basin in which the project site is located. This geographic scope is appropriate for hydrology and water quality because water quality impacts can affect the entirety of the watershed and groundwater basin where the impact occurs. Cumulative development within this geographic scope includes development associated with cumulative projects within nearby portions of Sebastopol.

Cumulative development would generally increase impermeable surface area in the watershed. Development would potentially increase peak flood flows, alter drainage patterns, reduce groundwater recharge, and increase pollutants in the regional stormwater. However, as with the proposed project, cumulative development would be required to adhere to all applicable State and local regulations designed to control erosion and protect water quality, including applicable Municipal Codes, the NPDES Construction General Permit, and grading permit requirements, and Mitigation Measures HAZ-3a and HAZ-3b. All construction sites larger than one acre in size would be required to prepare and submit a SWPPP, thereby reducing the risk of water degradation on- and off-site from soil erosion and other pollutants. In addition, the North Coast RWQCB post-construction requirements for stormwater management encourage and require for certain projects, on-site treatment and infiltration of stormwater runoff. This would reduce the quantity of stormwater runoff that enters the storm drainage system and discharges to surface waters. Therefore, cumulative impacts to peak runoff, flooding, groundwater recharge, or water quality would be less than significant. As described under Impacts HYD-1 through HYD-6, the proposed project's water quality and groundwater recharge impacts would be less than significant with mitigation. Implementation of the proposed project would not contribute to cumulative impacts to peak runoff, flooding, groundwater recharge, or water quality. Therefore, the proposed project would not result in a considerable contribution to a significant cumulative impact.

As discussed under Impacts HYD-2 and HYD-6, the proposed project would increase the demand for water, which would be derived solely from groundwater sources. Cumulative development would also increase demand for groundwater supplies. It is anticipated that cumulative development would result in a significant cumulative impact. The proposed project includes the upgrade of stormwater detention areas, which would be consistent with GSP goals for groundwater recharge, and as described under Impact HYD-2, the project would allow for a net recharge to groundwater and would not interfere with sustainable management of the groundwater basin. Consequently, the proposed project would not result in a considerable contribution to a significant cumulative impact related to groundwater.

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4.9 Land Use and Planning

This section analyzes the proposed project's consistency with applicable land use plans, policies, and regulations, including the City of Sebastopol General Plan and the City of Sebastopol Municipal Code (SMC) and identifies whether potential environmental effects could arise from any inconsistencies. Potential impacts related to the proposed project and its neighboring land uses are discussed in greater detail in other sections of the EIR.

4.9.1 Environmental Setting

The project site encompasses approximately 6.1 acres across two parcels, identified by Assessor's Parcel Numbers (APN) 060-261-028 and 060-261-026. The project site is currently undeveloped but includes existing vegetation and mature trees. The project site is generally flat and includes numerous mature trees across the parcel. The elevation is approximately 200 feet above mean sea level.

An informal pedestrian pathway bisects the site to connect the existing O'Reilly Media Center parking lot to the West County Trail, allowing use of the trail. To the east, the site is directly adjacent to the West County Trail, a paved trail that links Sebastopol with areas to the Northwest, including Graton and Forestville, and connects in downtown Sebastopol to the Joe Rodota Trail, which connect downtown Santa Rosa and Sebastopol. These trails run parallel to Highway 116 to the North of the site and along Highway 12 from eastern Sebastopol to Santa Rosa and is a popular route for cyclists and pedestrians.

The project site is in a neighborhood characterized by a mix of uses including residential, educational, commercial, and recreational. The Sebastopol Charter School and single-family residential uses are located north of the site, across the West County Trail. Uses to the east include primarily single-family neighborhoods as well as the West County Trail. South of the project site uses are comprised of primarily commercial uses, including an automotive store, mixed commercial and residential, and several single-family residences. The existing O'Reilly Media Center directly abuts the site to the west, and a mix of residential uses are located further west, across Gravenstein Highway North.

As discussed in Section 2, *Project Description*, the project site is designated as Office/Light Industrial (OLI) in the 2016 City of Sebastopol General Plan. The General Plan OLI designation is intended "to promote well planned, integrated business parks, which will serve as major employment center within the community" (Sebastopol 2015). The Office/Light Industrial designations only apply to sites of three (3) acres or larger and must be implemented through the PC-Planned Community zoning process. Residential uses are allowed at a density of 12.1 to 25 units per acre as a secondary use to the primary office/light industrial uses allowed in this land use designation.

The project site is designated as Office/Light Industrial (OLM) by the City of Sebastopol Zoning Ordinance. According to Section 17.25.010 of SMC, the purpose of the OLM District is to implement the "Office/Light Industrial" land use category of the General Plan and to provide areas for well-planned, integrated business parks that may include office and related uses. Section 17.25.020 of SMC lists the allowed uses of the OLM district which includes R7-Multifamily Residential (12.1-25 du/ac) with Planning Commission review.

4.9.2 Regulatory Setting

a. State Regulations

Planning and Zoning Law

State law requires each city and county in California to adopt a general plan for the physical development of the land within its planning area (Government Code Sections 65300-65404). The general plan must contain land use, housing, circulation, open space, conservation, noise, and safety elements, as well as any other elements that the city or county may otherwise be required to, or wish to, adopt. The circulation element of a local general plan must be correlated with the land use element.

Zoning authority originates from city and county police power and from the State's Planning and Zoning Law, which sets minimum requirements for local zoning ordinances. The city or county zoning code is the set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code presents standards for different uses and identifies which uses are allowed in the various zoning districts of the jurisdiction. Since 1971, State law has required the city or county zoning code to be consistent with the jurisdiction's general plan.

b. Regional Regulations

Plan Bay Area 2050

Association of Bay Area Governments (ABAG)/Metropolitan Transportation Commission (MTC) Plan Bay Area 2050, adopted in October 2021, is a long-range, integrated transportation and land-use plan for the nine-county San Francisco Bay Area. The Plan is the combined Sustainable Communities Strategy and Regional Transportation Plan (also referred to as the RTP/SCS) that describes where and how the region can accommodate the projected 1.4 million new households and 5.4 million new jobs between 2015 and 2050. The Plan also details the regional transportation investment strategy over the next 28 years. Growth in the plan area is promoted in Priority Development Areas and limited in Priority Conservation Areas to promote preservation of key resources. The Plan contains one main vision that is driven by five guiding principles focused on affordability, connectedness, diversity, physical health, and community vibrancy (ABAG 2021).

c. Local Regulations

City of Sebastopol General Plan

The City of Sebastopol General Plan identifies the community's vision for the future and provides a framework that will guide decisions on growth, development, and conservation of open space and resources in a manner that is consistent with the quality of life desired by the city's residents and businesses (City of Sebastopol 2016).

Land Use Element

The Land Use Element demonstrates the City's commitment to protecting and enhancing Sebastopol's unique character and small-town feel, while providing for economic development opportunities. The Land Use Element includes provisions aimed at providing a range of housing types that promote a safe and family-oriented living environment. Residential and commercial growth is focused within the city limits, with higher density uses focused within the Central Core (City of Sebastopol 2016). The Land Use Element of the Sebastopol General Plan (2016) contains the following objectives and policies most relevant to the proposed project:

Goal LU 1: Maintain Sebastopol as a Unique, Charming, and Environmentally Sensitive Small Town that Provides Residents, Businesses, and Visitors with Opportunities to Enjoy a High Quality of Life

Policy LU 1-1 Through appropriate land use practices, maintain a supply of developable mixed use, commercial, industrial, and residential lands sufficient to meet desired growth and economic needs over the planning period.

Policy LU 1-2 Avoid urban sprawl by concentrating development within the City limits; favor infill development over annexation.

Policy LU 1-3 Require new development to occur in a logical and orderly manner, focusing growth on infill locations and areas designated for urbanization on the Land Use Map and be subject to the ability to provide urban services, including paying for any needed extension of services.

Policy LU 1-4 Assign the following range of land use designations throughout the City and to parcels within the UGB, as shown in the Land Use Map (Figure 2.1): Very Low Density Single Family Residential, Low Density Single Family Residential, Medium Density Residential, This designation is suitable for duplexes, apartments, townhouses, and other attached dwelling units. Commercial/Office, Central Core, Light Industrial, Open Space, Parkland, Community Facilities, High Density Residential, Office/Light Industrial.

High Density Residential: Designates areas suitable for multifamily dwellings at a density of 12.1 to 25 units per acre. This designation is suitable for duplexes, apartments, townhouses, and other attached dwelling units.

Office/Light Industrial: This designation synthesizes Office and Light Industrial classifications and is intended to promote well planned, integrated business parks, which will serve as major employment center within the community. The Office/Light Industrial designations only applies to sites of three (3) acres or larger and must be implemented through the PC-Planned Community zoning process. Land uses within business parks shall be limited to non-polluting, “clean” industries and businesses with primary permitted uses including corporate and administrative offices and research development uses. Ancillary uses shall be allowed under this designation, which may include warehousing and distribution, exercise facilities, child care uses, and food service uses which provides support services to primary uses. Residential uses are allowed as a secondary use to the primary office/light industrial uses allowed in this land use designation at a density of 12.1 to 25 units per acre. Maximum FAR shall not exceed 1.5 (not including the residential use).

Policy LU 1-6 Where appropriate, encourage clustered development and the clustering of housing so that larger areas of open space may be permanently preserved. Clustered development may provide flexibility in site design and layout to allow for smaller lot sizes, but shall not allow a project to exceed the gross density ranges established under Policy LU 1-4.

Policy LU 1-7 Encourage new development to be contiguous to existing development, whenever possible.

Policy LU 1-8 Do not allow development in areas not served by municipal utilities.

Goal LU 5: Preserve the Unique Character and Ambiance of Residential Areas and Maintain Residential Neighborhoods as Safe and Attractive Places to Live With Convenient Access to Services, Recreation, and Employment

Policy LU 5-1 Locate residences away from areas of excessive noise, smoke, dust, odor, and lighting, and ensure that adequate provisions, including buffers or transitional uses, are made to ensure the health and well-being of existing and future residents.

Policy LU 5-4 Require the design of new residential development to be consistent with the City's design guidelines, to ensure harmony with Sebastopol's unique, small-town character and compatibility with existing land uses.

Policy LU 5-5 Strongly encourage residential development in a balanced and efficient pattern that reduces sprawl, preserves open space, and creates convenient connections to other land uses.

Goal LU 6: Promote a Range of Housing Options to Provide Affordability for Families, Seniors, and Low Income Households, Consistent with the Demographic Profile of the Area

Policy LU 6-1 Promote increased residential densities.

Policy LU 6-3 Encourage and support the construction and occupation of very small houses and micro apartments.

Policy LU 6-4 Provide for a variety of residential products, through the General Plan and Zoning Code, to accommodate the housing needs of all segments of the City's population.

Policy LU 6-2 Promote compact urban form that provides residential opportunities in close proximity to jobs, services, and transit.

City of Sebastopol Municipal Code

The SMC serves as an implementing tool for the General Plan by establishing detailed development regulations and standards in each area of the City. State law mandates that zoning regulations be consistent with the General Plan maps and policies. The Zoning Ordinance can be found in Chapter 17 of the Municipal Code and contains the regulations that pertain to land use in the City. Included in the Zoning Ordinance are the requirements regarding use, density, intensity, setbacks, signs, accessory structures and uses and other land use matters. In addition, SMC Chapter 8.12, *Tree Protection,* establishes regulations for the installation, maintenance, preservation, and selected removal of trees within the City.

4.9.3 Impact Analysis

a. Significance Thresholds and Methodology

Based on Appendix G of the CEQA Guidelines, a land use and planning impact is considered significant if the proposed project would:

1. Physically divide an established community; or
2. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

b. Project Impacts and Mitigation Measures

Threshold 1:	Would the project physically divide an established community?

Impact LU-1 **THE PROJECT WOULD NOT PHYSICALLY DIVIDE AN ESTABLISHED COMMUNITY. NO IMPACT WOULD OCCUR.**

The proposed project would involve construction of a new residential development on a currently undeveloped project site. The project would not separate connected neighborhoods or land uses from each other. Access to the project site would be provided via new internal roadways. The project would include construction of landscaped internal walkways throughout the site, and direct public access to an enhanced 6-foot-wide pedestrian pathway to connect the West County Trail to Gravenstein Highway along the south border of the site.

No new roads, linear infrastructure, or other development features are proposed that would divide an established community or limit movement, travel, or social interaction between established land uses. No impact would occur.

Mitigation Measures

No mitigation measures would be required.

Threshold 2:	Would the project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Impact LU-2 **THE PROJECT WOULD NOT CONFLICT WITH THE GOALS OR POLICIES IN THE CITY'S GENERAL PLAN OR THE SMC. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.**

City of Sebastopol General Plan

The project site is designated as Office/Light Industrial (OLI) in the 2016 City of Sebastopol General Plan. The General Plan OLI designation is intended "to promote well planned, integrated business parks, which will serve as major employment center within the community." Residential uses are allowed at a density of 12.1 to 25 units per acre as a secondary use to the primary office/light industrial uses allowed in this land use designation. Because the project involves residential uses at a density of 13.1 units per acre, the project would be consistent with the OLI designation.

The project would result in a potentially significant impact if it would obstruct the implementation of the goals and policies within the City of Sebastopol General Plan that were adopted for the purpose of avoiding or mitigating an environmental effect. Table 4.9-1 provides an evaluation of project consistency with applicable land use goals and policies.

Table 4.9-1 Project Consistency with the City of Sebastopol General Plan

Measure	Project Consistency
Land Use	
Policy LU 1-2: Avoid urban sprawl by concentrating development within the City limits; favor infill development over annexation. **Policy LU 1-3:** Require new development to occur in a logical and orderly manner, focusing growth on infill locations and areas designated for urbanization on the Land Use Map, and be subject to the ability to provide urban services, including paying for any needed extension of services. **Policy LU 1-8:** Do not allow development in areas not served by municipal utilities.	**Consistent.** The project would be within Sebastopol City Limits and would connect to existing municipal services including water, wastewater, and electricity. The project would be consistent with the OLI designation indicated on the Land Use Map with approval of a Conditional Use Permit.
Policy LU 1-7: Encourage new development to be contiguous to existing development, whenever possible.	**Consistent.** As discussed in Section 4.9.1, *Environmental Setting*, the project site is in a neighborhood characterized by a mix of uses including residential, educational, commercial, and recreational. The existing O'Reilly Media Center directly abuts the site to the west, schools and residential uses are located north of the site, neighborhoods and the West County Trail are located east of the site, and commercial and residential uses are located south of the project site.
Policy LU 5-1: Locate residences away from areas of excessive noise, smoke, dust, odor, and lighting, and ensure that adequate provisions, including buffers or transitional uses, are made to ensure the health and well-being of existing and future residents.	**Consistent.** Refer to Sections 4.2, *Air Quality*, 4.11, *Aesthetics,* and 4.10, *Noise*. The proposed project would not generate objectionable odors affecting a substantial number of people. The project would be required to implement Mitigation Measure AES-4 to reduce impacts regarding outdoor lighting. Mitigation Measure NOI-1 would reduce project operational stationary noise impacts.
Policy LU 5-4: Require the design of new residential development to be consistent with the City's design guidelines, to ensure harmony with Sebastopol's unique, small-town character and compatibility with existing land uses.	**Consistent.** Pursuant to SMC Chapter 17.450, project design would undergo review by the Design Review Board to ensure consistency with neighborhood character.
Policy LU 5-5: Strongly encourage residential development in a balanced and efficient pattern that reduces sprawl, preserves open space, and creates convenient connections to other land uses.	**Consistent.** As discussed in Section 4.9.1, *Environmental Setting*, the project site is in a neighborhood characterized by a mix of uses including residential, educational, commercial, and recreational. The project includes direct public access to a new, enhanced pedestrian pathway connecting Gravenstein Highway to the West County Trail.

Measure	Project Consistency
Policy LU 6-1: Promote increased residential densities. **Policy LU 6-3:** Encourage and support the construction and occupation of very small houses and micro apartments. **Policy LU 6-4:** Provide for a variety of residential products, through the General Plan and Zoning Code, to accommodate the housing needs of all segments of the City's population.	**Consistent.** The project would have a residential density of 13.1 units per acre and include diverse residential uses, including accessible ground-floor ADUs, that add diversity to the City of Sebastopol's ownership housing supply and meet a variety of residents' needs by encouraging inherent affordability and providing housing opportunities for households at a variety of income levels and life stages. The project would include accessible and adaptable features in every building to provide ADA accessibility beyond what is required by the building code.
Policy LU 6-2: Promote compact urban form that provides residential opportunities in close proximity to jobs, services, and transit.	**Consistent.** The project site is within Sebastopol City limits and in a neighborhood characterized by a mix of uses including residential, educational, commercial, and recreational. Private internal streets would provide access to Gravenstein Highway North, and internal walkways would connect to the West County trail. There are four public transit stops within 0.5 miles of the project site.
Circulation	
Policy CIR 2-14: Provide secure bicycle racks in places such as the Downtown, at commercial areas, park and ride transit facilities, schools, multiple unit residential developments, and other locations where there is a concentration of residents, visitors, students, or employees.	**Consistent.** The project would include 96 bicycle parking spaces (80 in garages and 16 in on-site bicycle racks).
Policy CIR 2-15: Ensure that all crossings where trails and roads meet include best practices for crossing design for these conflict points.	**Consistent.** Refer to Section 4.13, *Transportation*. Mitigation Measure TRA-1 requires a new pedestrian path to be added through the center of the project site in order to link the project and mixed commercial office park to the new HAWK (Pedestrian Hybrid Beacon) crossing across the north leg of the intersection of SR 116/Danmar Drive after Caltrans constructs the HAWK crossing and before an occupancy permit is issued.
Policy CIR 3-3: Prioritize high-density and mixed land use patterns that promote transit and pedestrian travel along transit corridors.	**Consistent.** The proposed project would include construction of 80 solar all-electric, three-story townhome-style condominiums, with the potential for up to 16 ADA-accessible ADUs. The proposed project would be located within a half mile of SCT Routes 20, 24, and 26, and would be located in proximity to several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County Trail and existing bicycle lanes along SR 116 between Occidental Road to the north and the southern city limits at Lynch Road, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116. The proposed project would also include a new, enhanced 6-foot-wide pedestrian pathway with public access to connect the West County Trail to Gravenstein Highway, 96 bicycle parking spaces, and a bicycle repair station to promote transit and pedestrian and bicycle travel.

Measure	Project Consistency
Policy CIR 3-4: Design developments to include features that encourage walking, bicycling, and transit use. Design features shall include bus turnouts, transit shelters and benches, and pedestrian access points between subdivisions and between adjacent related land uses.	**Consistent.** The proposed project would include a new, enhanced 6-foot-wide pedestrian pathway with public access to connect the West County Trail to Gravenstein Highway, 96 bicycle parking spaces, and a bicycle repair station to encourage walking and the use of bicycles.
Policy CIR 4-2: Require new development to contribute its proportional cost of circulation improvements necessary to address cumulative transportation impacts on roadways throughout the city, as well as the bicycle and pedestrian network.	**Consistent.** The project would be required to pay traffic impact fees or construct facilities pursuant to SMC Chapter 3.36.
Community Services and Facilities	
Policy CSF 2-2: Ensure park and trail facilities are accessible to various segments of the population including: specific age groups, persons with special physical requirements, and groups interested in particular activities. **Policy CSF 2-4:** Encourage and support the development of an integrated trails and routes network extending and connecting local and regional trails and routes to schools, open space areas, park and recreation facilities, and residential areas to serve both recreational and utilitarian travel.	**Consistent.** The project would include 107,200 square feet of common open space and construction of landscaped internal walkways throughout the site, including direct access to a new pedestrian pathway connecting the West County Trail to Gravenstein Highway along the south border of the site. The project would include units with accessible and adaptable features in every building, and an accessible path of travel will connect all buildings. The project would be required to pay park impact fees or construct facilities pursuant to SMC Chapter 3.32.
Policy CSF 2-5: Preserve and enhance public access through new and existing development to facilitate access to the local trail network. **Policy CSF 2-13:** Require major new development to provide direct pedestrian connections, such as sidewalks, trails and other rights-of-way improvements to the existing and planned network of parks and trails, wherever feasible and appropriate. For smaller development projects, the City shall explore and pursue partnership opportunities to provide cost-effective connections.	**Consistent.** The project would include direct public access to a new, enhanced pedestrian pathway connecting Gravenstein Highway to the West County Trail. Additionally, Mitigation Measure TRA-1 requires a new pedestrian path to be added through the center of the project site in order to link the project and mixed commercial office park to the new HAWK (Pedestrian Hybrid Beacon) crossing across the north leg of the intersection of SR 116/Danmar Drive after Caltrans constructs the HAWK crossing and before an occupancy permit is issued.
Policy CSF 5-4: Ensure that new development is served with adequate water volumes and water pressure for fire protection.	**Consistent.** As discussed in Section 4.15, *Utilities and Service Systems*, the City adopted a Water Supply Contingency Plan in June 2023 that seeks to conserve the available water supply and protect the integrity of public water system supply facilities, with particular regard for fire protection, to protect and preserve public health, welfare, and safety.
Policy CSF 6-14: Consider the needs of seniors and people with disabilities when reviewing future development applications and land use plans.	**Consistent.** The project will have units with accessible and adaptable features in every building, and an accessible path of travel will connect all buildings. Select for-sale homes will have the option for personal elevators and will provide additional ADA accessibility beyond what is required by the building code.
Conservation and Open Space	
Policy COS 2-1: Protect and enhance sensitive habitats, which include creek corridors, wetlands, vernal pools, riparian areas, wildlife and fish migration corridors, native plant nursery sites, waters of the United States, sensitive natural communities, and other habitats designated by State and Federal agencies.	**Consistent.** As discussed in Section 4.3, *Biological Resources*, no sensitive natural communities or wetlands are present on the project site. No adverse effect on sensitive natural communities or wetlands would occur as a result of project activities.

Measure	Project Consistency
Policy COS 2-2: Preserve and enhance Sebastopol's and the region's natural habitats and rich biodiversity including, but not limited to, grasslands, freshwater marshes, wetlands, vernal pools, riparian areas, aquatic habitat, oak woodlands, and agricultural lands. **Policy COS 2-6:** Maintain Zoning Ordinance provisions to ensure that development proposals for land which is located within, or adjacent to, an environmentally sensitive area include a resources analysis that contains all of the information required in order for the City to determine that impacts to sensitive habitat and natural resources have been reduced, avoided, or mitigated to the greatest extent feasible. The required content for the resources analysis is detailed in Action COS-2a.	
Policy COS 3-6: Require the use and site design integration of natural features such as bioswales, vegetation, retention ponds, and other measures to remove surface water pollutants prior to discharge into surface waters. **Policy COS 3-11:** Where feasible, for major development or substantial public works projects, encourage and support multipurpose detention basins that provide water quality protection, storm water detention, open space amenities, and recreational amenities.	**Consistent.** The proposed project design includes bioretention swales, a bioretention facility, modifications to the adjacent office park detention pond, and vegetated buffer zones.
Policy COS 6-1: Conserve existing native vegetation where possible and integrate regionally native plant species into development and infrastructure projects where appropriate. **Policy COS 6-2:** Require the use of primarily locally-sourced native and drought-tolerant plants and trees for landscaping on public projects, if feasible, and strongly encourage their use for landscaping on private projects.	**Consistent.** The project applicant would be required to comply with the Sebastopol Municipal Code Chapter 8.12, *Tree Protection*, which would include a review of tree removal plans, landscape plans, and specification of a tree replacement ratio by the Planning staff or the City Arborist during the project design review. Pending approval, removed trees must be replaced with an approved tree species on the approved tree List.
Policy COS 6-3: Avoid removal of large, mature trees that provide wildlife habitat or contribute to the visual quality of the environment through appropriate project design and building siting. If full avoidance is not possible, prioritize planting of replacement trees on-site over off-site locations. Replacement trees for high-quality mature trees should generally be of like kind, and provide for comparable habitat functionality, where appropriate site conditions exist. **Policy COS 6-4:** Facilitate the preservation of existing trees, the planting of additional street trees, and the replanting of trees lost through disease, new construction or by other means. **Policy COS 6-5:** Require new development to incorporate trees in landscape plans.	**Consistent.** As discussed in Section 4.3, *Biological Resources,* existing oak trees and redwoods would be preserved to the maximum extent possible. The project applicant would be required to comply with the SMC Chapter 8.12, Tree Protection, which would include a review of tree removal plans, landscape plans, and specification of a tree replacement ratio by the Planning staff or the City Arborist during the project design review. Mitigation measure BIO-2 would require compliance with the Sebastopol Municipal Code Section 8.12.

Measure	Project Consistency
Policy COS 7-2: Minimize exposure of sensitive receptors to concentrations of air pollutant emissions and toxic air contaminants. **Policy COS 7-4:** Continue to cooperate with the Bay Area Air Quality Management District (BAAQMD) in implementing the regional Clean Air Plan. **Policy COS 7-5:** Continue to enforce air quality standards in collaboration with the BAAQMD. **Policy COS 7-6:** Require new development or significant remodels to install fireplaces, stoves, and/or heaters which meet current BAAQMD standards and the standards established in Chapter 15.70 of the SMC. **Policy COS 7-7:** Continue to require all construction projects and ground disturbing activities to implement BAAQMD dust control and abatement measures.	**Consistent.** Refer to Section 4.4, *Air Quality*. The project would not result in exceedances of BAAQMD thresholds for criteria air pollutants and thus would not conflict with the 2017 Clean Air Plan goal to attain air quality standards. With the incorporation of Mitigation Measure AQ-1 construction activities would not expose sensitive receptors to substantial toxic air contaminant concentrations. Mitigation Measure AQ-1 would also require the City Engineer and the Chief Building Official monitoring staff to monitor requirements of the construction emissions reduction measures and promptly investigate and respond to fugitive dust and toxic air complaints. The project would not include natural gas appliances or natural gas plumbing, and no wood burning appliances are proposed.
Policy COS 7-3: Implement the portfolio of policies and programs contained in the Circulation Element to reduce vehicle trips, vehicle miles travelled, and increase the use of non-vehicular modes of transportation such as bicycling, walking, and the use of shared transit. **Policy COS 8-5:** Encourage public transit, ridesharing and van pooling, shortened and combined motor vehicle trips to work and services, use of bicycles, and walking. Minimize single passenger motor vehicle use.	**Consistent**. The proposed project would include a new, enhanced 6-foot-wide pedestrian pathway with public access to connect the West County Trail to Gravenstein Highway, 96 bicycle parking spaces, and a bicycle repair station to facilitate pedestrian and bicycle transportation and reduce the use of gasoline vehicles. The proposed project would also be located in proximity to several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County- Trail and existing bicycle lanes along SR 116 between the Occidental Road to the southern city limit at Lynch Road, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116 which would encourage future residents to bicycle.
Policy COS 9-1: Require all new public and privately constructed buildings to meet and comply with CALGreen Tier 1, or successor program, standards. **Policy COS 9-2:** Make energy conservation an important criterion in the development review process. **Policy COS 9-3:** Support innovative and green building best management practices including, but not limited to, LEED certification for new development, and encourage project applicants to exceed the most current "green" development standards in the California Code of Regulations (CCR), Title 24, if feasible. **Policy COS 9-4:** Encourage publicly-constructed projects to exceed CalGreen Tier 1, or successor program, standards.	**Consistent.** According to information from the project applicant, the project is anticipated to exceed California Building Energy Efficiency Standards by five to ten percent. The project would be all electric and include solar panels, ultra-low flow water fixtures, low-impact landscaping and energy star appliances.
Policy COS 9-5: Promote the use of sustainable and carbon-neutral energy sources in new development. **Policy COS 9-6:** Promote regional efforts and partnerships, such as Sonoma Clean Power, to increase opportunities for residential and business customers across the county to access environmentally friendly power generated by renewable sources (like solar, wind, and geothermal) at competitive rates.	**Consistent.** As discussed in Section 4.16.2, *Energy*, the project would utilize renewable electricity through the use of solar panels, and homeowners would have the option to opt into the Sonoma Clean Power (SCP) program, which provides residents and businesses in Sonoma and Mendocino counties with clean energy from more renewable resources, such as geothermal, wind, and solar.

Measure	Project Consistency
Policy COS 9-7: Promote efforts and programs, including increased access to clean technologies such as electric vehicles and charging stations, to encourage residents, businesses, and local organizations to use clean energy sources to supplant dirty technologies. **Policy COS 9-8:** Incorporate innovative green building techniques and best management practices in the site design, construction, and renovation of all public projects.	**Consistent.** The project would include pre-wiring for electric vehicles in all garages and 10 percent of onsite surface parking spaces. All units would be all-electric and include solar.
Policy COS 9-9: Promote water conservation among water users. **Policy COS 9-10:** Continue to require new development to incorporate water efficient fixtures into design and construction.	**Consistent.** The proposed project also includes water-conserving features. As described in Section 2, *Project Description*, future residences would include water-efficient appliances and water-efficient landscaping.
Policy COS 9-11: Promote the use of reclaimed water and other non-potable water sources. **Policy COS 9-12:** Encourage and support the installation and use of rainwater catchment systems and grey water systems on private land and in public projects.	**Consistent.** Refer to Section 4.8, *Hydrology and Water Quality*. As described therein, runoff from impervious surfaces would be retained in retention basins and recharged on site. Additionally, runoff from all proposed impervious surfaces would be directed toward the proposed vegetated buffer strips and the existing detention pond that has enough retention capacity to meet the hydromodification requirement of 100 percent volume capture.
Policy COS 9-13: Continue the citywide recycling program, actively encourage recycling citywide, including the recycling/composting of food waste, and advocate for a regional composting facility.	**Consistent.** The proposed project would be consistent with the AB 341 waste diversion goal of 75 percent and would be required to recycle organic wastes pursuant to SB 1383.
Policy COS 10-1: Review proposed developments and work in conjunction with the California Historical Resources Information System, Northwest Information Center (NWIC) at Sonoma State University, to determine whether project areas contain known archaeological resources, either prehistoric and/or historic-era, or have the potential for such resources.	**Consistent.** Refer to Section 4.4, *Cultural Resources*, which includes determinations that the project does not contain known archaeological resources.
Policy COS 10-2: If found during construction, ensure that human remains are treated with sensitivity and dignity, and ensure compliance with the provisions of California Health and Safety Code and California Public Resources Code.	**Consistent.** Refer to Section 4.4, *Cultural Resources,* regarding the potential for human remains on-site.
Policy COS 10-3: Work with Native American representatives to identify and appropriately address, through avoidance or mitigation, impacts to Native American cultural resources and sacred sites during the development review process. **Policy COS 10-4:** Consistent with State local and tribal intergovernmental consultation requirements, the City shall consult with Native American tribes that may be interested in proposed new development and land use policy changes.	**Consistent.** Refer to Section 4.14, *Tribal Cultural Resources* regarding the Native American consultation that occurred for the project.

Measure	Project Consistency
Policy COS 11-7: Restrict outdoor light and glare from development projects to retain the quality of night skies by minimizing light pollution. **Policy COS 11-8:** All outdoor lighting shall be constructed with full shielding and/or recessed to reduce light trespass to adjoining properties and to reduce illumination of the night sky. Each fixture shall be directed downward and away from adjoining properties and public rights-of-way, so that no light fixture directly illuminates an area outside of the site.	**Consistent.** Refer to Section 4.11, *Aesthetics,* while there are no municipal code requirements that implement the General Plan policies related to outdoor lighting, or the design guidelines related to site lighting, the project would be required to implement Mitigation Measure AES-4 to reduce impacts.
Policy COS 12-2: Preserve open space for conservation, recreation, and agricultural uses in order to enhance the quality of life and the quality of the environment in Sebastopol. **Policy COS 12-4:** Where possible, integrate open space and stream corridors with trails and other recreational open space in an environmentally sustainable manner that provides opportunities for public access and enjoyment, without compromising or threatening ecological protection efforts. **Policy COS 12-7:** Encourage public and private efforts to preserve open space. **Policy COS 12-8:** Common or private open space that is not City property shall be privately maintained. **Policy COS 12-10:** Facilitate public access to open space and environmentally sensitive areas in a manner that ensures protection of biotic resources. **Policy COS 12-11:** Require usable open space for residential and major commercial developments. **Policy COS 12-12:** Encourage clustered development that preserves a sense of openness, particularly in areas adjacent to open spaces and scenic resources.	**Consistent.** The proposed project includes 107,200 square feet (2.46 acres) of common open space and construction of landscaped internal walkways throughout the site, including a new pedestrian pathway to connect the West County Trail to Gravenstein Highway along the south border of the site. Existing oak trees and redwoods would be preserved throughout the site. Additional trees, such as native maples, madrone and dogwood, are proposed to create onsite ecosystems that attract birds and butterflies. Proposed landscaping would include new plantings throughout the open spaces, including the paseo, at the setbacks along drive aisles, roadways, and streets, and surrounding the proposed buildings. Other amenities, including gardens, active and passive seating areas, children's play areas, and a meditation hammock garden are also proposed.
Policy COS 12-3: Conversion of open space, as defined under Policy COS 12-1, to developed residential, commercial, industrial, or other similar types of uses, shall be prohibited. Undeveloped land that is designated for urban uses may be developed, if the proposed development is consistent with the General Plan Land Use Map and has undergone environmental review.	**Consistent.** The project site is undeveloped land designated for as Office/Light Industrial (OLI) in the 2016 City of Sebastopol General Plan. Residential uses are allowed at a density of 12.1 to 25 units per acre as a secondary use to the primary office/light industrial uses allowed in this land use designation. Development of residential as the primary or only use on a parcel with this designation is allowed with approval of a Conditional Use Permit.
Policy COS 12-9: Encourage the protection and incorporation of existing, native, mature, nonorchard trees and areas of natural vegetation as part of new development.	**Consistent.** As discussed in Section 4.3, *Biological Resources,* existing oak trees and redwoods would be preserved to the maximum extent possible. The project applicant would be required to comply with the SMC Chapter 8.12, Tree Protection, which would include a review of tree removal plans, landscape plans, and specification of a tree replacement ratio by the Planning staff or the City Arborist during the project design review.

Measure	Project Consistency
Noise	
Policy N 1-2: Require development and infrastructure projects to be consistent with the Land Use Compatibility for Community Noise Environments standards indicated in Table N-1 to ensure acceptable noise levels for existing and future development. **Policy N 1-3:** Require new development to mitigate excessive noise through best practices, including building location and orientation, building design features, placement of noise generating equipment away from sensitive receptors, shielding of noise-generating equipment, placement of noise-tolerant features between noise sources and sensitive receptors, and use of noise-reducing materials. **Policy N 1-6:** Require acoustical studies for new developments, projects seeking use permits related to activities that would increase noise levels, and transportation improvements that affect noise-sensitive uses such as schools, hospitals, libraries, group care facilities, convalescent homes, and residential areas. **Policy N 1-14:** Ensure that new development does not result in indoor noise levels exceeding 45 dBA Ldn for residential uses.	**Consistent.** Refer to Section 4.10, *Noise.* Mitigation Measure NOI-1 would reduce project operational stationary noise impacts.
Policy N 1-15: Require construction activities to comply with standard best practices (see Action N 1f). **Policy N 1-16:** Require new development to minimize vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, a vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to the building. A vibration limit of 0.30 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction.	**Consistent.** Refer to Section 4.10, *Noise.* Construction noise levels would not exceed the FTA construction noise threshold of 80 dBA L_{eq} at residential receptors and the project would include the implementation of Action N1f from the Sebastopol General Plan. Vibration levels from project construction activities would not exceed the significance threshold of 0.3 in/sec PPV at the nearest off-site building.
Community Design	
Policy CD 1-1: Ensure that new development is constructed in a manner consistent with the City's Design Guidelines, and any design guidelines for specific areas or types of development. **Policy CD 1-2:** Ensure that new residential and commercial development is sensitive to the surrounding architecture, topography, landscaping, character, scale, and ambiance of the surrounding neighborhood. **Policy CD 1-3:** Discourage repetitive designs in residential and commercial areas, while establishing a cohesive visual relationship between structures and their surroundings. **Policy CD 1-12**: Require the design of new residential development to be consistent with the City's design guidelines, to ensure that new development contributes to the small town character of Sebastopol.	**Consistent.** Implementation of Sebastopol Design Guidelines and compliance with SMC Chapter 17.450 which requires Design Review of the proposed project prior to approval, and Chapter 16.40 would ensure that development would be consistent with design guidelines through design review and would ensure that the project would be consistent with existing surrounding development.

Measure	Project Consistency
Policy CD 1-7: Promote a compact urban form and infill development with increased densities to be located in areas that are readily accessible by pedestrians and bicyclists, served by transit, and allow for convenient access to daily services. **Policy CD 1-11:** Encourage and support the inclusion of public and quasi-public spaces in new developments by offering incentives such as increased densities or decreased height/setback restrictions, where feasible and compatible with the surrounding neighborhoods.	**Consistent.** The project would be within Sebastopol City Limits and would connect to existing municipal services. The project would include direct public access to a new, enhanced pedestrian pathway connecting Gravenstein Highway to the West County Trail. The project would require approval of a State Density Bonus law waiver to increase building height from two stories to three stories.
Policy CD 3-4: Require new development to avoid the disruption of cultural, archeological, and historical resources to the greatest extent feasible.	**Consistent.** Refer to Section 4.4, *Cultural Resources*, which includes determinations that the project does not contain known archaeological or historic resources.
Safety	
Policy SA 1-3: Discourage construction of high density residential and other critical, high-occupancy or essential services buildings in areas with high seismic and/or geologic hazards, including high potential for shrinkswell, liquefaction, and landslides. **Policy SA 1-5:** Where feasible, require new development to avoid unreasonable exposure to geologic hazards, including earthquake damage, subsidence, liquefaction, and expansive soils. **Policy SA 1-7:** All structures and building foundations located within areas containing expansive soils shall be designed and engineered to comply with the most current version of the California Code of Regulations (CCR), Title 24.	**Consistent.** Refer to Section 4.5, *Geology and Soils*. The project site is in a seismically active area. SMC Chapter 16.40 requires that all recommendations included in the Geotechnical Investigation be incorporated into the design of the project and each of the proposed residences. Incorporation of the design features related to liquefaction and soil stability recommended in the Geotechnical Investigation would reduce impacts.
Policy SA 2-8: Require all development projects to demonstrate how storm water runoff will be detained or retained on-site, treated, and/or conveyed to the nearest drainage facility as part of the development review process. Project applicants shall demonstrate that project implementation would not result in increases in the peak flow runoff to adjacent lands or drainage facilities that would exceed the design capacity of the drainage facility or result in an increased potential for offsite flooding.	**Consistent.** Refer to Section 4.8, *Hydrology and Water Quality* and Appendix H. As part of the project, an existing detention pond for the adjacent office park and its inlet and overflow structures would be modified to detain and control drainage from the office park and project site in order to not exceed preconstruction drainage levels. Runoff from impervious surfaces would drain through the onsite bioretention facilities and storm drain network before discharging to the existing storm drain network of the office park. The project would not result in stormwater runoff that would exceed existing or planned off-site stormwater drainage systems.
Policy SA 2-9: Prohibit development in the 100-year flood zone unless requirements of the City's Flood Damage Protection Ordinance criteria are met.	**Consistent.** Refer to Section 4.8, *Hydrology and Water Quality*. According to maps from the Federal Emergency Management Agency (FEMA), the project site is not located within a flood zone (Map #06097C0715E, effective December 2, 2008).

Measure	Project Consistency
Policy SA 4-1: Review all development proposals for fire risk and require mitigation measures to reduce the probability of fire. **Policy SA 4-2:** Continue to enforce the California Building and Fire Standards Codes for all new construction and renovation and when occupancy or use changes occur.	**Consistent.** As discussed in section 4.12, *Public Services*, the project would be required to meet the standard fire code safety and access requirements administered by the City of Sebastopol Building and Safety Department and specified by the CBC. In accordance with standard practices, Sebastopol Fire Department (SVFD) would review project plans before permits are issued to ensure compliance with all applicable fire and building code standards and ensure adequate emergency access is provided to the site. In addition, the project would be required to pay impact fees as detailed in Chapter 3.34 of the SMC for the provision of resources for the SVFD.
Policy SA 5-2: Review development proposals for their demand for police services and implement mitigating measures to maintain the current high standard for police services.	**Consistent.** As discussed in section 4.12, *Public Services*, the addition of new residents may increase the number and frequency of calls to the police department. The project would be required to pay impact fees pursuant to Chapter 3.38 of the SMC for the provision of additional supplies and staff at the police station.
Policy SA 6-1: Require measures to protect the public health from the hazards associated with the transportation, storage and disposal of hazardous wastes (TSD Facilities).	**Consistent.** Refer to Section 4.7, *Hazardous Materials*. Any use and transport of hazardous materials, such as solvents or construction fuels, would comply with all local, State, and federal regulations regarding the handling of potentially hazardous materials, as discussed under the Regulatory Setting, in Section 4.7. Hazardous materials would be transported by DTSC-registered transporters and be required to follow all U.S. DOT regulations under the Hazardous Materials Transport Act, in addition to CalEPA and local CUPA regulations regarding hazardous materials transport. Mitigation Measures HAZ-3a and HAZ-3b would be required reduce potential hazardous material impacts.
New Housing Production	
Policy C-4: The City will encourage development of new housing to meet a range of income levels, including market-rate housing, and a variety of housing sizes and types.	**Consistent.** The project would include diverse residential uses, including accessible ground-floor ADUs, that add diversity to the City of Sebastopol's ownership housing supply and meet a variety of residents' needs by encouraging inherent affordability and providing housing opportunities for households at a variety of income levels and life stages. The project would include accessible and adaptable features in every building to provide ADA accessibility beyond what is required by the building code.
Source: City of Sebastopol 2016	

As shown in Table 4.9-1, the project would be generally consistent with the applicable goals and policies in the Sebastopol General Plan. Therefore, the project would not conflict with the Sebastopol General Plan.

City of Sebastopol Municipal Code

As discussed above in *Setting*, the purpose of the OLM District is to implement the “Office/Light Industrial” land use category of the General Plan and to provide areas for well-planned, integrated business parks that may include office and related uses. Section 17.25.020 of SMC lists the allowed uses of the OLM district which includes R7-Multifamily Residential (12.1-25 du/ac) with Planning Commission review.

The purpose of the R7 District is to implement the "High Density Residential" land use category of the General Plan. This district is applicable to those lands within that category which are appropriate for densities from approximately 12.1 to 25 units per acre. Some of the permitted uses in the R7 district include accessory dwelling (ADU), single-family dwelling (attached), two-family dwelling, multi-family dwelling, community garden, and community park.

The project would require the City's approval of a Conditional Use Permit for 80 townhouse units within the OLM zoning district, site development review, and a Vesting Tentative Map. In addition, the project applicant proposes the use of a State Density Bonus to allow for a waiver to increase the building height to three stories.

The project would be consistent with the uses and development standards allowed within the R7 district with the requested waiver for building height. Table 4.9-2 shows the project's consistency with SMC R7 development standards. The project would be consistent with the land use and zoning designations and would not conflict with the General Plan or Municipal Code.

Table 4.9-2 Project Consistency with SMC R7 Development Standards

Project Characteristics	R7 Requirements[1]	Proposed by Project	Project Compliance with R7 Requirements
Maximum Residential Density	25 DU/acre	13.1 DU/acre	Complies
Minimum Residential Density	12.1 DU/acre	13.1 DU/acre	Complies
Maximum lot coverage	40%[2]	26%	Complies
Building Height	30 ft, 2 stories (maximum)	40 feet +/- and 3 stories	Density bonus waiver of maximum building height required
Detached Accessory Building Height	17 ft.(maximum)	n/a	
Deed restricted affordable housing	40 ft., 3 stories (maximum)	n/a	
Open Space	50 square feet/dwelling unit (minimum)	107,200 square feet (1,340 square feet/dwelling unit)	Complies
Setbacks	**R7 Requirements**	**Proposed by Project**	
Interior Side Yard	10% of lot width, or 5 ft., whichever is greater, not to exceed 9 ft.	9'	Complies
Front Yard	10'	10'	Complies
Rear Yard	20% of the lot depth, no less than 20 ft. nor greater than 25 ft.	20-25'	Complies

Parking	R7 Requirements	Proposed by Project	
Parking Spaces	218 (0) Required for Accessory Dwelling Units (22) 3 bedroom x 2 spaces = 44 spaces (58) 4 bedroom x 3 spaces = 174 spaces	218 spaces	Complies
Garage Parking	–	160 spaces (2 per residential unit)	
Surface Parking	–	41 spaces	
Compact Surface Parking	Up to 40% of parking	17 spaces	Complies
Electric Vehicle Pre-wire per CalGreen	15% of onsite surface parking (24 spaces)	160	Complies with incorporation of Mitigation Measure GHG-1
Bicycle Parking Spaces	.5 spaces per unit (40 spaces)	96 spaces	Complies

[1] Per SMC Section 17.20.030, development standards for the R7 district.

[2] The Planning Commission may approve up to a 10 percent increase in the allowable lot coverage where it is found that sufficient open spaces and recreation areas can be provided through efficient and well-organized use of the land or where it is necessary to promote an affordable housing project.

Mitigation Measures

No mitigation measures would be required.

c. Cumulative Impacts

All other pending and future projects in Sebastopol would be required to adhere to the City zoning and development regulations and General Plan policies to mitigate environmental impacts where feasible. In addition, all pending and future projects would be reviewed for consistency with the Sebastopol General Plan and all other applicable regulatory land use actions prior to approval. Therefore, it is not anticipated that a cumulative land use and planning impact would occur. The proposed project would not result in significant cumulative impacts with respect to consistency with land use plans. Impacts would not be cumulatively considerable.

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4.10 Noise

This section analyzes the project's potential noise impacts. The analysis contains a description of the existing noise setting, regulatory setting, a discussion of both the temporary noise and vibration impacts related to construction activity and long-term impacts associated with project operations, and mitigation measures to reduce project noise and vibration impacts. The findings of this section are based in part on The Canopy Environmental Noise Assessment prepared by Veneklasen Associates (Appendix I).

4.10.1 Setting

a. Fundamentals of Noise

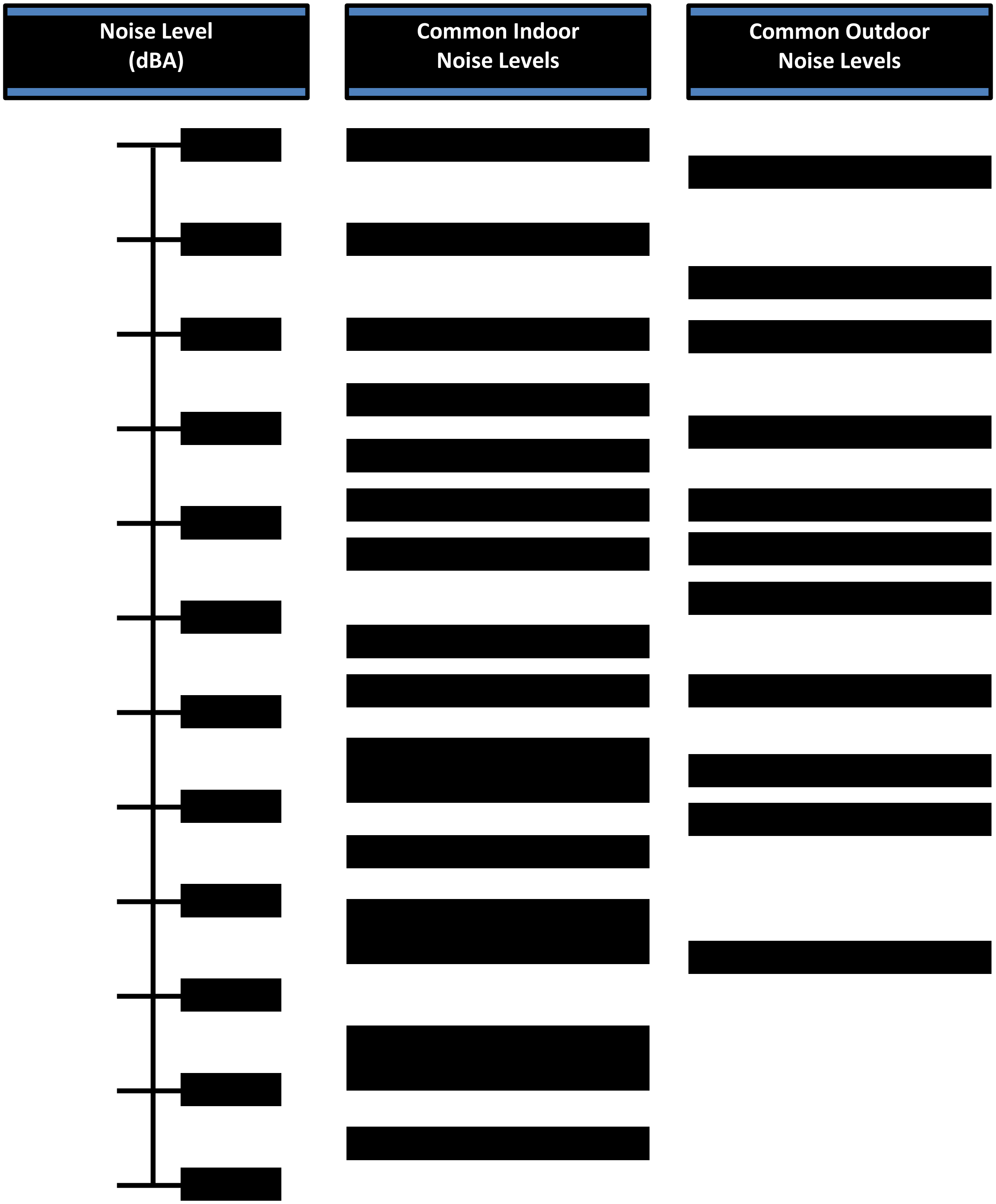
Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs (e.g., the human ear). Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (California Department of Transportation [Caltrans] 2013).

Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response, which is most sensitive to frequencies around 4,000 Hertz (Hz) and less sensitive to frequencies around and below 100 Hz (Kinsler, et. al. 1999). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used to measure earthquake magnitudes. A doubling of the energy of a noise source, such as a doubling of traffic volume, would increase the noise level by 3 dBA; similarly, dividing the energy in half would result in a decrease of 3 dBA (Crocker 2007). Common outdoor and indoor noise sources and their typical corresponding A-weighted noise levels are shown in Figure 4.10-1.

Human perception of noise has no simple correlation with sound energy. The perception of sound is not linear in terms of dBA or in terms of sound energy. Two sources do not "sound twice as loud" as one source. It is widely accepted that the average healthy ear can barely perceive an increase (or decrease) of up to 3 dBA in noise levels (i.e., twice [or half] the sound energy); that a change of 5 dBA is readily perceptible; and that an increase (or decrease) of 10 dBA sounds twice (or half) as loud (Crocker 2007).

Sound changes in both level and frequency spectrum as it travels from the source to the receiver. The most obvious change is the decrease in sound level as the distance from the source increases. The manner by which noise declines with distance depends on factors such as the type of sources (e.g., point or line), the path the sound will travel, site conditions, and obstructions. Noise levels from a point source (e.g., construction, industrial machinery, ventilation units) typically attenuate, or drop off, at a rate of 6 dBA per doubling of distance. Noise from a line source (e.g., roadway, pipeline, railroad) typically attenuates at about 3 dBA per doubling of distance (Caltrans 2013). The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site, such as a parking lot or smooth body of water, receives no additional ground attenuation and the changes in noise levels with distance (drop-off rate) result simply from the geometric spreading

Figure 4.10-1 Examples of Typical Noise Levels



Source: Caltrans 2013

of the source. An additional ground attenuation value of 1.5 dBA per doubling of distance applies to a soft site (e.g., soft dirt, grass, or scattered bushes and trees) (Caltrans 2013).

Noise levels may also be reduced by intervening structures. The amount of attenuation provided by this "shielding" depends on the size of the object and the frequencies of the noise levels. Natural terrain features, such as hills and dense woods, and man-made features, such as buildings and walls, can alter noise levels. Generally, any large structure blocking the line of sight will provide at least a 5 dBA reduction in source noise levels at the receiver (Federal Highway Administration [FHWA] 2011). Structures can substantially reduce occupants' exposure to noise as well. The FHWA's guidelines indicate that modern building construction generally provides an exterior-to-interior noise level reduction of 20 to 35 dBA with closed windows.

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b. Descriptors

The impact of noise is not a function of loudness alone. The time of day when noise occurs, its frequency, and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors have been developed.

One of the most frequently used noise metrics that considers both duration and intensity is the equivalent noise level (L_{eq}). The L_{eq} is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time. Typically, L_{eq} is equivalent to a one-hour period, even when measured for shorter durations as the noise level of a 10- to 30-minute period would be the same as the hour if the noise source is relatively steady. L_{max} is the highest Root Mean Squared (RMS) sound pressure level within the sampling period, and L_{min} is the lowest RMS sound pressure level within the measuring period (Crocker 2007). Normal conversational levels at three feet are in the 60- to 65-dBA L_{eq} range and ambient noise levels greater than 65 dBA L_{eq} can interrupt conversations (Federal Transit Administration [FTA] 2018).

Noise that occurs at night tends to be more disturbing than that which occurs during the day. Community noise is usually measured using Day-Night Average Level (L_{dn} or DNL), which is a 24-hour average noise level with a +10 dBA penalty for noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours, or Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a +5 dBA penalty for noise occurring from 7:00 p.m. to 10:00 p.m. and a +10 dBA penalty for noise occurring from 10:00 p.m. to 7:00 a.m. (Caltrans 2013). Noise levels described by DNL and CNEL usually differ by about 0.5 dBA. Quiet suburban areas typically have a CNEL in the range of 40 to 50 dBA, while areas near arterial streets are typically in the 50 to 70+ CNEL range.

c. Overview of Groundborne Vibration

Groundborne vibration of concern in environmental analysis consists of the oscillatory waves that move from a source through the ground to adjacent structures. The number of cycles per second of oscillation makes up the vibration frequency, described in terms of Hertz. The frequency of a vibrating object describes how rapidly it oscillates. The normal frequency range of most groundborne vibration that can be felt by the human body is from a low of less than 1 Hertz up to a high of about 200 Hertz (Crocker 2007). Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration.

While people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low-frequency vibration. Vibration in buildings, such as from nearby construction activities, may cause windows, items on shelves, and pictures on walls to rattle. Vibration of building components can also take the form of an audible low-frequency rumbling noise, referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hertz), or when foundations or utilities, such as sewer and water pipes, physically connect the structure and the vibration source (FTA 2018).

Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source. High-frequency vibrations diminish much more rapidly than low frequencies, so low frequencies tend to dominate the spectrum at large distances from the source. Discontinuities in the soil strata can also cause diffractions or channeling effects that affect the propagation of vibration over long distances (Caltrans 2020). When a building is impacted by vibration, a ground-to-foundation coupling loss will usually reduce the overall vibration level. However, under rare circumstances, the ground-to-foundation coupling may amplify the vibration level due to structural resonances of the floors and walls.

Vibration amplitudes are usually described in terms of the peak particle velocity (PPV). PPV, measured in inches per second, is the maximum instantaneous peak of the vibration signal. PPV is appropriate for evaluating potential building architectural damage (Caltrans 2020).

d. Existing Conditions

Sensitive Receptors

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. Sensitive receptors are defined as places where noise could interfere with regular activities such as sleeping, talking, and recreating, which include hospitals, residences, convalescent homes, schools, churches, libraries, parks, and religious institutions. The closest noise sensitive receptors near the site are single-family residences immediately adjacent to the project site to the northeast on Winona Lane and the Sebastopol Charter School approximately 70 feet to the north of the northernmost project boundary.

Vibration sensitive receptors are similar to noise sensitive receptors, such as residences, and institutional uses, such as schools, churches, and hospitals.

Project Noise Setting

The most common source of noise in the project site vicinity is vehicular traffic from State Route (SR) 116/Gravenstein Highway North. Noise monitoring in the project area was conducted by Veneklasen Associates in May of 2023 (Veneklasen Associates 2023). To characterize ambient noise levels in the project vicinity, one short-term (15 minute) and two long-term (24 hour) noise level measurements were conducted on May 9 and May 10, 2023. The approximate noise measurement locations are shown in Figure 4.10-2. Shown in Table 4.10-1, short-term noise measurement (ST-1) was conducted approximately 100 feet west of Hurlbut Avenue in the project site. (LT-1) was conducted Approximately 300 feet west of Hurlbut Avenue. Long-term noise measurement (LT-2) was conducted along the northwest boundary of the commercial use to the west of the project site.

Table 4.10-1 Project Vicinity Noise Monitoring Results

Measurement Location	Measurement Location	Sample Times	Daytime Noise Level L_{eq} (dBA)	Nighttime Noise Level L_{max} (dBA)	24-hour Noise Level L_{dn} (dBA)
ST-1	Approximately 100 feet west of Hurlbut Avenue	2:55 – 3:10 p.m.	50	N/A	N/A
LT 1	Approximately 300 feet west of Hurlbut Avenue	4:00 – 3:00 p.m.	46	38	57
LT 2	Approximately 210 feet northeast of Highway 116/Gravenstein Hwy N	4:00 – 3:00 p.m.	55	48	57

Source: Veneklasen Associate, Inc. 2023 (Appendix I)

4.10.2 Regulatory Setting

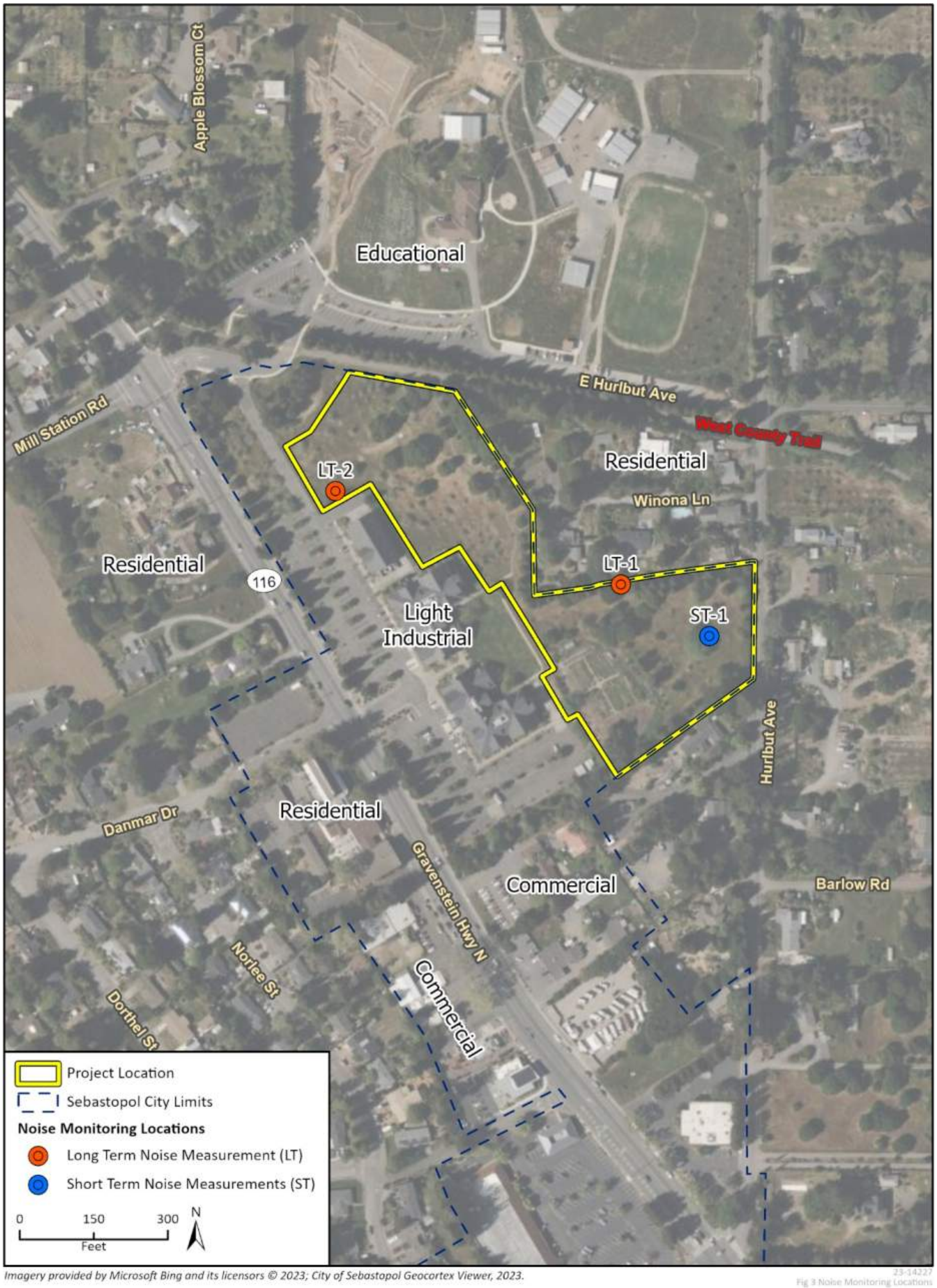
a. State Regulations

California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. California law requires each county and city to adopt a General Plan that includes a Noise Element prepared based on guidelines adopted by the Governor's Office of Planning and Research. The purpose of the Noise Element is to limit the exposure of the community to excessive noise levels. CEQA requires known environmental effects of a project to be analyzed, including environmental noise impacts.

California Building Code

California Code of Regulations Title 24, Building Standards Administrative Code, Part 2, Chapter 12, and the California Building Code codify the State noise insulation standards. These noise standards apply to new construction in California to control interior noise levels as they are affected by exterior noise sources and interior noise sources from separate areas. The regulations specify that interior noise levels shall not exceed 45 dB CNEL/L_{dn} in any habitable room, as well as specifying sound transmission class requirements for walls, floors, and ceilings around sleeping units.

Figure 4.10-2 Approximate Noise Monitoring Locations



Source: Veneklasen Associates 2023

California General Plan Guidelines

The California General Plan Guidelines, published by the Governor's Office of Planning and Research, indicate acceptable, specific land use types in areas with specific noise exposure. The guidelines also offer adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution. These guidelines are advisory, and local jurisdictions have the responsibility to set specific noise standards based on local conditions. Please refer to the discussion below, under the Sebastopol General Plan Noise Element, for the compatibility guidelines adopted by the City of Sebastopol.

b. Local Regulations

City of Sebastopol General Plan

The Noise section of the General Plan identifies noise and land use compatibility standards for various land uses. The City's goal is to address major noise sources and to promote safe and comfortable noise levels throughout Sebastopol. The Land Use Compatibility for Community Noise Environment from the Noise Element of the General Plan (Sebastopol 2016) is shown in Table 4.10-2 and is used to determine the compatibility of land uses when evaluating proposed development projects.

Table 4.10-2 Land Use Compatibility for Community Noise Environments

	Exterior Noise Exposure (Ldn, dB)			
Land Use Category	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential	50-60	60-70	70-75	>75
Transient Lodging – Motels, Hotels	50-60	60-75	75-80	>80
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-60	60-70	70-80	>80
Auditoriums, Concerts, Halls, Amphitheaters	50-70	–	70-80	>87
Playgrounds, Neighborhood Parks	50-63	63-70	70-75	>75
Golf Course, Stables, Water Recreation, Cemetery	50-63	63-70	70-80	>80
Office Buildings, Businesses Commercial and Professional	50-70	70-77	77-87	>87
Industrial, Manufacturing Utilities, Agriculture	50-70	70-75	75-87	>87

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. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

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.

dBA = A-weighted sound pressure level; DNL = Day-Night Average Level

Source: Sebastopol General Plan, 1994

For a residential development, the City's land use compatibility indicates that the maximum "normally acceptable" exterior noise level is 60 Ldn. For a residential development with exterior noise levels up to 70 Ldn, the land use is "conditionally acceptable," in which the specified land use may be permitted only after detailed analysis of the noise reduction requirements and noise insulation features included in the design. This study will review the exterior noise levels to verify it is within the range of acceptability per the City's land use compatibility.

The City's General Plan has also established noise standards for residential land uses impacted by stationary (non- transportation) sources, such as mechanical equipment or similar. The standards do not apply to transportation sources, such as car pass-bys or emergency vehicles. See Table 4.10-3 for the criteria for stationary (non-transportation) sources.

Table 4.10-3 Stationary (Non-Transportation) Noise Source Standards

	Exterior Noise-Level Standard (dBA)			
	Daytime (7am-10pm)		Nighttime (10pm-7am)	
Land Use Receiving the Noise	L_{eq}	L_{max}	L_{eq}	L_{max}
Residential[1]	55	70	45	65

[1] The residential standards apply to all properties that are zoned for residential use. The exterior noise level standard

Source: Sebastopol General Plan 1994.

The following policies from the Noise Element are relevant to the proposed project:

Policy N-1.1 Require development and infrastructure projects to be consistent with the Land Use Compatibility for Community Noise Environments standards (see Table 2) to ensure acceptable noise levels for existing and future development.

Policy N-1.2 Require development and infrastructure projects to be consistent with the Land Use Compatibility for Community Noise Environments standards (see Table 2) to ensure acceptable noise levels for existing and future development.

Policy N-1.3 Require development and infrastructure projects to be consistent with the Land Use Compatibility for Community Noise Environments standards (see Table 2) to ensure acceptable noise levels for existing and future development.

Policy N-1.6 Require acoustical studies for new developments, projects seeking use permits related to activities that would increase noise levels, and transportation improvements that affect noise-sensitive uses such as schools, hospitals, libraries, group care facilities, convalescent homes, and residential areas.

Policy N-1.7 For projects that are required by the California Environmental Quality Act (CEQA) to analyze noise impacts, the following criteria shall be used to determine the significance of those impacts:

Stationary and Non-Transportation Noise Sources

- A significant impact will occur if the project results in exceedance of the noise level standards contained in the Noise Element, or the project will result in an increase in ambient noise levels by more than 3 dB, whichever is greater. This does not apply to construction activities which are conducted according to the best practices outlined in Action N-1f. Compliance with the requirements outlined in Action N-1f shall be sufficient to reduce construction-related noise impacts to a less than significant level.

Transportation Noise Sources

- Where existing traffic noise levels are less than 60 dB Ldn at the outdoor activity areas of noise- sensitive uses, a +5 dB Ldn increase in roadway noise levels will be considered significant; and
- Where existing traffic noise levels range between 60 and 65 dB Ldn at the outdoor activity areas of noise-sensitive uses, a +3 dB Ldn increase in roadway noise levels will be considered significant; and
- Where existing traffic noise levels are greater than 65 dB Ldn at the outdoor activity areas of noise-sensitive uses, a +1.5 dB Ldn increase in roadway noise will be considered significant.

Policy N-1.11 Ensure that existing development is protected, to the greatest extent feasible, from noise impacts due to construction on adjacent or nearby properties through implementation of best practices, as outlined in Action N-1f.

Policy N-1.13 Control non-transportation related noise from site specific noise sources to the standards shown in **Error! Reference source not found.**

Policy N-1.14 Ensure that new development does not result in indoor noise levels exceeding 45 dBA L_{dn} for residential uses.

Policy N-1.15 Require construction activities to comply with standard best practices (see Action N-1f).

Action N-1f Require construction projects that may generate excessive noise impacts to implement the following types of standard best practices, as applicable, to reduce construction noise impacts to the extent feasible:

- Noise-generating construction activities, including truck traffic coming to and from the construction site for any purpose, shall be limited as specified in the Noise Ordinance.
- All equipment driven by internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.

- The construction contractor shall utilize “quiet” models of air compressors and other stationary noise sources where technology exists.
- At all times during project grading and construction, stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from residences.
- Unnecessary idling of internal combustion engines shall be prohibited.
- Construction staging areas shall be established at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction activities, to the extent feasible.
- Neighbors located adjacent to the construction site shall be notified of the construction schedule in writing.
- The construction contractor shall designate a “noise disturbance coordinator” who will be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall be responsible for determining the cause of the noise complaint (e.g., starting too early, poor muffler, etc.) and instituting reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site

Policy N-1.16 Require new development to minimize vibration impacts to adjacent uses during demolition and construction. A vibration limit of 0.30 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction.

Policy N-1.18 Ensure that an acceptable noise environment is maintained in residential areas and areas with sensitive uses by ensuring that uses, operations, and fixed equipment maintain compliance with City standards and by providing for the regulation of short-term increases in non-transportation noise levels through the Municipal Code.

City of Sebastopol Municipal Code

The goal of the City’s Noise Ordinance is to prohibit unnecessary, excessive, and annoying noises, subject to its police power. There are various sections of the Noise Ordinance that are directly related and applicable to the project. Section 8.25.060 establishes the noise level standards for residential land uses as provided in Table 4.10-4, which are consistent with the standards from the Noise Element within the City’s General Plan (see Table 4.10-3).

Table 4.10-4 City of Sebastopol Noise Level Standards

	Exterior Noise Standards	
Location of Measurement	**Daytime**	**Nighttime**
Monday through Friday	8:00 a.m. - 10:00 p.m.	10:00 p.m. – 8:00 a.m.
Exterior	55 dBA	45 dBA
Saturday and Sunday before Observed Holiday	9:00 a.m. - 10:00 p.m.	10:00 p.m. – 9:00 a.m.
Exterior	55 dBA	45 dBA
Sunday	9:00 a.m. - 7:00 p.m.	10:00 p.m. – 9:00 a.m.
Exterior	55 dBA	45 dBA

a) Basic noise level for a cumulative period of not more than 15 minutes in any one hour; or
b) Basic noise level plus five dBA for a cumulative period of not more than 10-minutes in any one hour; or
c) Basic noise level plus 14 dBA for a cumulative period of not more than 5 minutes in any one hour; or
d) Basic noise level plus 15 dBA at any time.
Source: City of Sebastopol Municipal Code Section 8.25.060.

Item 4 within section 8.25.060 is specifically for areas with high background noise and impulse noise. It states in cases where the background noise levels caused by sources not subject to these regulations exceed the standards listed in Table 4.10-4, a source shall be considered to cause excessive noise if the noise emitted by such source exceeds the background noise levels by 5 dBA, provided that no source subject to the provisions of the Noise Ordinance shall emit noise in excess of 80 dBA at any time. Item 4 also states no person shall cause or allow the emission of impulse noise in excess of 80 dB peak sound pressure level during the nighttime to any residential zone or in excess of 100 dB peak sound pressure level at any time in any zone.

Item 6 within section 8.25.060 lists exemptions to the Noise Ordinance, which are as follows:

- Noise generated by any construction equipment which is operated during daytime hours, defined for the purposes of this section as from 7:00 am to 8:00 pm, Monday through Friday, 8:00 am to 5:00 pm on Saturdays, and from 8:00 am to 5:00 pm on Sundays.
- Noise from demolition work conducted during daytime hours (see Table 4.10-4). When considered emergency work, demolition shall be exempted at all times from the noise levels in the Noise Ordinance.
- Noise created by refuse and solid waste collection; provided, that the activity is conducted during daytime hours (see Table 4.10-4).

4.10.3 Impact Analysis

a. Significance Thresholds and Methodology

Significance Thresholds

The following significance criteria for noise were derived from the Environmental Checklist in State CEQA Guidelines Appendix G. An impact of the Project would be considered significant and would require mitigation if it would meet one of the following criteria:

1. Generate 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 applicable standards of other agencies;
2. Generate excessive groundborne vibration or groundborne noise levels; or
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.

Construction Noise Thresholds

As described above, the City of Sebastopol Municipal Code provides noise standards for different land use types with the exception of temporary construction work. Noise generated by temporary construction work associated with the project would be exempt from the City of Sebastopol Municipal Code noise standards. While the City does not have specific noise level criteria for assessing construction noise impact, FTA has developed guidance for determining if construction of a project would expose various land uses to significant noise levels or if a project would result in a substantial temporary increase in noise levels (FTA 2018). Based on FTA guidance, a significant impact would occur if project-generated construction noise exceeds 80 dBA L_{eq} noise limit at the nearest residences or school.

Operational Stationary Source Noise Thresholds

The City has adopted exterior noise standards in the SMC and the General Plan Noise Element regulating operational stationary noise sources in the City. The proposed project would result in a significant impact if noise from project stationary operational noise sources exceeds 45 dBA L_{eq} at a residential property line during nighttime hours between 10:00 p.m. and 7:00 a.m. or 55 dBA L_{eq} during daytime hours between 7:00 a.m. and 10:00 p.m.

Traffic Noise Thresholds

A project would normally have a significant effect on the environment related to traffic noise if it would substantially increase the ambient noise levels for adjoining areas. The following thresholds of significance from Policy N-1.7 in the Sebastopol General Plan (Sebastopol 2016) are used to assess traffic noise impacts at sensitive receptor locations. A significant impact would occur if traffic noise increases the existing noise environment by the following:

- Greater than 1.5 dBA Ldn for ambient noise environments of 65 dBA Ldn and higher.
- Greater than 3 dBA Ldn for ambient noise environments of 60 to 64 Ldn
- Greater than 5 dBA Ldn for ambient noise environments of less than 60 dBA Ldn

Groundborne Vibration Thresholds

The City of Sebastopol General Plan (Sebastopol 2016) has adopted quantified limits to assess vibration impacts during construction and operation of 0.3 in/sec PPV at any sensitive receptor. For example, impacts would be significant if vibration levels exceed 0.3 in/sec PPV for residential structures and 0.3 in/sec PPV for commercial structures, which is the limit where minor cosmetic (i.e., non-structural) damage may occur to these buildings.

Methodology

The following describes the methodology, including models, used to evaluate the significance of potential noise and vibration impacts related to the proposed project.

Construction Noise

Construction noise was estimated using the FHWA Roadway Construction Noise Model (RCNM) (FHWA 2006). RCNM predicts construction noise levels for a variety of construction operations based on empirical data and the application of acoustical propagation formulas. Using RCNM, construction noise levels were estimated at noise sensitive receptors near the project site. RCNM provides reference noise levels for standard construction equipment, with an attenuation of 6 dBA per doubling of distance for stationary equipment.

Variation in power imposes additional complexity in characterizing the noise source level from construction equipment. Power variation is accounted for by describing the noise at a reference distance from the equipment operating at full power and adjusting it based on the duty cycle of the activity to determine the L_{eq} of the operation (FTA 2018). Each phase of construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some will have higher continuous noise levels than others, and some have high-impact noise levels. Construction noise would typically be higher during the heavier periods of initial construction (i.e., grading) and would be lower during the later construction phases. Construction equipment would not all operate at the same time or location. In addition, construction equipment would not be in constant use during the 8-hour operating day.

Over the course of a typical construction day, construction equipment could be located adjacent to the nearest residential uses but would typically be located at an average distance further away due to the nature of construction where equipment is mobile throughout the site during the day. Construction activity would result in temporary noise in the project area, exposing surrounding sensitive receptors to increased noise levels. The project would involve demolition, site preparation, grading, building construction, paving, and architectural coating. Construction equipment is typically dispersed in various areas of the site, with only a limited amount of equipment operating near a given location at a particular time. The FTA 2018 *Transit Noise and Vibration Impact Assessment* document recommends evaluating construction noise impacts from the center of the construction site, stating that the distance variable in its recommended construction noise calculation "assumes that all equipment operates at the center of the project." Therefore, it is common, industry-standard practice to analyze average construction noise from the center of the site because this is the approximate center of where noise would be generated as equipment moves around the site throughout the workday. In accordance with FTA recommendations, construction noise was measured from the approximate center of each phase.

For demolition, site preparation, grading, building construction and architectural coating, from the center of the western portion of the project site, the nearest noise-sensitive receptors include single-family residence located approximately 130 feet east on Winona Lane and the Sebastopol Charter School at 250 feet north on Gravenstein Highway North. From the center of the eastern portion of the project site, the nearest noise-sensitive receptors include a single-family residence on Winona Lane located approximately 135 feet to the north. For paving, from the center of the proposed parking lot located between the western and eastern portion of the site, the nearest noise-sensitive receptors include single-family residence located approximately 125 feet north on Winona Lane and Sebastopol Charter School 250 feet north of the center of the western portion of the project site. Therefore, construction noise was modeled at these distances. Attenuation from intervening structures or topography was conservatively not included in the calculations. Equipment assumed for each phase of construction was modeled consistent with Section 4.3, *Air Quality.*

Operational Stationary Noise

MECHANICAL EQUIPMENT

The primary on-site operational noise source from the project would be from split-system outdoor condensing units (HVAC) that are anticipated to be on the ground floor of various buildings and transformers (less than 2,000 kVA). Based on principles of distance attenuation, HVAC and transformer noise levels are estimated at nearby sensitive receptors. Typical HVAC equipment generates noise levels ranging up to 55 dBA at a distance of 15 feet and less than 45 dBA at 60 feet. For transformers no greater than 2,000 kVA, the noise level is expected to be less than 55 dBA at 30 feet and less than 45 dBA at approximately 120 feet (Veneklasen Associates 2023).

OPERATIONAL TRAFFIC NOISE

Noise levels affecting the proposed project site would be primarily influenced by traffic noise from SR 116, Hurlbut Avenue and Mill Station Road. SR 116 is a two to four-lane roadway with a posted speed limit of 30 miles per hour (mph). Hurlbut Avenue and Mill Station Road are two lane roadways with a posted speed limit of 25 mph. Traffic volumes used for the noise analysis are shown in Table 4.10-7, which are based on the intersection turning movement data provided in the project traffic report (W-Trans 2023). To analyze the increase in traffic noise levels the formula of 10 x LOG (future traffic volume/existing traffic volume) and the assumption that the daily volume is approximately ten times the peak hour volume were used.

Groundborne Vibration

The greatest vibratory source during construction would be a vibratory roller. Neither blasting nor pile driving would be required for construction of the proposed project. Table 4.10-5 shows typical vibration levels for various pieces of construction equipment.

Vibration limits used in this analysis to determine a potential impact to local land uses from construction activities are based on information and recommend procedures contained in the FTA *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).

Table 4.10-5 Typical Vibration Levels for Construction Equipment

Equipment	PPV (in/sec) at 25 Feet
Vibratory Roller	0.21
Large Bulldozer	0.089
Loaded Trucks	0.076
Small Bulldozer	0.003
Static Roller	0.05
Sources: FTA 2018	

Impact of the Environment on the Project

As a result of the Supreme Court decision regarding the assessment of the environment's impacts on projects (*California Building Industry Association [CBIA] v. Bay Area Air Quality Management*

District [BAAQMD], 62 Cal. 4th 369 [No. S 213478] issued December 17, 2015), it is generally not considered the purview of the CEQA process to evaluate the impact of existing environmental conditions on a proposed project. Therefore, this environmental analysis does not consider the potential impacts of the environment (i.e., existing noise) on the project.

b. Project Impacts and Mitigation Measures

Threshold 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 applicable standards of other agencies?

Impact NOI-1 CONSTRUCTION OF THE PROJECT WOULD TEMPORARILY INCREASE AMBIENT NOISE LEVELS, BUT NOISE LEVELS WOULD NOT EXCEED APPLICABLE STANDARDS. AMBIENT NOISE IN THE PROJECT VICINITY WOULD INCREASE FROM ON-SITE ACTIVITIES AND INCREASED TRAFFIC. TRAFFIC NOISE INCREASES WOULD BE LESS THAN SIGNIFICANT. OPERATIONAL STATIONARY SOURCE NOISE WOULD EXCEED STANDARDS ESTABLISHED BY THE CITY. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION.

The project-specific noise analysis focuses on the construction and operational impacts to determine if the project would expose persons to or generate noise levels in excess of established standards or cause a substantial permanent increase in ambient noise levels in the project vicinity.

Construction

Project construction activities are anticipated to occur in two phases. Phase 1 would occur over the course of 24 months, from June 2024 through June 2026. Phase 2 would occur the course of 23 months, from March 2025 through February 2027. Construction noise would be generated during the demolition, site preparation, grading, building construction, paving and architectural coating phases of construction. Distances and equipment assumed are discussed under *Methodology*. Table 4.10-6 identifies the estimated noise levels at nearby sensitive receptors from the center of each phase based on the conservatively assumed combined use of all construction equipment during each phase of construction.

Table 4.10-6 Estimated Noise Levels by Construction Phase at Sensitive Receptors

	L_{eq} dBA			
Construction Activity Phase	RCNM Reference Noise Level	Single Family Residential on Winona Lane	Single Family Residential on Hurlbut Avenue	Sebastopol Charter School
Distance in feet	**50**	**130[1]**	**160[2]**	**250[3]**
Demolition	76	67	66	62
Site Preparation	84	75	74	70
Grading	84	75	74	70
Building Construction	77	68	67	63
Architectural Coating	77	68	67	63

	L_{eq} dBA			
Construction Activity Phase	RCNM Reference Noise Level	Single Family Residential on Winona Lane	Single Family Residential on Hurlbut Avenue	Sebastopol Charter School
Distance in feet	**50**	**125[4]**	**280[4]**	**250[3]**
Paving	84	76	69	70

Notes: Calculations performed with the FHWA's RCNM software are included in Appendix J.
Noise levels rounded to the nearest whole number.
[1] Distance from the center of the western and eastern portion of the site.
[2] Distance from the center of the eastern portion of the site.
[3] Distance from the center of the western portion of the site.
[4] Distance from the center of parking lot at the southwest end of the eastern portion of site.

As shown in Table 4.10-6, construction noise could be as high as approximately 76 dBA L_{eq} at residences of Winona Lane. Therefore, construction noise levels would not exceed the FTA construction noise threshold of 80 dBA L_{eq} at residential receptors.

Additionally, pursuant to SMC Section 8.25.060 noise generated by construction activities is exempt from compliance with the noise level limits contained in the City's General Plan if the project construction activities occur between the hours of 7:00 a.m. to 8:00 p.m., Monday through Friday, and 8:00 a.m. to 5:00 p.m. on Saturdays and Sundays. As discussed in Chapter 2, *Project Description,* project construction hours would be limited to the allowable hours pursuant to SMC. Although the noise generated by project construction would be higher than the ambient noise levels, which may result in a temporary increase in ambient noise levels, construction noise would be temporary and cease once project construction is completed. Information provided by the client, construction activities would not occur during nighttime hours. While construction noise may cause short-term annoyance to adjacent uses, it would be temporary and restricted to the hours permitted by the City's noise ordinance. Therefore, noise from construction activities would result in a less than significant impact.

Operation

Operational Stationary Noise

The primary on-site operational noise source from the project would be from HVAC units and 2,000 kVA transformers that are anticipated to be on the ground floor of various buildings and around the project site and anticipated to run for a period of 24-hours. HVAC units would be located as close as approximately 60 feet and transformers would be located as close as approximately 120 feet from the sensitive receptors to the east of the project site. Typical HVAC equipment generates noise levels up to 55 dBA at a distance of 15 feet. At a distance of 60 feet, noise levels from HVAC noise would attenuate to approximately 45 dBA. A transformer no greater than 2,000 kVA is expected to generate noise levels up to 55 dBA at 30 feet and less than 45 dBA at approximately 120 feet. The site plan provided by the client indicates that these units will be located closer than the minimum distance (i.e., 60 feet) within which noise would be compliant with the City's nighttime exterior standard of 45 dBA. Therefore, if uncontrolled, project operational stationary noise would be considered significant. Implementation of Mitigation Measure NOI-1 would reduce this impact to a level of less than significant.

Operational Traffic Noise

The project would generate new vehicle trips that would use area roadways. The traffic noise increases caused by project traffic are shown in Table 4.10-7. As shown in Table 4.10-7, the project traffic noise increase would be up to 0.1 dBA L_{dn} on all study roadway segments. Project traffic noise increases would be less than 1.5 dBA L_{dn} (the most stringent threshold) along all roadway study segments. Therefore, project traffic noise impacts would be less than significant. Cumulative traffic noise impacts are discussed in Section 4.10.4, *Cumulative Impacts*.

Mitigation Measures

NOI-1 Mechanical Equipment Noise Reduction

For outdoor condensing units (HVAC) and transformers directly adjacent to noise-sensitive receptors, provide a solid barrier with a height blocking the line-of-sight to the nearby noise-sensitive receptors. The minimum density of the barrier shall be 2 pounds per square foot with no holes or gaps. Once final equipment selection is made, an acoustical analysis of the noise from project mechanical and electrical equipment to surrounding properties must be completed by a qualified acoustical consultant prior to final design to verify compliance with the City's nighttime exterior noise standard of 45 dBA.

Significance After Mitigation

With implementation of Mitigation Measure NOI-1, the noise levels from HVAC and on-site transformers would be attenuated to a level below the City's nighttime exterior noise standard of 45 dBA. Therefore, impacts would be less than significant with mitigation.

Table 4.10-7 Off-site Project Traffic Noise Increases

Roadway Segment	Roadway Segment Volumes (ADT)				dBA (Ldn)		
	Existing	Existing + Project	Future	Future + Project	Project Noise Increase	Cumulative Increase	Project Cumulative Contributio n
Gravenstein Highway 116 north of Mill Station Road	13,970	14,170	17,440	17,640	0.1	1.0	<0.1
Gravenstein Highway 116 between Mill Station Road and Hurlbut Avenue	12,530	12,820	16,790	17,080	0.1	1.6	0.3
Gravenstein Highway 116 between Hurlbut Avenue and Covert Lane	13,070	13,400	17,690	18,020	0.1	1.4	0.1
Gravenstein Highway 116 between Hurlbut Avenue and Covert Lane	13,070	13,400	17,690	18,020	0.1	1.4	0.1
Mill Station, west of Gravenstein Highway 116	4,560	4,600	4,700	4,740	<0.1	0.2	<0.1
Hurlbut Avenue, east of Gravenstein Highway 116	1,430	1,430	1,370	1,370	<0.1	-0.2	<0.1
Hurlbut Avenue, west of Gravenstein Highway 116	2,960	2,960	3,710	3,710	<0.1	1.0	<0.1

Notes: ADT = average daily traffic. The estimated traffic noise increase is based on the following formula: 10xLOG(future traffic volume/existing traffic volume).

ADT estimated based on the peak hour volume times ten.

Source: W-Trans 2023 (Appendix G)

Threshold: Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Impact NOI-2 PROJECT CONSTRUCTION WOULD INTERMITTENTLY GENERATE GROUNDBORNE VIBRATION ON A SITE WHICH MAY AFFECT SENSITIVE RECEPTORS NEAR THE PROJECT SITE, BUT PROJECT VIBRATION WOULD NOT CREATE EXCESSIVE LEVELS OF VIBRATION THAT COULD CAUSE ARCHITECTURAL DAMAGE. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Project construction would not involve activities typically associated with excessive groundborne vibration such as pile driving or blasting. The greatest anticipated source of vibration during general project construction activities would be from vibratory roller, which may be used at a distance of 25 feet or greater from the nearest residential structures to the east. A vibratory roller creates a vibration level of approximately 0.210 in/sec PPV at a distance of 25 feet. At a distance of 35 feet from the nearest commercial building to the west, vibration levels would attenuate to 0.127 in/sec PPV or less, which is lower than the threshold of 0.3 in/sec PPV stated in the Sebastopol General Plan (Sebastopol 2004). Therefore, temporary impacts associated with construction would be less than significant. In addition, the project does not include any substantial vibration sources associated with operation.

Table 4.10-8 lists groundborne vibration levels from various types of construction equipment at nearby sensitive receptors.

Table 4.10-8 Construction Equipment Vibration Levels

	Approximate Vibration Level (in/sec PPV)			
Equipment	Reference Level 25 Feet from Source	Single Family Residential on Winona Lane (60 feet)	Single Family Residential on Hurlbut Avenue (40 feet)	Commercial to the West (35 feet)
Vibratory Roller	0.210	0.056	0.104	0.127
Large Bulldozer	0.089	0.024	0.044	0.054
Loaded Truck	0.076	0.020	0.038	0.046
Small Bulldozer	0.003	0.001	0.001	0.002

Source: FTA 2018.

Vibration levels from project construction activities would not exceed the significance threshold of 0.3 in/sec PPV at the nearest off-site building. Therefore, construction vibration impacts would be less than significant. In addition, the project does not include any substantial vibration sources associated with operation. Thus, operational vibration impacts would be less than significant.

Mitigation Measures

None required.

Threshold:	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?

Impact NOI-3 THE PROJECT WOULD NOT EXPOSE PEOPLE RESIDING OR WORKING IN THE PROJECT AREA TO EXCESSIVE NOISE LEVELS RELATED TO AIRSTRIP/AIRPORT OPERATION. NO IMPACT WOULD OCCUR.

There are no airports within two miles of the project. The nearest airport to the project site is the Sonoma County Airport, which is located approximately 6.4 miles north. Therefore, the proposed project would not expose people working in the project area to excessive noise levels. There would be no impact.

Mitigation Measures

None required.

4.10.4 Cumulative Impacts

Construction Noise

Cumulative noise assessment considers development of the project in combination with ambient growth and development projects within the vicinity of the project site. As discussed in Chapter 3, *Environmental Settings*, there are several cumulative project sites in the city. Noise from construction of development projects is typically localized and has the potential to affect noise-sensitive uses within approximately 500 feet from the construction site. Thus, noise from construction activities for two projects within 1,000 feet of each other can contribute to a cumulative noise impact for receptors located midway between the two construction sites. Of the cumulative projects, the 845 Gravenstein Highway North low-income residential project is the only project located within 1,000 feet. Construction for 845 Gravenstein Highway North project was completed and the Horizon Shine RV Village opened on February 1, 2022. Therefore, cumulative construction noise impacts would be less than significant.

Operational Noise

Cumulative development would result in stationary (non-traffic) operational noise and vibration increases in the project vicinity. Each cumulative project would be required to complete project- and site-specific noise and vibration assessments for operational impacts and mitigate each project accordingly since operational noise and vibration impacts would be greatest on each project site.

Cumulative development in the project area would increase noise levels along local roadways as a result of additional vehicle trips. A cumulative traffic noise increase would be considered significant if the cumulative noise increase was found to be potentially significant and the project's contribution to the cumulative increase is greater than 1 dBA L_{dn}. As shown in Table 4.10-7, the cumulative traffic noise increase would be up to 1.6 dBA L_{dn}, which exceeds the most stringent threshold of 1.5 dBA L_{dn}. Therefore, cumulative traffic noise increase on Gravenstein Highway 116 would be significant. However, the project's contribution to the cumulative increase would be 0.3 dBA L_{dn} or less. Therefore, the project's contribution to a cumulative traffic noise impact would be less than significant.

Groundborne Vibration

Although there could be other cumulative projects simultaneously under construction near the proposed project, the potential for construction groundborne vibration impacts is within relatively close distances (e.g., within approximately 25 feet for a vibratory roller). Since no two construction cumulative projects would both be within 25 feet of a given sensitive structure, cumulative groundborne vibration impacts would be less than significant.

Airport Noise

Neither the project nor any of the cumulative projects would directly add airport capacity or change flights patterns. There would be no cumulative airport noise impact.

4.11 Population and Housing

This section summarizes existing and projected population and housing in the city of Sebastopol and analyzes the impacts on population and housing due to the project.

4.11.1 Setting

a. Population

The city of Sebastopol is located in Sonoma County, approximately 15 miles east of the Pacific Ocean, and 52 miles north of San Francisco. Sebastopol was incorporated as a city on June 13, 1902 and is now considered the hub of West Sonoma County (Sebastopol Area Chamber of Commerce 2023). In 2022, the city had a population of approximately 7,400 residents (Department of Finance [DOF] 2023).

In 2010, the population of Sebastopol was approximately 7,379 residents (DOF 2021). By 2015, the population had increased to 7,624 residents and reached a ten-year period peak high population of 7,830 in 2019 (DOF 2021). However, by 2021, growth in the city had slowed and the population decreased to 7,482 residents and then further to 7,433 residents in 2022 (DOF 2023). The recent data show a growing trend of incremental population loss in the city.

Housing

A household is defined as a group of people who occupy a housing unit (US Census Bureau 2021). A household differs from a dwelling unit because the number of dwelling units includes both occupied and vacant dwelling units. Typically, not all the population in a given area lives in households. A portion of the population lives in group quarters, such as board and care facilities, while others are homeless.

Housing Units

Table 4.11-1 shows the growth in number of housing units in the city, County, and State between 2010 and 2022. As shown in Table 4.11-1, between 2010 and 2022, 141 units were added to the city's housing inventory resulting in an overall growth of approximately four percent during this period. Between 2010 and 2022, the County grew at a slower rate of one percent. The State also grew at a slower rate of 6.7 percent.

Table 4.11-1 Housing Inventory in the City, County, and State

	Sebastopol		Sonoma County		California	
	2010	2022	2010	2022	2010	2022
Total Housing Units	3,465	3,606	204,572	206,637	13,670,304	14,583,998
Occupied	3,276	3,453	185,825	189,406	12,568,167	13,612,650
Vacancy Rate	5.5%	4.2%	9.2%	8.3%	8.1%	6.7%
Percent Change in Total Housing Units from 2010 to 2022	4%		1%		6.7%	

Source: DOF 2021 (for 2010 data) and DOF 2023 (for 2022 data)

In 2022, approximately 2,256 of the housing units in the city were single-family detached homes, approximately 361 units were single-family attached homes, approximately 920 units were multi-family units (buildings of at least two units), and approximately 69 units were mobile homes (DOF 2023).

Household Size

Small households (one to two persons per household [pph]) traditionally occupy units with zero to two bedrooms; family households (three to four pph) normally occupy units with three to four bedrooms. Large households (five or more pph) typically occupy units with four or more bedrooms. The number of units in relation to the household size may reflect preference and economics. Many small households obtain larger units, and some large households live in small units, for economic reasons. Table 4.11-2 compares the size of households in the city, county, and State in 2010 and 2022.

Table 4.11-2 Household Size in the City, County, and State

	Sebastopol		Sonoma County		California	
	2010	2022	2010	2022	2010	2022
Household Size (pph)	2.21	2.12	2.55	2.49	2.90	2.81
Percent Change from 2010 to 2022	-4.07%		-2.35%		-3.1%	

Source: DOF 2021 (for 2010 data) and DOF 2023 (for 2022 data)

As shown in Table 4.11-2, the average household size in Sebastopol was approximately 2.21 pph in 2010 and reduced to roughly 2.12 pph by 2022. Sonoma County saw a similar reduction in household size from 2.55 pph in 2010 to 2.49 pph in 2022. Overall, both the city and county have followed a similar trend in decreasing household size as the State, which saw a reduction from 2.90 in 2010 to 2.81 in 2022.

b. Projections

Table 4.11-3 presents population, dwelling units, and employment projections by DOF and ABAG through 2050 for Sonoma County. A city-specific breakdown for population projections is not available at this time, so county projections presented within the Association of Bay Area Governments' (ABAG) Plan Bay Area 2050 have been utilized instead. As one of the smaller cities within Sonoma County, Sebastopol only accounts for a portion of the projected growth. However, the total county projections are provided as a conservative estimation of growth trends within the city of Sebastopol.

Table 4.11-3 Sonoma County Estimated Population and Employment

Sonoma County[1]	2022	2050	Change 2022 to 2050	Percent Change 2022 to 2050
Households	206,637	220,000	13,363	6%
Jobs	240,500[2]	251,000	10,500	4%

[1] A city-specific breakdown for population projections is not available through ABAG, so the County region as determined by Plan Bay Area 2050 has been utilized instead.

[2] Data is from most recent projections for number of employed persons in Sonoma County for the year 2022 (EDD 2023)

Source: ABAG 2021, DOF 2022b, EDD 2023

It is estimated the population of Sonoma County will grow approximately six percent between 2022 and 2050 (DOF 2023, ABAG 2021). This translates to an estimated 13,363 new residents by 2050. Jobs are expected to increase four percent between 2022 and 2050 resulting in more employment opportunities for existing and new residents. The available data shows an overall growth trend within the county; however, it is unlikely that most of the projected growth would occur within Sebastopol. As discussed above, Sebastopol is one of the smallest cities within Sonoma County and accounts for just 1.5 percent of the total county population (DOF 2023). It can reasonably be assumed that a majority of the projected growth would occur within larger cities such as Santa Rosa, Petaluma, Rohnert Park, and Windsor.

Furthermore, the City's Housing Element has been updated based on the 6th Cycle State requirements for the 2023-2031 planning horizon. According to the City's updated Housing Element, Sebastopol is required by their Regional Housing Needs Allocation (RHNA) to plan for a total of 213 new housing units through 2031 (City of Sebastopol 2023). The City has identified a majority of the projected units through RHNA Credits (Projected ADU development and pending, approved, or permitted projects) to meet its 6th Cycle, including the proposed project.

4.11.2 Regulatory Setting

a. Federal Regulations

There are no federal regulations that would be applicable to the project.

b. State Regulations

Housing Element Law

First enacted in 1969, housing element law (Government Code Sections 65580–65589.8) mandates that local governments adequately plan to meet the existing and projected housing needs of all economic segments of the community. The law acknowledges that in order for the private market to adequately address housing needs and demand, local governments must adopt land use plans and regulatory systems that provide opportunities for, and do not unduly constrain, housing development. As a result, housing policy in the State rests largely upon the effective implementation of local general plans and, in particular, local housing elements. Housing element law also requires the California Department of Housing and Community Development (HCD) to review local housing elements for compliance with State law and to report its written findings to the local government.

California Government Code Section 65583 specifies the State Housing Element requirements. The Housing Element is one of the State-mandated elements of the General Plan and is updated every eight years. HCD is responsible for reviewing Housing Elements to ensure compliance with State law.

c. Local Regulations

City of Sebastopol Housing Element

The Housing Element is one of the seven State-mandated elements of the General Plan (Government Code Sections 65300 through 65303.4). The Housing Element serves as a tool to identify and provide for the housing needs of the community. It identifies recent demographic and employment trends that may affect existing and future housing demand and supply. California law requires the Housing Element to establish policies and programs that will support the provision of an adequate housing supply for citizens of all income levels. The Housing Element is the only element that requires review by the State Department of Housing and Community Development (HCD). The element addresses the city's ability to meet the regional housing needs as determined by the State of California. Sebastopol's 6th cycle Housing Element was adopted on January 3, 2023, and Certified by HCD on March 7, 2023.

City of Sebastopol Growth Management Ordinance

The City's Growth Management Ordinance (GMO), which is part of the Sebastopol Municipal Code (SMC 17.500), was adopted to allow the City to manage and balance new residential growth so as not to exceed available resources including public infrastructure capacity, public services, and fiscal resources; and to protect the character and quality of life for existing and future residents of Sebastopol. The current adopted Ordinance establishes a residential development limit of 50 units per year. Certain types of residential development, such as ADUs, are exempt, while affordable housing units and downtown units are not subject to the 50-unit annual limit but do count towards the overall growth limit of 750 new units from 2017 to 2035. The General Plan allows for the carryover of the two previous years' allocations. As of January 1, 2023, the City's current available allocation for non-exempt units is 149 units.

4.11.3 Impact Analysis

a. Significance Thresholds and Methodology

Significance Thresholds

Based on Appendix G of the CEQA Guidelines a project may be deemed to have a significant impact on population and housing if it would:

1. Induce substantial unplanned population growth in an area either directly or indirectly; or
2. Displace substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere.

For purposes of this analysis, substantial population growth is defined as growth exceeding population growth outlined in the City's 6th Cycle Housing Element. Substantial displacement would occur if implementation of the project would displace more residences than would be accommodated through growth accommodated by the project.

Methodology

Population and housing trends in the City were evaluated by reviewing the most current data available from the DOF, ABAG, and the City's Housing Element. Impacts related to population are generally social or economic in nature. Under CEQA, a social or economic change generally is not considered a significant effect on the environment unless the changes are directly linked to a physical change.

b. Project Impacts and Mitigation Measures

Threshold 1:	Would the project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Impact POP-1 THE PROPOSED PROJECT WOULD CONSTRUCT 80 NEW SINGLE-FAMILY RESIDENCES AND UP TO 16 ACCESSORY DWELLING UNITS, WHICH WOULD INCREASE THE POPULATION IN SEBASTOPOL. HOWEVER, THE GROWTH ANTICIPATED AS A RESULT OF THE PROJECT IS ACCOUNTED FOR IN THE CITY'S HOUSING ELEMENT. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The proposed project would construct 80 solar all-electric, three-story townhome-style condominiums, with the potential for up to 16 Americans with Disability Act (ADA) accessible accessory dwelling units (ADUs). According to the California Department of Finance's population estimates, the average persons per household in Sebastopol was 2.12 in 2022 (DOF 2023). Assuming 2.12 persons per household, the 80 new single family residential units could generate approximately 170 new residents within the city. The project also includes the potential for up to 16 ADUs to be constructed as well. To conservatively estimate a maximum buildout which includes the construction of all 16 ADUs, the project would include 96 residential units in total, resulting in approximately 204 new residents within the city. In 2022, the total population of the city was 7,433 residents. The increase of 170 new residents would result in a total population of approximately 7,603 residents and a population increase of roughly 2.2 percent.

As described in Section 4.9.1, *Setting*, the City of Sebastopol is expected to plan for a total of 213 new units through the 2023-2031 RHNA planning period (City of Sebastopol 2023). Through the Housing Element, the City has identified meeting this goal through primarily projected ADU development and pending, approved, or permitted projects. As shown on Table 16 of the Housing Element, the proposed project is considered within the City's pending project list which would count for RHNA credit (City of Sebastopol 2023). The Housing Element underwent separate CEQA review and was ultimately approved by the City of Sebastopol in January 2023.

As discussed above under Regulatory Setting, the City's GMO was adopted to allow the City to manage and balance new residential growth. As of January 1, 2023, the City's current available allocation for non-exempt units is 149 units. Of the proposed 80 units, 68 would be market rate, while 12 would be deed-restricted as affordable (moderate income level). The deed-restricted units, along with any potential ADUs that are developed, are exempt from the GMO allocations. Therefore, the proposed project's 68 market rate units would fall under the available allocation of 149 units available and comply with the City's GMO. Furthermore, given that the State is currently in an ongoing housing crisis due to an insufficient housing supply, the additional residential units under the project would further assist in addressing the existing crisis and meeting the housing needs of the City's communities.

Therefore, because the project is designed for planned and orderly growth, as mandated by the State, development in accordance with the project would not indirectly induce growth in the City. Impacts would be less than significant.

Mitigation Measures

No mitigation measures would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 2:	Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Impact POP-2 THE PROPOSED PROJECT WOULD NOT RESULT IN THE DISPLACEMENT OF SUBSTANTIAL NUMBERS OF HOUSING OR PEOPLE. THE PROJECT WOULD FACILITATE THE DEVELOPMENT OF NEW HOUSING IN SEBASTOPOL IN ACCORDANCE WITH STATE AND LOCAL HOUSING GOALS. THERE WOULD BE NO IMPACT.

As described in Impact POP-1, the conservative estimate of the maximum residential buildout for the project is an additional 96 housing units, resulting in approximately 204 new residents within the city. The project site is currently vacant, and construction of the proposed project would not result in the demolition or removal of existing housing which would necessitate replacement housing elsewhere. It is not anticipated that operation of the proposed project would displace any existing people or housing. On the contrary, the proposed project would provide new housing opportunities for Sebastopol residents. Therefore, the proposed project would not result in the net loss or displacement of housing and would not require the construction of replacement housing elsewhere. There would be no impact.

Mitigation Measures

No mitigation measures would be required.

Significance After Mitigation

There would be no impact without mitigation.

4.11.4 Cumulative Impacts

The cumulative impacts assessment area for population and housing is the area within the limits of the City of Sebastopol. This is an appropriate cumulative impacts assessment area because the proposed project and the other reasonably foreseeable future projects listed in Table 3-1 would occur in the city limits and not contribute to growth beyond city limits.

The reasonably foreseeable future projects would include growth in the form of new structures and development as well as population growth from construction of new residential units. Some of the reasonably foreseeable future projects would not contribute to growth. For example, the 6828 Depot Street project would allow the construction of a hotel but would not include residential development or increase the number of people in Sebastopol. However, other reasonably foreseeable future projects would increase population, such as the 7621 Healdsburg Avenue townhomes, which would add residential units to cumulative impacts assessment area. Another example, the Woodmark Apartments project which is currently under construction and would likely finish Phase II of construction in the next five years. However, the City continues to refer to its General Plan and zoning ordinance to permit and plan development, including the reasonably foreseeable future projects.

A key part of this is the City's GMO, which allocates 50 dwelling units per year (plus exempt units), with carryover provisions. Once a residential project has obtained final discretionary approval, then needed allocations can be issued on a first come, first served basis by the Planning Director for the remaining allocations available that year in accordance with SMC 17.500.030(B). These dwelling allocations are valid until the discretionary approval expires. As of January 1, 2023, there are currently 149 unit allocations available for non-exempt units, of which the proposed project would need 68. Given the current development pipeline of anticipated projects, and timeline for construction for the proposed project, it is anticipated that adequate allocations would be available for the project.

Additionally, the reasonably foreseeable future projects do not include development projects that would result in substantial growth, but rather are relatively small projects that would incrementally increase population. The reasonably foreseeable future projects also are generally on sites without existing housing units, and therefore, would not displace substantial numbers of people or housing. Cumulative impacts related to substantial unplanned growth or displacement would be less than significant.

Implementation of the proposed project would contribute to increasing population and housing units within the City. Because the City's Housing Element plans for this growth it would not result in substantial unplanned growth, even when combined with the other reasonably foreseeable future projects. Therefore, the proposed project would not result in a cumulatively considerable contribution to unplanned growth.

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4.12 Public Services

This section assesses impacts associated with public services, including fire and police protection, public schools, libraries, and parks and recreation associated with project implementation. Impacts to water and wastewater infrastructure and solid waste collection and disposal are discussed in Section 4.18, *Utilities and Service Systems*. Impacts regarding wildland fires are discussed in Section 4.19, *Wildfire*.

4.12.1 Setting

a. Fire Protection

Fire protection, emergency medical services, and technical rescue services in the City of Sebastopol are provided by Sebastopol Fire Department (SFD) with mutual aid from the Gold Ridge Fire Protection Department (Gold Ridge FPD) and Graton Fire Protection District (Graton FPD). The station is located at 7425 Bodega Avenue in Sebastopol, approximately 1.1 miles southeast of the project site. In addition, the Sonoma County Fire District contracts with Sebastopol to provide fire and emergency services to an area immediately adjacent to the city on its eastern boundary, and northeast along State Route 12 (SR-12). The SFD provides a wide range of programs, including fire suppression, training, emergency medical services, hazardous materials cleanup, public education, and urban search and rescue. The SFD provides a response to an approximately 1.9 square mile area that includes the Sebastopol city limits and an unincorporated area of Sonoma County (City of Sebastopol 2023a).

The SFD operates as a volunteer department within the City government. It has one full-time chief, one full-time 40-hour fire engineer, and the remaining positions are staffed with 22 volunteer firefighters and six reserve firefighters (City of Sebastopol 2023a). The SFD responds to approximately 1,000 calls annually, with the heaviest demand being along SR-12 and State Route 116 (SR-116). Travel times are relatively low, with 90 percent of all emergency calls being responded to within three minutes and 16 seconds on average. However, turnout time is as long as five minutes and 47 seconds for 90 percent of emergency calls since 2019 (City of Sebastopol 2023b).

b. Police Protection

The Sebastopol Police Department (SPD) provides police protection services within the City. SPD is a full-service law enforcement agency tasked with providing public safety services to the Sebastopol community. SPD officers serve a variety of roles including patrol, K-9, drug disposal services, code violations, pet return for lost and found pets, Animal Control services, issuances of various permits, investigations, communications, and school resources.

The SPD operates out of one station located at 6850 Laguna Park Way, approximately 1.1 miles east of the project site. As of 2020, the SPD was staffed with 14 full-time sworn officers, which includes the police chief, police lieutenant, four (4) police sergeants, and eight (8) police officers. SPD has six (6) non-sworn support staff, which included a dispatch/records supervisor, five (5) communication dispatchers, and a part-time police technician to conduct parking and animal control functions and assist with fingerprinting services. SPD also has four (4) reserve police officers, and four community service volunteers (City of Sebastopol 2021a). The average response for all Priority 1 (emergencies) calls in 2020 was 2 minutes and 58 seconds, from the time of dispatch to the time of arrival of officers at the scene of emergency. The average time for the communications dispatcher to answer an emergency call for service, gather required information from the caller, and dispatch necessary resources to the scene was 51 seconds (City of Sebastopol 2021). The standard for police service in the city is a response time of three minutes for 70 percent of emergency calls (City of Sebastopol 2016).

c. Schools

Sebastopol Union School District (SUSD) provides elementary school (kindergarten through 12th grade. There are three schools in SUSD, two of which are in the city: Park Side Elementary School and Brook Haven School. The SUSD had a total of 438 students in the 2021-22 school year with an average student to teacher ratio of 19.47 (National Center for Education Statistics [NCES] 2022a). The City of Sebastopol is also supported by the West Sonoma County High School District (WSCHSD), which contains two schools, Analy High School, located in the eastern portion of Sebastopol, and Laguna High School, located north of Sebastopol in Forestville. Between the two high schools, there were a total of 1,664 students enrolled in the 2021-22 school year with an average student to teacher ratio of 18.17 (NCES 2022b).

d. Parks and Recreation

Sebastopol has multiple recreational opportunities, including some provided by local nonprofits and private developments. Parks, recreational and open spaces within the city include: the town Plaza; the Laguna Wetlands Preserve; the Laguna Skategarden Park; the Laguna Uplands; the Railroad Forest bike path connector; Tomodachi Park; and the Barlow green. Sebastopol has approximately 36.3 acres of developed parkland, and approximately 240 acres of undeveloped park space. Much of the undeveloped park space contains developed trails that count toward developed parkland within the city. A summary of existing parks within the city and notable amenities, including locations and acreages is provided in Table 4.12-1.

Table 4.12-1 Existing Park Facilities

Park	Location	Acreage	Facilities
Ives Park	7400 Willow Street	6.4	Swimming pool, baseball field, play structure, ponds, stage area, grass fields, picnic areas, restrooms, and 3 bridges
Laguna de Santa Rosa Wetlands Preserve	Adjacent to Laguna Youth Park	81	Passive recreation uses: Trails, outdoor classroom for 50, and wildlife observation areas
Laguna Youth Park	Adjacent to Community Center	6.0	Two baseball fields, play structure, and picnic areas.
Gold Ridge Experiment Farm	777 Bodega Avenue	3.2	Cottage, walking trails, and historical plantings
Skategarden Park	6750 Laguna Park Way	1.1	Skate structure, 23 garden plots, art wall, and chess table
Spooner Park	910 South Main Street	0.5	Grass, solar panels, and ‘welcome’ sign
Tomodachi Park	6665 Sebastopol Avenue	8.7	Picnic area, short walking trail in Oak Woodland area
Mario Savio Free Speech Town Plaza	6901 McKinley Street	0.9	Gazebo, fountain, benches, and restrooms
Libby Park	7985 Valentine Avenue	5.5	Parks Play structure, bocce ball court, volleyball court, gazebo, pond, and Garzot Community Building

Park	Location	Acreage	Facilities
Laguna Uplands	Adjacent to the former Palm Drive Hospital	8.0	Natural Laguna landscape, short walking trail, and outdoor classroom/helicopter landing area
Ragle Ranch Regional Park	500 Ragle Road	155.9	Regional park with soccer fields, tennis courts, play structure, pond, picnic areas, dog park, extensive walking trails
Total Park Acreage		**277.2**	

Source: City of Sebastopol. 2025. 2016 Sebastopol General Plan EIR. Accessed August 2023.

In addition to the parks in Table 4.12-1, Sebastopol has several trails located within the Laguna de Santa Rosa Wetlands, the Railroad Forest, and in West County Trail. West County Trail is the nearest trail to the project site, located directly adjacent to the north of the project site.

There are several parks located near the project site that may be used by future residents. Ragle Ranch Regional Park is located approximately 0.6 mile southwest of the project site, Libby Park is located approximately 0.7 mile south of the project site, and Ives Park is located 1.2 miles southeast of the project site. While not a park, the Ceres Community Garden is also located approximately 0.1 mile southeast of the project site.

e. Library Services

The Sebastopol Library is the only public library located in the City of Sebastopol. The Sebastopol Library is part of the Sonoma County Library system, which enables the relatively small Sebastopol Library to access all of the other libraries that are part of the Sonoma County Library system. The Sebastopol Library is located at 7140 Bodega Avenue. The library is open from 10 a.m. to 6 p.m. Tuesdays, Thursday, and Fridays, from 10 a.m. to 8 p.m. on Wednesdays, and from 10 a.m. to 4 p.m. on Saturdays. The library collection includes materials in both Spanish and English. It also offers a wide variety of media, including DVDs, CDs and audiobooks, as well as a large print collection. The library offers a number of programs for all ages, including families, children, teens, and adults. This library is located approximately 1.1 miles southeast of the project site. The Sonoma County Library system serves more than 485,000 residents in Sonoma County. The Sebastopol Regional Library averaged approximately 17,884 monthly visits between 2014 and 2015 (Sonoma County Library 2016).

4.12.2 Regulatory Setting

a. Federal Regulations

There are no federal regulations that would be applicable to the project.

b. State Regulations

California Fire and Building Codes

The State of California provides minimum standards for building design through the California Building Code (CBC), which is located in Part 2 of Title 24, California Building Standards Code, of the California Code of Regulations. The CBC is based on the International Building Code but has been amended for California conditions. It is generally adopted on a jurisdiction-by-jurisdiction basis, subject to further modification based on local conditions. Commercial and residential buildings are plan-checked by local building officials for compliance with the CBC. Typical fire safety requirements of the CBC include: the installation of sprinklers in all high-rise 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.

California Code of Regulations

The California Code of Regulations, Title 5 Education Code, governs all aspects of education within the State. California State Assembly Bill 2926 (AB 2926) – School Facilities Act of 1986 – was enacted by the State of California in 1986 and added to the California Government Code (Section 65995). It authorizes school districts to collect development fees, based on demonstrated need, and generate revenue for school districts for capital acquisitions and improvements. It also established that the maximum fees which may be collected under this and any other school fee authorization are $1.50 per square foot for residential development and $0.25 per square foot for commercial and industrial development. AB 2926 was expanded and revised in 1987 through the passage of AB 1600, which added Section 66000 et seq. of the Government code. Under this statute, payment of statutory fees by developers serves as total mitigation under CEQA to satisfy the impact of development on school facilities. However, subsequent legislative actions have alternatively expanded and contracted the limits placed on school fees by AB 2926.

California Senate Bill 50

As part of the further refinement of the legislation enacted under AB 2926, the passage of SB 50 in 1998 defined the Needs Analysis process in government Code Sections 65995.5-65998. Under the provisions of SB 50, school districts may collect fees to offset the costs associated with increasing school capacity as a result of development. SB 50 generally provides for a 50/50 State and local school facilities 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 schools, and the percentage of moveable classrooms in use.

California Government Code sections 65995-65998 sets forth provisions to implement SB 50. Specifically, in accordance with section 65995(h), the payment of statutory fees is “deemed to be full and complete mitigation of the impacts of any legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property, or any change in governmental organization or reorganization…on the provision of adequate school facilities.” The school district is responsible for implementing the specific methods for mitigating school impacts under the Government Code.

Pursuant to Government Code section 65995(i), “A State or local agency may not deny or refuse to approve a legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property, or any change in governmental organization or reorganization as defined in section 56021 or 56073 on the basis of a person's refusal to provide school facilities mitigation that exceeds the amounts authorized pursuant to this section or pursuant to section 65995.5 or 65995.7, as applicable.”

California Education Code section 17620(a)(1) states that the governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement against any construction within the boundaries of the district, for the purpose of funding the construction or reconstruction of school facilities. The City of Sebastopol has developed a school impact fee which requires a payment of $2.41 per square foot of residential development (City of Sebastopol 2021b).

c. Regional and Local Regulations

City of Sebastopol General Plan

The City's Community Services and Facilities Element of the 2016 General Plan includes the following goals (City of Sebastopol 2016):

Goal CSF 1: Provide high quality community services, facilities, and infrastructure to all residents, businesses, and visitors in Sebastopol.

Goal CSF 2: Provide a diversified and high-quality public park and trail system that provides active and passive recreational opportunities for all segments of the community and provides enhanced connectivity between key residential, commercial, and recreational areas of the city.

Goal CSF 3: Provide an adequate, clean, safe, and environmentally sound water supply to all existing and future water users in Sebastopol.

Goal CSF 4: Provide adequate sewer service capacity to serve existing and future demands.

Goal CSF 5: Provide effective, high quality, and responsive police and fire services to all areas of the city.

Goal CSF 6: Enhance the quality of life for all city residents through the provision of cultural and social resources including quality schools, libraries, and other community services and facilities.

Impact Fees

City of Sebastopol Municipal Code (SMC)

SMC Chapter 3.34 Fire Facilities Fee

SMC Chapter 3.34 requires that fire facilities fee is paid to finance and to fund fire facilities that are required to mitigate the impacts of new development on the City's infrastructure in order to meet required response times. Fire facilities fees collected are utilized to fund new fire facilities necessary to maintain the existing level of service the City provides, to include equipment such as fire engines and fire station building facilities.

SMC Chapter 3.38 General Government Facilities Impact Fee

SMC Chapter 3.38 requires that a general government facilities impact fee is paid to finance and to fund expansion of government facilities that are required to mitigate the impacts of new development on the City's infrastructure. Through the City's capital improvement plan process, these funds go towards the expansion of government facilities to maintain the existing level of service the City provides. "General government facilities" includes city hall, corporation yard, senior centers, police stations, museums, youth centers, and any other government facilities not addressed by other impact fees.

SMC Chapter 3.50 In-Lieu Fees for School Facilities

SMC Chapter 3.50 requires that an in-lieu of fee for school facilities is paid to finance and fund the expansion of school facilities that are required to mitigate the impacts of new development. Every owner or developer of a residential development situated or served by an attendance area where overcrowding exists must dedicate land, pay fees in-lieu thereof, or a combination of both for classroom facilities for elementary and/or high schools as a condition to the approval of a residential development.

SMC Chapter 17.280 Park and Recreation Land Dedication and Fees

SMC Chapter 17.280 requires that all new development projects and subdivisions shall provide park and recreation space at a minimum of five acres for each 1,000 persons within the City. A developer would be required to dedicate land, pay a fee in lieu thereof, or both, for neighborhood or community parks or recreational facilities. Funds collected through the in lieu of fee will be used only for the purposes of developing new and rehabilitating existing parks or recreational facilities to serve new development, pursuant to Government Code Section 66477(a)(3). The City has an adopted Development Impact Fee Study (2021) which outlines the impact fee paid to finance and to fund expansion of parkland and development of facilities within parkland within the City.

4.12.3 Impact Analysis

a. Significance Thresholds and Methodology

Significance Thresholds

CEQA Guidelines Appendix G identifies the following criteria for determining whether a proposed project's impacts would have a significant impact related to public facilities. Would the proposed project:

1. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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 following public services:
    a. Fire Protection
    b. Police Protection
    c. Schools
    d. Parks
    e. Other public facilities

Methodology

Impacts on fire and police protection services are considered significant if an increase in population or development levels would result in inadequate staffing levels, response times, and/or increased demand for services that would require the construction or expansion of new or altered facilities that have an adverse physical effect on the environment. Impacts on schools are determined by analyzing the project's effect on the capacity at existing SUSD schools. The analysis considers whether an increase in use of the City's parks and recreation facilities resulting from the project would cause the substantial physical deterioration of those facilities (e.g., disturbance of vegetation, accelerated wear on sports facilities and fields, erosion along trails, and an increased potential for increased graffiti and litter) or in the need for new or expanded facilities. The analysis further considers whether the project would diminish or otherwise adversely affect recreational opportunities and existing facilities in the vicinity of the project site, based on existing issues with facility capacity. Impacts on library services are considered significant if an increase in population or development levels would result in an increased demand for library services that would require the need for new or physically altered library facilities to maintain acceptable service ratios, the construction of which could result in substantial adverse environmental effects.

b. Project Impacts and Mitigation Measures

Threshold 1a:	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities, or the need for new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

Impact PS-1 **THE PROPOSED PROJECT WOULD NOT RESULT IN SUBSTANTIAL ADVERSE PHYSICAL IMPACTS ASSOCIATED WITH THE PROVISION OF NEW OR PHYSICALLY ALTERED FIRE PROTECTION FACILITIES, OR NEED NEW OR PHYSICALLY ALTERED FIRE PROTECTION FACILITIES. IMPACTS WOULD BE LESS THAN SIGNIFICANT.**

As discussed in Section 4.11, *Population and Housing,* the project would result in approximately 204 new residents within the city. Development of the proposed project would increase the city's population from 7,733 to 7,637 residents. This would represent an increase of approximately 2.7 percent. The addition of new residents may increase the number and frequency of calls to the fire department. Development facilitated by the project would increase calls for service at the project site for issues including (but not limited to) emergency medical service, structure or vegetation fires, and traffic collisions. Since the proposed project is within 1.1 miles of the SFD station, emergencies on the project site would generally be responded to within current response times.

The project would be required to meet the standard fire code safety and access requirements administered by the City of Sebastopol Building and Safety Department and specified by the CBC. In accordance with standard practices, SFD would review project plans before permits are issued to ensure compliance with all applicable fire and building code standards and ensure adequate emergency access is provided to the site. In addition, the City of Sebastopol has developed impact fees for new development as detailed in Chapter 3.34of the SMC. The fee is utilized for the provision of resources for the SFD. Since the project would be served by existing services, and because the applicant would pay the required development fee, which would provide funding to support SFD operations, a new or physically altered fire station would not be required due to the project. As such, impacts on fire services because of the project would be less than significant.

Mitigation Measures

No mitigation measures would be required.

Significance After Mitigation

Impacts would be less than significant with no mitigation required.

Threshold 1b:	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities, or the need for new or physically altered police protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

Impact PS-2 THE PROPOSED PROJECT WOULD NOT RESULT IN SUBSTANTIAL ADVERSE PHYSICAL IMPACTS ASSOCIATED WITH THE PROVISION OF NEW OR PHYSICALLY ALTERED POLICE PROTECTION FACILITIES OR NEED NEW OR PHYSICALLY ALTERED POLICE PROTECTION FACILITIES. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The addition of 204 new residents may increase the number and frequency of calls to the police department. Development of the proposed project would increase the city's population from 7,733 to 7,637 residents. This would represent an increase of approximately 2.7 percent. Development facilitated by the project would increase the number of annual incidents. Since the project site is within SPD's existing service area and 1.1 miles from the SPD police station, emergencies on these sites would generally be responded to within current response times.

The City has adopted a general government facilities fee pursuant to Chapter 3.38 of the SMC. The project would be required to pay this impact fee. The fee is utilized for the provision of additional supplies and staff at the police station. Applying required development impact fees to the project would minimize incremental impacts caused by the project. Since the project would be served by existing services, and because future applicants would pay the General Government Facilities Fee, which would provide funding to support SPD operations, a new or physically altered police station would not be required due to the project. As such, impacts on police services because of the project would be less than significant.

Mitigation Measures

No mitigation measures would be required.

Significance After Mitigation

Impacts would be less than significant with no mitigation required.

Threshold 1c:	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered schools, or the need for new or physically altered schools, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives?

Impact PS-3 THE PROPOSED PROJECT WOULD NOT RESULT IN SUBSTANTIAL ADVERSE PHYSICAL IMPACTS ASSOCIATED WITH THE PROVISION OF NEW OR PHYSICALLY ALTERED SCHOOLS OR NEED NEW OR PHYSICALLY ALTERED SCHOOLS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The project would slightly increase the number of school-aged children in Sebastopol. In 2021, the SUSD enrolled 463 students. Based on the City's current population of 7,433 residents, this would account for a six percent enrollment rate. Assuming the proposed project will have a similar proportion of school-aged children, the anticipated number of new students is approximately 13.[1]

[1] 463 students/ 7,433 residents = 0.06 or six percent. 204 new residents x 0.06 = 12.7 (rounded up to a whole person value).

Given that the City experienced a reduction in the number of students enrolled in recent years, following State and federal trends, the SUSD should be able to accommodate a slight increase in the total number of students induced by the project.

In addition, to offset a future project's potential impact to schools, Government Code 65995 (b) establishes the base amount of allowable developer fees a school district can collect from development projects located within its boundaries. The fees obtained by SUSD and WSCHSD are used to maintain the desired school capacity and the maintenance and/or development of new school facilities. The project would be required to pay the SUSD and WSCHSD school impact fees. Pursuant to Section 65995 (3)(h) of the California Government Code (Senate Bill 50, chaptered August 27, 1998), the payment of statutory fees "is deemed to be full and complete mitigation of the impacts of any legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property, or any change in governmental organization or reorganization." Therefore, existing laws and regulations would require funding for the provision or expansion of new school facilities to offset impacts from the project and impacts would be less than significant.

Mitigation Measures

No mitigation measures would be required.

Significance After Mitigation

Impacts would be less than significant with no mitigation required.

Threshold 1d:	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered parks, or the need for new or physically altered parks, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives?

Impact PS-4 THE PROPOSED PROJECT WOULD NOT RESULT IN SUBSTANTIAL ADVERSE PHYSICAL IMPACTS ASSOCIATED WITH THE PROVISION OF NEW OR PHYSICALLY ALTERED PARKS OR NEED NEW OR PHYSICALLY ALTERED PARKS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

As required by Chapter 17.28 of the SMC, all new residential development projects and subdivisions are required to provide park and recreation property at a minimum of five acres for each 1,000 persons within the City. In-lieu of fees for multifamily developments are calculated from the maximum density permitted in the proposed district, including any density bonus. For tentative parcel maps in multifamily districts, a condition may be added to the tentative parcel map stating that the number of dwelling units may be calculated using the density tentatively approved. Payment of the in-lieu of fees or dedication of parkland or open space to maintain the minimum park to resident ratio would sufficiently mitigate any growth and impacts to parks induced by the proposed project.

In order to maintain the required level of service, the project would be required to provide a minimum of 1.02 acre of open space for the 204 new residents induced by the project. The proposed project would provide approximately 107,200 square feet (2.5 acres) of common open space and 216 square feet of private open space per dwelling unit. Payment of an in lieu of fee or dedication of land for recreational facilities would also be required in order to accommodate future expansion of open space facilities. Funds collected through the in lieu of fee would be used only for the purposes of developing new and rehabilitating existing parks or recreational facilities to serve new development, pursuant to Government Code Section 66477(a)(3). Therefore, new or physically altered parks would not be required for the project and impacts would be less than significant.

Mitigation Measures

No mitigation measures would be required.

Significance After Mitigation

Impacts would be less than significant with no mitigation required.

Threshold 1e:	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered public facilities, or the need for new or physically altered public facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

Impact PS-5 THE PROPOSED PROJECT WOULD NOT RESULT IN SUBSTANTIAL ADVERSE PHYSICAL IMPACTS ASSOCIATED WITH THE PROVISION OF NEW OR PHYSICALLY ALTERED PUBLIC FACILITIES OR NEED NEW OR PHYSICALLY ALTERED PUBLIC FACILITIES. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Development facilitated by the project would be expected to increase demand for library services. Pursuant to the City's General Government Facilities Fee, the project would be required to pay a per-unit fee (City of Sebastopol 2021b). These fees are collected and used to provide library services in the City, among other services. While library services demand may increase slightly because of the project, the project would not require the expansion of library facilities. Thus, impacts would be less than significant.

Mitigation Measures

No mitigation measures would be required.

Significance After Mitigation

Impacts would be less than significant with no mitigation required.

4.12.4 Cumulative Impacts

The geographic scope of the cumulative public services analysis is the service area for the City of Sebastopol. Cumulative development projects would all place a demand on police, fire, school, and library services. The City has developed impact fees that help fund police, fire, school, and library services and which help ensure that these services have sufficient equipment and capacity to meet the incremental demand from each cumulative project. As such, cumulative impacts on these public services would be less than significant. In addition, a cumulative impact on police, fire, school, and library services would only be significant if an expanded or new facility would be needed, such that it resulted in a physical impact on the environment. At this time, no plans have been identified for expanded police, school, or library facilities. When plans for an expanded or new facility are identified for any public service, CEQA review would be conducted and the potential physical impacts on the environment would be assessed.

The geographic scope of the cumulative recreation analysis is the City. Cumulative development projects, especially residential projects, would increase residences in the City, which could place an additional demand on recreational facilities. The City has developed a Parks and Recreation fee and land dedication process, which requires the applicants for new residential projects to pay this fee or dedicate land, which will fund park acquisition, park development, community gym, and the aquatic center. Payment of the Parks and Recreation fee would help ensure sufficient recreational resources for any new growth associated with the project. Furthermore, it is expected that open space would be included for cumulative residential projects to comply with zoning requirements. Overall, cumulative recreational impacts would be less than significant.

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4.13 Transportation

This section analyzes the potential impacts of the project on transportation, including conflicts with transportation plans, vehicle miles traveled (VMT), project-related transportation hazards, and emergency access, associated with the implementation of the proposed project. For informational purposes, effects to the local transportation and circulation system are also addressed. The analysis in this section is primarily based on a Transportation Impact Study prepared for the project by W-Trans (W-Trans 2023), which is included as Appendix G to this EIR.

4.13.1 Setting

a. Existing Local Roadway Network

Roadways in proximity to the project site include:

1. **SR 116 (Gravenstein Highway North)/Occidental Road** is a four-way signalized intersection located outside of the Sebastopol City limits. Crosswalks with pedestrian phasing are present on all but the south leg. Protected left-turn phasing is present on the northbound and southbound approaches and the eastbound and westbound approaches are split-phased.
2. **SR 116 (Gravenstein Highway North)/Mill Station Road** is a four-way signalized intersection with marked crosswalks and pedestrian phasing on all but the south leg. Protected left-turn phasing is present on the northbound and southbound approaches and the eastbound and westbound approaches are split-phased.
3. **SR 116 (Gravenstein Highway North)/Hurlbut Avenue** is a signalized four-way intersection with marked zebra crosswalks on all four legs. Protected left-turn phasing is present on the northern and southern approaches and pedestrian phasing is present on all four legs. Class II bike lanes are available on the north and south legs of the intersection.
4. **SR 116 (Gravenstein Highway North-Healdsburg Avenue)/Covert Lane** is a T-intersection with stop controls on the Covert Lane approach. Covert Lane runs east-west, but it curves to the north as it approaches SR 116. East of Covert Lane, SR 116 runs east-west, but it curves to the north to the west of Covert Lane. Class II bike lanes exist on both sides of the north leg of SR 116 and exist on the southwest side of SR 116 on the south leg. There are no marked crosswalks on any legs of the intersection.
5. **SR 116 (Healdsburg Avenue)/Murphy Avenue** is a three-way intersection with the stop control on the northbound Murphy Avenue approach. Marked crosswalks exist on the west and south legs of the intersection. Class II bike lanes exist on the east and west legs of the intersection, while there are sharrow markings on the south leg. Yield markings are on the east and west legs approaching the intersection and Rectangular Rapid Flashing Beacons (RRFB) are present on the west leg.
6. **SR 116 (Healdsburg Avenue-North Main Street)/North Main Street** is a signalized T-intersection with zebra crosswalks and pedestrian phasing on the north and east legs. Protected left-turn phasing exists on the eastern approach of the intersection. North Main Street curves to the west as it approaches Healdsburg Avenue and continues north. Class II bike lanes are present on the north side of the east leg, both sides of the west leg, and Class II bike lanes are present on both sides of the north leg.

b. Traffic Conditions

Analysis Methodology

This section uses the metric of VMT, as described below, to analyze transportation-related impacts consistent with Senate Bill 743 and the state CEQA guidelines. Pursuant to California Public Resources Code section 21099(b)(2) and CEQA Guidelines Section 15064.3, "a project's effect on automobile delay shall not constitute a significant environmental impact." Because the City of Sebastopol has updated its CEQA thresholds in accordance with state regulations, this analysis does not make significance conclusions with respect to impacts related to automobile delay, which is typically described as "Level of Service" (LOS). Although LOS is no longer the City's metric for analyzing traffic impacts under CEQA, Appendix G describes traffic operations at the studied intersections in terms of LOS for informational purposes.

Vehicle Miles Traveled

"Vehicle miles traveled" refers to the amount and distance of automobile travel "attributable to a project." VMT re-routed from other origins or destinations as the result of a project would not be attributable to a project except to the extent that the re-routing results in a net increase in VMT. Daily VMT per resident is the average number of vehicle miles that a resident in a given area travels per day. One factor that leads to a higher relative daily VMT per resident is an imbalance of jobs and housing availability in an area. The project site is located within traffic analysis zone (TAZ) 803, which has a baseline VMT per capita of 15.57 miles.

c. Transit and Access Circulation

Sonoma County Transit

Sonoma County Transit (SCT) provides fixed-route bus service in Sebastopol and surrounding areas. SCT Route 20, Route 24, and Route 26 all have stops within a half mile of the project site. Route 20 runs from the Coddingtown Mall in the City of Santa Rosa to Monte Rio in the Russian River Area. Route 24 runs from the Sebastopol Transit Hub in downtown Sebastopol to the intersection of SR 116/Mill Station Road (at the project site frontage), and Route 26 operates on school days only with one bus run in each direction per day, at 7:22 a.m. and 3:38 p.m. Existing transit routes and details regarding their operation are summarized in Table 4.13-1.

Table 4.13-1 Transit Routes

		Service			
Transit Agency Route	Distance to Stop (mi)[1]	Days of Operation	Time	Frequency	Connections
Sonoma County Transit					
Route #20	<0.1	Mon-Fri	6:30 a.m. – 9:30 p.m.	50 – 80 min	Monte Rio
		Sat-Sun	6:30 a.m. – 9:30 p.m.	50 – 105 min	Coddington/Santa Rosa
Route #24	<0.1	Mon-Fri	7:45 a.m. – 6:30 p.m.	45 – 55 min	Sebastopol
		Sat	7:45 a.m. – 5:30 p.m.	45 – 55 min	SR 116/Mill Station Road
Route #26	<0.1	School Days	7:22 a.m.	1 run	Mirabel Park
			3:38 p.m.	1 run	Sonoma State Univ.

Sources: W-Trans 2023; Appendix G

Two bicycles can be carried on most SCT buses, and bike rack space is provided on a first-come, first-served basis. Additional bicycles are allowed on SCT buses at the discretion of the bus operator.

Dial-a-ride, also known as paratransit or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. SCT Paratransit is designed to serve the needs of individuals with disabilities within the City of Sebastopol and the greater Sonoma County area.

d. Pedestrian Conditions

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. Existing pedestrian facilities along the proposed project site frontage as well as within a one-quarter mile distance of the project site were reviewed.

A generally connected pedestrian network currently exists along SR 116 near the project site. However, there is no sidewalk on the west side of SR 116 north of its intersection with Danmar Drive. Sidewalks are present on the east side of SR 116 south of its intersection with Mill Station Road, and the West County Trail follows the east side of SR 116 north of Mill Station Road. As part of the project, pedestrian paths would be built to connect the project site to the existing pedestrian network on the east side of SR 116. One pedestrian path would be located along the southeastern boundary of the project site and connect to the existing sidewalk on SR 116, and one would be located on the north side of the project site and connect to the West County Trail.

Caltrans has recently solicited bids for a project to install a new crosswalk with a HAWK (Pedestrian Hybrid Beacon) signal across the north leg of the intersection of SR 116/Danmar Drive. It is expected that this Caltrans-funded improvement will be installed before the end of 2023.

e. Bicycling Conditions

The *Highway Design Manual 7th Edition*, Caltrans, 2020, classifies bikeways into four categories:

- **Class I Multi-Use Path.** A completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane.** A striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route.** Signing only for shared use with motor vehicles within the same travel lane on a street or highway.
- **Class IV Bikeway.** Also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

In the project vicinity there are several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County Trail, which runs between Occidental Road and North Main Street. There are existing bicycle lanes along SR 116 between the north city limit and North Main Street, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116. There are also several Class III bike routes in the project vicinity, most of which feature sharrow pavement markings.

According to the Sebastopol Bicycle and Pedestrian Plan (2011), bike lanes are planned along Bodega Avenue between the City limits at Ragle Road east to High Street. These facilities are being constructed in two phases; with the eastern section (Phase 1) between High Street to Robinson/Nelson Ave scheduled for construction between 2023-2024; and Phase 2, from Robinson/Nelson to Pleasant Hill Road scheduled for construction between 224-2025, pending grant funding. Bike lanes are also planned along Mill Station and Ragle roads between SR 116 and Covert Lane. Class I facilities are planned adjacent to Occidental Road and Bodega Avenue, and a Class III route is planned on Mill Station Road west of Ragle Road. Bicyclists ride in the roadway and/or on sidewalks along all other streets within the project study area. Table 4.13-2 summarizes the existing and planned bicycle facilities in the project vicinity, as contained in the *Countywide Active Transportation Plan*.

Table 4.13-2 Bicycle Facilities in Project Vicinity

Facility	Class	Length (miles)	Begin Point	End Point
Existing				
West County Trail	I	1.68	Occidental Road	North Main Street
Occidental Road	II	1.83	Mill Station Road	High School Road
Covert Lane	II	0.50	Ragle Road	SR 116
SR 116 (Gravenstein Highway)	II	0.52	North City Limit	Covert Lane
SR 116 (Healdsburg Avenue)	II	0.64	Covert Lane	North Main Street
SR 116	II	0.95	Occidental Road	North City Limit
High School Road/North Main Street	II	1.56	Occidental Road	SR 116
Valentine Avenue	III	0.60	Ragle Road	Murphy Avenue
Danmar Drive/Norlee Street	III	0.48	SR 116	Covert Lane
Washington Avenue	III	0.56	Willard Libby Park	Bodega Avenue
Ragle Road	III	0.52	Covert Lane	Bodega Avenue
Pleasant Hill Avenue	III	0.50	Covert Lane	Bodega Avenue
Zimpher Drive	III	0.21	Covert Lane	Valentine Avenue
Murphy Avenue	III	0.38	SR 116	Valentine Avenue
Planned				
West County/Rodota Trail	I	0.91	West County (west segment)	SR 116
Bodega Avenue	I	0.29	Atascadero Creek	Ragle Road
Mill Station Road	II	0.26	Ragle Road	SR 116
Bodega Avenue	II	0.87	Ragle Road	Dutton Avenue-Jewell Avenue
SR 116 (Gravenstein Highway)	II	0.95	Occidental Road	North City Limit
Ragle Road	II	0.41	Mill Station Road	Covert Lane
Mill Station Road	III	1.91	Occidental Road	Ragle Road

Sources: W-Trans 2023; Appendix G

4.13.2 Regulatory Setting

This section describes applicable state, regional, and local laws, ordinances, regulations, and standards governing transportation and traffic, which must be adhered to before and during project implementation.

a. Federal Regulations

The US Department of Transportation (USDOT) provides a number of grant programs, primarily for the construction and upgrading of major highways and transit facilities. Many of these grants are administered by the State and local governments. Use of federal grant funding also invokes the National Environmental Protection Act (NEPA) in some cases. The Federal Highway Administration (FHWA) sets design standards (such as interchange spacing) for interstate highways, such as I-80. The Federal Railroad Administration within the USDOT establishes safety rules regarding the operation of railroads (e.g., maximum train speeds, maximum allowed highway crossing blockage time).

b. State Regulations

State Senate Bill 375

Senate Bill (SB) 375, signed in August 2008, directs each of the state’s 18 major Metropolitan Planning Organizations to prepare a “sustainable communities strategy” (SCS) that contains a growth strategy to meet emission targets for inclusion in the Regional Transportation Plan (RTP). On September 23, 2010, the California Air Resources Board (CARB) adopted final regional targets for reducing greenhouse gas (GHG) emissions from 2005 levels by 2020 and 2035.

The intent of SB 375 is to use the Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) to integrate regional land use, regional housing need allocations (RHNA), environmental, and transportation planning to ensure efficient regional planning in the future that leads to reduced greenhouse gas emissions from transportation and stationary sources. As a result of SB 375, preparation of local RHNA Plans are required to be coordinated and consistent with the RTP/SCS for the length of the housing element cycle. Local governments play a large role in helping to develop the transportation and land use scenarios used in the SCS development process.

State Senate Bill 743

Senate Bill (SB) 743 was signed into law by California Governor Jerry Brown in 2013 and tasked the State Office of Planning and Research (OPR) with establishing new criteria for determining the significance of transportation impacts under the California Environmental Quality Act (CEQA). SB 743 requires the new criteria to “promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.” It also states that alternative measures of transportation impacts may include “vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated.”

On September 27, 2013, Governor Brown signed SB 743 into law and started a process that changes transportation impact analysis as part of CEQA compliance. SB 743 requires the Governor’s OPR to identify new metrics for identifying and mitigating transportation impacts within CEQA. In January 2018, OPR transmitted its proposed CEQA Guidelines implementing SB 743 to the California Natural Resources Agency for adoption, and in January 2019 the Natural Resources Agency finalized updates to the CEQA Guidelines, which incorporated SB 743 modifications, and are now in effect. SB 743 changed the way that public agencies evaluate the transportation impacts of projects under CEQA, recognizing that roadway congestion, while an inconvenience to drivers, is not itself an environmental impact (Public Resource Code, § 21099 (b)(2)). In addition to new exemptions for projects consistent with specific plans, the CEQA Guidelines replaced congestion-based metrics, such as auto delay and level of service, with VMT as the basis for determining significant impacts, unless the Guidelines provide specific exceptions.

CEQA Guidelines Section 15064.3

Originating from SB 743, Section 15064.3 of the *CEQA Guidelines* establishes VMT as the most appropriate measure of transportation impacts, shifting away from the level of service (LOS) analysis that evaluated a project's impacts on traffic conditions on nearby roadways and intersections. Section 15064.3 does the following:

- Identifies VMT (amount and distance of automobile traffic attributable to a project) as the most appropriate measure of transportation impacts;
- Declares that a project's effect on automobile delay shall not constitute a significant environmental impact (except for projects increasing roadway capacity);
- Creates a rebuttable presumption of no significant transportation impacts for (a) land use projects within 0.5 mile of either an existing major transit stop or a stop along an existing high quality transit corridor, (b) land use projects that reduce VMT below existing conditions, and (c) transportation projects that reduce or have no impact on VMT;
- Allows a lead agency to qualitatively evaluate VMT if existing models are not available; and
- Gives lead agencies discretion to select a methodology to evaluate a project's VMT but requires lead agencies to document that methodology in the environmental document prepared for the project.

In December 2018, OPR issued a Technical Advisory on Evaluating Transportation Impacts in CEQA (OPR 2018). The technical advisory contains technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures. The technical advisory suggests a significance threshold for VMT that is based on state mandated GHG emission reduction targets. The technical advisory recommends a quantitative per capita or per employee VMT that is 15 percent below that of existing development as a possible threshold of significance that would comply with the state's long-term climate goals.

California Building Code

California provides minimum standards for building design through the California Building Code (CBC), which is located in Part 2 of Title 24 of the California Code of Regulations. The CBC is based on the 1997 Uniform Building Code with modifications specific for California conditions. The CBC provides fire and emergency equipment access standards for public roadways, which include specific width, grading, design and other specifications for roads which provide access for fire apparatus. Street modifications in the City of Sebastopol are subject to these and other modified State standards. The City of Sebastopol adopted the 2022 edition of the CBC in 2022.

c. Regional and Local Regulations

2016 Sebastopol General Plan

The City of Sebastopol General Plan (2016) sets forth the following guiding and implementing policies relevant to transportation and circulation:

Goal CIR 1: Provide a transportation system that promotes the use of alternatives to the single-occupant vehicle and facilitates the efficient and environmentally responsible movement of people and goods within and through the City of Sebastopol.

Policy CIR 1-2 Ensure that the City's circulation network is a well-connected system of streets, roads, sidewalks, multi-use trails, routes, and paths that effectively accommodates vehicular and non-vehicular traffic in a manner that considers the context of surrounding land uses and the needs of all roadway users.

Policy CIR 1-5 When analyzing impacts to the circulation network created by new development or roadway improvements, consider the needs of all users, including those with disabilities, ensuring that pedestrians, bicyclists, and transit riders are considered preeminent to automobile drivers.

Policy CIR 1-6 In evaluating circulation improvement needs, and in reviewing major development proposals, consider impacts for all modes of transportation, including pedestrians, bicyclists, transit, and vehicles.

Policy CIR 1-7 Projects that would substantially impact circulation conditions shall provide a circulation impact report. This report will serve as a decision-making tool for the City, recognizing that maintaining and improving the community's social fabric and economic vitality includes consideration of a project's effects on pedestrians, bicyclists, and transit as well as the overall effect of improvements associated with achieving appropriate Level of Service. LOS is not intended to be used as the primary method to limit the size or density of a project, but rather to provide decisionmakers with a picture of the impacts associated with a project and allow decision-makers to determine appropriate improvements to alleviate traffic impacts, to the extent appropriate and feasible. The Planning Department will determine whether a circulation impact report is required as part of the initial project application review process.

Circulation impact reports shall evaluate:

- Project effects on all modes of travel, including pedestrians, bicycles, transit, and vehicles;
- Improvements to accommodate the project with a focus on access and safety; and
- Impacts to vehicle travel, as determined by the Transportation Research Board's Highway Capacity Manual. This analysis is intended to provide a menu of potential improvements but should not mitigate LOS by reducing project size, either by intensity or density.

Decision-makers shall evaluate projects based on the merits of a project, including contribution to City character, and shall determine whether the City is best served by either implementing improvements to address potential circulation impacts or, if improvements are determined to not be appropriate or feasible, ensuring that a project provides a certain level of density and intensity, as envisioned by Figure 2-2 (Land Use Map) to contribute to the social fabric of the community and meet the City's goals for economic development, economic vitality, and adequate housing.

Multimodal improvements, traffic calming improvements, or other system-wide transportation network improvements may be required in lieu of requiring mitigations to the impacted road or intersection in order to reduce the overall impacts to mobility. This approach could apply to the use of traffic impact fees collected from developments as well.

Policy CIR 1-8 Establish multi-modal LOS objectives that would facilitate review of transit, bicycle and pedestrian impacts, in addition to motor vehicles when these methods are more available and useful.

Policy CIR 1-9 Through the development review process, CEQA process, and through long-range infrastructure planning efforts, identify circulation network improvements and mitigation measures necessary to maintain the City's vehicle, transit, bicycle and pedestrian objectives.

Policy CIR 1-14 Maintain and improve critical transportation facilities to provide logical emergency vehicle access and emergency evacuation needs.

Action CIR 1f As part of the development review process, the Planning Department, Public Works Department, Police Department, and Fire Department shall review development projects to ensure that developers:

- Construct transportation improvements along property frontages when appropriate
- Address the project's proportional-share of impacts to the City's circulation network through payment of traffic mitigation fees
- Provide for complete streets to the extent feasible; facilitating walking, biking, and transit modes
- Provide appropriate on-site pedestrian and bicycle features
- Fund traffic impact studies that identify on-site and off-site project effects and mitigation measures
- Provide adequate emergency vehicle access
- Minimize driveway cuts consistent with access and site planning considerations

Plan Bay Area 2050

The Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) are jointly responsible for long range planning in the San Francisco Bay Area, which includes Sonoma County and eight other counties. ABAG and MTC developed the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), a long-range regional transportation plan, required by state and federal law. The RTP/SCS, titled Plan Bay Area 2050, focuses on the sectors of housing, economic growth, transportation, and the environment and contains goals and policies regarding a compatible, regional transportation and transit system.

4.13.3 Impact Analysis

a. Significance Thresholds and Methodology

Significance Thresholds

Consistent with Appendix G of the State CEQA Guidelines, the project would have a significant impact on transportation if it would:

1. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities;
2. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b);
3. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment); or
4. Result in inadequate emergency access.

Methodology

The OPR Technical Advisory provides VMT threshold guidance for several land use types. Residential uses are assessed using a home-based VMT per capita metric, with VMT significance thresholds set at a level of 15 percent below the citywide or regional average. The Technical Advisory indicates that it may be appropriate to apply a countywide, rather than regional, average if most people both live and work within the smaller geographic area. According to data contained in the *Sonoma County Travel Behavior Study*, Sonoma County Transportation Authority (SCTA), 2020, approximately 98 percent of Sebastopol's vehicle trips remain within Sonoma County. Use of a common model to produce both project level and threshold values also allows for a clear "apples to apples" assessment. Accordingly, the applied significance threshold was based on the Sonoma County per-capita VMT average rather than the nine-County Bay Area regional average.

SCTA operates and maintains the regional travel demand model that produces baseline VMT estimates. The VMT thresholds and projections applied in this analysis reflect the SCTM19 model updated in December 2021, which remains the current version as of the August 2023 timeframe of this analysis. Based on output from the SCTA model, the existing average residential VMT per capita in the County of Sonoma is 16.60 miles. VMT significance thresholds are set at 15 percent below this level, or 14.11 miles. Accordingly, the project would have a potentially significant impact on VMT if its projected residential VMT per Capita exceeds 14.11 miles.

b. Project Impacts and Mitigation

Threshold 1:	Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Impact TRA-1 THE PROJECT WOULD CONFLICT WITH GENERAL PLAN ACTION CIR 1F RELATING TO PEDESTRIAN FACILITIES. INCORPORATION OF MITIGATION MEASURE TRA-1 WOULD ENSURE COMPLIANCE WITH ALL RELEVANT PLANS, PROGRAMS, ORDINANCES AND POLICIES. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED.

Transit Facilities

Given the size of the proposed project, there would not be substantial new demand for transit service generated by the development, though some residents or visitors may choose to use transit. The existing pedestrian facilities are adequate to provide access to the project site from the transit stops, and there are sufficient routes and headways to accommodate the nominal additional demand (Appendix G).

Existing public transit routes (refer to Section 4.13.1 above) are adequate to accommodate the additional demand generated by the project, and existing bus stops are accessible via continuous sidewalks. Transit facilities serving the project site are considered to be adequate, and the project would not conflict with any programs or policies regarding transit (Appendix G). Furthermore, the additional population and associated use by the project residents may contribute to the sustainability of ridership on these lines.

The proposed project would have a less than significant impact relative to transit facilities, as it would be consistent with existing plans, policies, and programs for these modes.

Roadway Facilities

The proposed project complies with Policy CIR 1-2 as the project does not inhibit any existing roadways within the vicinity of the project area. In addition, the proposed project enhances the roadway network by providing connectivity between the proposed project and the new HAWK crossing at SR 116/Danmar Drive. Thus, the proposed project is also compliant with General Plan Policies CIR 1-5, 1-6, 1-9, and General Plan Action CIR 1f. As discussed below under Impact TRA-4, site access and circulation would function acceptably for emergency response vehicles. Since emergency responders can claim the right-of-way through use of their lights and sirens, the addition of project-generated traffic would be expected to have little to no impact on emergency response times. Therefore, the proposed project would be in compliance with General Plan Policy CIR 1-14.

As noted previously, pursuant to Section 15064.3 of the *CEQA Guidelines*, traffic delay, which is what LOS measures and describes, shall not constitute a significant environmental impact for land use projects. However, General Plan Policy CIR1-7 requires projects with potentially significant impacts to circulation to provide a circulation impact report to provide decisionmakers with a picture of the impacts associated with a project and allow decision-makers to determine appropriate improvements to alleviate traffic impacts. In addition, General Plan Policy CIR 1-8 requires review of multi-modal LOS objectives where applicable. While that information may not be used to justify a significant impact, an LOS study has been provided in detail in the Transportation Impact Study (appendix G) for reference. Therefore, the proposed project would be consistent with all applicable General Plan policies and impacts would be less than significant.

Bicycle Facilities

The proposed project would be located in proximity to several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County Trail and existing bicycle lanes along SR 116 between Occidental road and the southern city limits, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116. The proposed project would also include 96 bicycle parking spaces and a bicycle repair station to promote bicycle travel, as well as multi-use path connections on the north side of the development to the West County Trail and on the east side of the project to Hurlbut Avenue and its easterly access to the West County Trail.

The project would not result in the construction of any new bicycle facilities. Existing and planned bicycle facilities would provide adequate access for bicyclists traveling to and from the project. The project would not conflict with any policies or plans for bicycle facilities (Appendix G).

Pedestrian Facilities

Pedestrian facilities serving the project site are adequate. The paths proposed and recommended as part of the project would provide adequate access to the existing pedestrian facilities, with the exception of connectivity to the new HAWK crossing across the north leg of the intersection of SR 116/Danmar Drive. General Plan Action CIR 1f requires that development projects “provide complete streets to the extent feasible; facilitating walking, biking, and transit modes” and requires that development projects “provide appropriate on-side pedestrian and bicycle features.” For this project, an appropriate feature would be a connection to the HAWK crossing. Therefore, the project would conflict with General Plan Action CIR 1f.

In order to adequately comply with Action CIR 1f, Mitigation Measure TRA-1 is required. Mitigation Measure TRA-1 would ensure that the proposed project include a new pedestrian path through the center of the site to link the project and mixed commercial office park to the new HAWK crossing.

Mitigation Measures

TRA-1 Pedestrian Connectivity and Safety

A new pedestrian path would be added through the center of the project site in order to link the project and mixed commercial office park to the new HAWK crossing across the north leg of the intersection of SR 116/Danmar Drive after Caltrans constructs the HAWK crossing and before an occupancy permit is issued.

Significance After Mitigation

Implementation of Mitigation Measure TRA-1 would ensure that the project would not result in a conflict with General Plan policies addressing the circulation system and would provide a safe crossing location for pedestrians. Impacts would be less than significant with mitigation incorporated.

Threshold 2:	Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Impact TRA-2 VEHICLE MILES TRAVELED (VMT) ATTRIBUTABLE TO THE PROPOSED PROJECT WOULD NOT EXCEED THE COUNTY'S THRESHOLDS FOR RESIDENTIAL PROJECTS. THEREFORE, THE IMPACT RELATED TO VMT WOULD BE LESS THAN SIGNIFICANT.

The SCTA model includes TAZs covering geographic areas throughout Sonoma County. Based on the model, for the project to achieve the applied threshold of 15 percent below the Countywide average, its projected VMT per capita would need to be reduced by 9.4 percent (Appendix G).

The residential density of the proposed project is 13.1 dwelling units per acre, and therefore, a reduction to the model's VMT was applied to capture VMT reductions associated with an increase in residential density over 9.69 units per acre.[1] Making VMT adjustments to account for characteristics such as density and affordability are standard practice and have been verified for applicability in Sonoma County by SCTA. The publication Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity, California Air Pollution Control Officers Association (CAPCOA), 2021, includes a methodology to determine the VMT reductions associated with increases in residential density.

Applying the CAPCOA density methodology results in a VMT reduction of 9.69 percent, or 1.51 VMT. Applying this percentage reduction yields an adjusted VMT value of 14.06, which is below the threshold of 14.11. Table 4.13-3 shows a summary of the VMT analysis in Appendix G. As shown therein, the project would have a less than significant impact on VMT as the project's VMT would be below the threshold of 15 percent below the Countywide average.

Table 4.13-3 Vehicle Miles Traveled Analysis Summary

			Project VMT per Capital	
VMT Metric	**Baseline VMT Rate**	**Significance Threshold**	**Project Site TAZ 803[1]**	**Meets Threshold?**
Residential VMT per Capita (Countywide baseline)	16.60	14.11	15.57	No
Applicable VMT Reduction	**Baseline Density (Countywide Average)**	**Project Density**	**Calculated VMT Reduction**	**Adjusted VMT**
Higher Density Residential	9.1 du/acre	13.1 du/acre	16.05 percent	14.06

Notes: VMT Rate is measured in VMT per Capita, or the number of daily miles driven per resident; TAZ = Traffic Analysis Zone[1]; du/acre = dwelling units per acre

Sources: W-Trans 2023; Appendix G

[1] In Section 2, *Project Description,* Table 2-1 states the project density is 13.1 dwelling units per acre. This density does not assume full buildout of the proposed ADUs..

Mitigation Measures

No mitigation would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 3:	Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?

Impact TRA-3 THE PROPOSED PROJECT WOULD NOT INTRODUCE DESIGN FEATURES OR INCOMPATIBLE USES THAT COULD INCREASE TRAFFIC HAZARDS. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

Primary access to the site would be provided at two locations: by an existing private drive that links the existing office development adjacent to the project to Mill Station Road and via the southernmost drive aisle of the office development's parking lot. A new curb cut and driveway would be created at the southernmost point of this drive aisle to provide more direct access to SR 116.

Sight distances along SR 116 at the proposed new project driveway at the southernmost parking lot drive aisle were evaluated based on sight distance criteria contained in the Highway Design Manual published by Caltrans. Based on a posted speed of 35 mph for SR 116, the minimum stopping sight distance needed is 250 feet (Appendix TRA). Field measurements indicate that sight distance at the driveways on SR 116 is over 300 feet in each direction and exceeds the stopping sight distance needed for vehicles traveling five mph above the posted speed limit of 35 mph. The sight distance at the private driveway location on Mill Station Road was field measured at 100 feet in each direction and does not meet the stopping sight distance requirement of 200 feet in each direction for five mph over the posted speed limit of 25 mph. This is an existing condition of the roadway and would not change as a result of the proposed project. Therefore, it is not an impact caused by the project. As landscaping and signage can impede sight lines, it is recommended in Appendix TRA, any landscaping or signage placed within the vision triangle at the driveway should be less than three feet or more than seven feet above the pavement surface to maintain a clear line of sight (Appendix TRA). Nevertheless, these impacts would be less than significant.

Mitigation Measures

No mitigation would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 4:	Would the project result in inadequate emergency access?

Impact TRA-4 THE PROPOSED PROJECT WOULD NOT RESULT IN INADEQUATE EMERGENCY ACCESS. THIS IMPACT WOULD BE LESS THAN SIGNIFICANT.

The project site would be accessed by an existing private road that connects to Mill Station Road to the northwest of the project site and by the access easement via the southernmost drive aisle of the parking lot of the adjacent development as well as a new driveway on SR 116 at the end of the project access drive aisle to provide direct access from the project to the street. The project would include a small private internal street network with a minimum travel width of 24 feet. This network and the parking stalls located therein are in accordance with City design standards. Site access and circulation would function acceptably for emergency response vehicles (Appendix TRA).

The proposed project is expected to generate an average 684 trips per day, including 44 a.m. peak hour trips and 54 trips during the p.m. peak hour on a typical day (Appendix TRA). The increase in traffic volumes resulting from the project can reasonably be expected to result in similarly nominal changes to traffic delays in the area. Since emergency responders can claim the right-of-way through use of their lights and sirens, the addition of project-generated traffic would be expected to have little to no impact on emergency response times. The project would have a less than significant impact on emergency response (Appendix TRA).

Mitigation Measures

No mitigation would be required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

4.13.4 Cumulative Impacts

The cumulative impacts assessment area for transportation include the City of Sebastopol and roadway network in proximity to the proposed project.

Individual planned and pending projects in Sebastopol would be assessed under CEQA for consistency with existing plans and programs related to pedestrian, transit, and roadway policies, which would ensure no significant cumulative impact would occur.

Cumulative projects would result in increased vehicle use on area roadways. The increased use of vehicles in the area would result in a correlating increase in VMT. Development of cumulative projects would increase VMT above existing conditions; therefore, cumulative impacts may be significant. For the purposes of determining consistency with SB 743, the project's potential VMT impacts are considered in the context of baseline conditions using a VMT per capita efficiency metric. With respect to cumulative impacts, the OPR Technical Advisory states, "A project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact. Accordingly, a finding of a less than significant project impact would imply a less than significant cumulative impact. The proposed project would contribute to this cumulative impact by adding to countywide VMT alongside other planned development nearby. As described under Impact TRA-2, the implementation of the project would not significantly increase the City's VMT. Therefore, the project would not result in a cumulatively considerable contribution to significant cumulative VMT impacts.

Impacts related to design hazards and emergency access are generally site specific, and cumulative impacts from planned development would not be significant. As described under Impacts TRA-3 and TRA-4, impacts related to these topics resulting from the proposed project would be less than significant.

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4.14 Tribal Cultural Resources

This section analyzes the proposed project's impacts on tribal cultural resources. Tribal cultural resources are those resources identified by California Native American tribes in consultation with lead agencies during tribal consultation [also referred to as Assembly Bill (AB) 52 consultation].

4.14.1 Regulatory Setting

a. Federal Regulations

National Historic Preservation Act

The National Historic Preservation Act (NHPA) was passed in 1966 to protect and preserve the nation's historical and cultural heritage. It established the National Register of Historic Places (NRHP), a comprehensive list of significant sites, buildings, and objects. The NHPA requires federal agencies to consider the impact of their activities on historic properties through a Section 106 review process. The Advisory Council on Historic Preservation (ACHP) was created to advise the President and Congress on preservation matters. State Historic Preservation Offices (SHPOs) work with the federal government to implement preservation programs at the state level. The NHPA provides tax incentives to encourage the rehabilitation of historic properties and supports tribal consultation for the preservation of Native American cultural heritage. Overall, the NHPA works to identify, protect, and enhance historic resources across the United States.

b. State Regulations

California Senate Bill 18 of 2004

California Government Code Section 65352.3 (adopted pursuant to the requirements of Senate Bill [SB] 18) 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. The tribal organizations eligible to consult have traditional lands in a local government's jurisdiction, and are identified, upon request, by the NAHC. As noted in the California Office of Planning and Research's Tribal Consultation Guidelines (2005), "The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places." SB 18 refers to PRC Sections 5097.9 and 5097.995 to define cultural places as a Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine (PRC Section 5097.9) and Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the CRHR pursuant to PRC Section 5024.1, including any historic or prehistoric ruins, any burial ground, and any archaeological or historic site (PRC Section 5097.995).

California Assembly Bill 52 of 2014

California Assembly Bill 52 (AB 52) expanded CEQA by defining a new resource category, "tribal cultural resources." AB 52 establishes 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" (PRC Section 21084.2). It further states the lead agency shall establish measures to avoid impacts that would alter the significant characteristics of a tribal cultural resource, when feasible (PRC Section 21084.3).

PRC Sections 21074(a)(1)(A) and (B) define tribal cultural resources as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" and are:

> 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
>
> A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). In applying these criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.

AB 52 also establishes a formal consultation process for California tribes regarding tribal cultural resources. The consultation process must be completed before a CEQA document can be adopted or certified. Under AB 52, lead agencies are required to begin consultation with California Native American tribes that are "traditionally and culturally affiliated with the geographic area of the proposed project." Native American tribes to be included in the process are those that have requested notice of projects proposed within the jurisdiction of the lead agency.

California Register of Historical Resources

The California Register of Historical Resources (CRHR) is a state-level listing of significant historical and cultural resources in California. Administered by the California Office of Historic Preservation (OHP). The CRHR was created to identify historical resources deemed worthy of preservation on a state level and was modeled closely after the NRHP. The criteria are nearly identical to those of the NRHP but focus on resources of statewide, rather than national, significance. The CRHR automatically includes any resource listed, or formally designated as eligible for listing in the NRHP, including tribal resources.

c. Local Regulations

Sebastopol Municipal Code 2016

Chapter 17.150 Cultural Heritage of the City of Sebastopol Municipal Code Ordinance authorizes the Planning Commission, or City Council on appeal, to designate (or remove) local landmarks and sites of historic interest by the procedures outlined in the ordinance. Tribal cultural resources are not addressed.

2016 Sebastopol General Plan

The Sebastopol General Plan, adopted in 2016, provides a comprehensive framework that guides the City's development. The Conservation and Open Space Element establishes goals and policies to protect cultural resources that could be considered tribal cultural resources within Sebastopol.

Goal COS 10: Protect and Preserve Sebastopol's Historic and Cultural Resources

> **Policy COS 10-1**: Review proposed developments and work in conjunction with the California Historical Resources Information System, Northwest Information Center at Sonoma State University, to determine whether project areas contain known archaeological resources, either prehistoric and/or historic-era, or have the potential for such resources.

Policy COS 10-2: If found during construction, ensure that human remains are treated with sensitivity and dignity, and ensure compliance with the provisions of California Health and Safety Code and California Public Resources Code.

Policy COS 10-3: Work with Native American representatives to identify and appropriately address, through avoidance or mitigation, impacts to Native American cultural resources and sacred sites during the development review process.

Policy COS 10-4: Consistent with State local and tribal intergovernmental consultation requirements, the City shall consult with Native American tribes that may be interested in proposed new development and land use policy changes.

Actions in Support of Goal COS 10

Action COS 10a: Work with the Federated Indians of the Graton Rancheria to prepare a narrative description of the Native American background of the Sebastopol area and request the Federated Indians of the Graton Rancheria provide pictorial examples of the types of Native American resources present in the vicinity. Place this description on the City's website as a link under the History of Sebastopol section.

Action COS 10b: Require a cultural and archaeological survey prior to approval of any development project where a potential or known historical, archaeological, or other cultural resource is located or which would require excavation in an area that is sensitive for cultural or archaeological resources. If significant cultural or archaeological resources, including historic and prehistoric resources, are identified, the project shall be required to implement appropriate measures, such as avoidance, capping of the resource site, or documentation and conservation, to reduce adverse impacts to the resource to a less than significant level.

Action COS 10c: Require all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources or human remains:

- If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Planning Department shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Planning Department.
- If human remains are discovered during any ground disturbing activity, work shall stop until the Planning Department and the County Coroner have been contacted; if the human remains are determined to be of Native American origin, the Native American Heritage Commission (NAHC) and the most likely descendants have been consulted; and work may only resume when appropriate measures have been taken and approved by the Planning Department.

Action COS 10d: Continue to invite the Federated Indians of the Graton Rancheria, as well as other recognized tribes that express interest, to comment on City projects as part of the environmental review process.

Action COS 10g: Encourage and support local and non-profit efforts to publicize and educate regarding local history and culture. Key historical resources, groups, and time periods to emphasize may include, but are certainly not limited to: the railroad culture and history; the redwood logging industry; the Pomo Indians and other Native American groups; Mexican and other Latin American immigrants: the Californios; the region's apple farming and processing history; the history and origin of Sebastopol's name; historic Chinatown; and local Japanese-American history.

Action COS 10j: Seek funding for the restoration and preservation of archaeological and historical resources.

4.14.2 Environmental Setting

Ethnographic Context

Prior to Euro-American settlement, the project vicinity was primarily inhabited by the Southern Pomo and the Coast Miwok.

Southern Pomo

The project site is located primarily within an area traditionally occupied by the Southern Pomo people. Pomo is a term used to describe a linguistically related group of tribes or communities of north coast central California (Kennedy 1955). The main Pomo area covers portions of four natural divisions: the coast, the redwood belt, the valley, and the lake regions (Barrett 1908). Specifically, Southern Pomo territory extends roughly from Gualala south to Duncan's Point, and east to the Russian River (Barrett 1908; McLendon and Oswalt 1978). This territory includes the mountainous terrain typical of the redwood belt of the Coast Range and a narrow coastal shelf (Kennedy 1955). The Pomo language has been assigned to the Hokan language family. Southern Pomo is one of several distinct Pomo dialect groups.

The Pomo were organized societies largely based on kinship. These societies consisted of independent tribelets ranging in size from 100 to 2,000 people, with the most significant social unit being the kin group (Bean and Theodoratus 1978). This also allowed them to travel for trade between villages and ceremonial networks (McLendon and Oswalt 1978). Pomo political organization is focused on a consensus of expectations and behaviors for the group unit that were passed down by the elders. The political organization depended on the community and did not value one more than another, as they were continually reminded by the group leader through their actions and behaviors (McLendon and Oswalt 1978).

Pomo houses consisted of slabs of redwood bark and wood placed against a center pole to form a conical structure with a smoke hole at the top of the cone. The houses were generally between 8-12 feet in diameter and 6-8 feet in height. These small house sizes limited house occupancy to the biological family group, contrasting with the extended family dwellings of the valley Pomo (Kennedy 1955). Other important structures include sweathouses and assembly or dance houses. The sweathouse, or men's house, was an earth covered conical structure. These were built over pits where the Pomo would pour water over hot rocks to make steam. This was used for purification and relaxation. The dance house was a semi-subterranean with a center pole, tunnel entrance, and rear door. During winter, the Southwestern Pomo lived in villages withdrawn from the ocean, but the necessities of obtaining food caused the population to move back and forth from the coast to the interior seasonally (Kennedy 1955).

Pomo subsistence was finely adapted to the environment around them for which they based their patterns on hunting, gathering, and fishing, with acorns, grains, pepperwood nuts, and buckeyes as a primary staple to be stored year-round (Bean and Theodoratus 1978; McLendon and Oswalt

1978). The pestle was manufactured and utilized by the Pomo to grind acorns and other foodstuffs. Although the streams and lakes were abundant with fish throughout the year, the Pomo focused their fishing efforts during spawning season when resources were in more shallow waters with larger quantities, often between February to April (McLendon and Oswalt 1978). Important plant resources included berries and seeds. Tule grass had many different uses including basketry for cooking, boats for fishing, and material for shelter, sleeping and sitting mats, clothing, and dance regalia (Lake County 2023).

Material culture included obsidian and chert tools, intricate basketry, and bone and shell implements (Bean and Theodoratus 1978). A unique aspect of Pomo basketry was the creation of small and sometimes feathered baskets. These baskets were coiled and made use of colorful feathers from woodpeckers, orioles, ducks, and other birds. Some of these baskets included polished abalone shell ornaments and topknots from California quail with a clamshell string attached to the rim with which such baskets might have been hung from the ceilings of Pomoan houses (Walker 2013). The Pomo also participated in a clamshell bead exchange system internally and among other tribal groups (Bean and Theodoratus 1978) as a form of currency, as evidenced by their use and each clamshell bead held a different monetary value (McLendon and Oswalt 1978).

The Pomo were invaded by Russian fur-traders who established a based in Fort Ross on Bodega Bay in 1812 (Santa Clara University 2023). This base was devastating to the Pomo people, who used that site as their main hunting and gathering grounds in the summer. The Pomo were also drawn into the mission system in the early 1800s, where native labor built the mission and other structures. Within a generation or two, direct conflict and exposure to European diseases nearly decimated them. Today about 5,000 Pomo descendants, who still occupy parts of their ancestral lands, gather the raw materials to make traditional Native American baskets and to pass on this ancient skill to the next generation of artisans (California Department of Parks and Recreation 2022).

Coast Miwok

The project site also lies just north of the traditional tribal territory of the Coast Miwok. Coast Miwok territory is centered on Marin and Sonoma Counties, extending roughly from Duncan's Point south to Point Bonita, with the inland boundary east of the Sonoma River (Kelly 1978:414; Kroeber 1925:443). The Miwok Language consists of two dialect groups: the southern, or Marin group, and the western, or Bodega group (Kelly 1978:414).

The pre-contact Coast Miwok inhabited villages made up of conical dwellings, semi-subterranean sweathouses, and dance houses (Kelly 1978:417). Each village had a chief to oversee village affairs and social and ceremonial life was organized around moieties, or dichotomous groups, classed as either Land or Water (Kelly 1978:419).

Coast Miwok subsistence was based on hunting, gathering, and fishing (Kelly 1978: 415-417). Dried acorns and kelp were primary food sources during the winter and early spring when food was scarce. Coast Miwok relied heavily on nearshore fish and shellfish and on fish from rivers, marshes, and the bay. Hunting focused on deer, elk, bear, and small game. The material culture of the Coast Miwok included clamshell disk beads as currency, and a variety of stone tools, shell ornaments, ceremonial artifacts, and baskets (Kelly 1978: 417-418).

The Coast Miwok were exploited for labor by Mission Dolores, established in 1800 in San Francisco, and later by the Mexican land grant holders. As a direct result of the establishment of the mission system, the Coast Miwok population dramatically declined. After the establishment of the United States, the Coast Miwok were legally prevented from owning land in their traditional territories.

Despite this, the Coast Miwok continued to populate the Marin area, often working as farm workers or in the fishing industry (Milliken et al. 2009; Federated Indians of Graton Rancheria 2016).

Federated Indians of Graton Rancheria

In 1920, the Graton Rancheria was formed when the Bureau of Indian Affairs purchased a 15.45-acre tract of land in the unincorporated community of Graton in Sonoma County, approximately four miles north of Sebastopol, which was put into a federal trust. The development of the Graton Rancheria effectively consolidated the Coast Miwok and Southern Pomo groups into one entity, establishing them as a federally recognized tribe (Federated Indians of Graton Rancheria 2016). However, in 1958 Congress passed the California Rancheria Act of 1958 which led to the termination of 41 California Rancherias, including the Graton Rancheria. Graton Rancheria was removed from federal trust and federal recognition of the tribe was terminated. Despite this setback, tribal members continued to protect their cultural identity, preserving important tribal and archaeological sites within their traditional and ancestral territory. Between 1990 and 1992 tribal members traveled to Washington, D.C., in effort to restore their federal status, until 2000, when President Clinton signed legislation restoring federal recognition to the tribe, which had been renamed the Federated Indians of Graton Rancheria. The tribe was able to purchase 254 acres of land in 2005 for its reservation located just outside Rohnert Park (ten miles south of Sebastopol) where they now operate the Graton Resort and Casino, and in doing so, the tribe is able to provide programs and services to Tribal Citizens (Federated Indians of Graton Rancheria 2016).

4.14.3 Impact Analysis

a. Significance Thresholds and Methodology

Significance Thresholds

The proposed project would have a potentially significant impact if it were to result in one or more of the following:

1. 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. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC Section 5020.1(k), or
   b. 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 PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Methodology

Sacred Lands File Search

The City contacted the Native American Heritage Commission (NAHC) on May 25, 2023, to request a search of the Sacred Lands File (SLF), as well as a contact list of Native Americans culturally affiliated with the project site vicinity.

Assembly Bill 52

As part of its Tribal Cultural Resource identification process pursuant to California Assembly Bill (AB) 52, the City sent letters via certified mail on January 27, 2023, to ten Native American tribal contacts identified by the Native American Heritage Commission (NAHC) and the City as being traditionally and culturally affiliated with the project vicinity. The tribal contacts included the following.

- Patricia Hermosillo, Chairperson of the Cloverdale Rancheria of Pomo Indians
- Sherrie Smith-Ferri, Tribal Historic Preservation Officer of the Dry Creek Rancheria of Pomo Indians
- Greg Sarris, Chairperson of the Federated Indians of Graton Rancheria
- Donald Duncan, Chairperson of the Guidiville Indian Rancheria
- Dino Franklin, Chairperson of the Kashia Band of Pomo Indians of the Stewarts Point Rancheria
- Loren Smith, Tribal Historic Preservation Officer of the Kashia Band of Pomo Indians of the Stewarts Point Rancheria
- Marjorie Mejia, Chairperson of the Lytton Rancheria
- Jose Simon, Chairperson of the Middletown Rancheria of Pomo Indians
- Leona Willams, Chairperson of the Pinoleville Pomo Nation
- Beniakem Cromwell, Chairperson of the Robinson Rancheria of Pomo Indians

Under AB 52, tribes have 30 days to respond and request consultation. The results of the tribal consultation were utilized for the analysis of impact related to tribal cultural resources below.

b. Project Impacts and Mitigation Measures

Threshold 1:	Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074 that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?
Threshold 2:	Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074 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?

Impact TCR-1 GRADING AND EXCAVATION REQUIRED FOR THE PROPOSED PROJECT WOULD HAVE POTENTIAL TO UNEARTH AND IMPACT OR DAMAGE TRIBAL CULTURAL RESOURCES. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH IMPLEMENTATION OF MITIGATION.

The NAHC responded to the request on June 20, 2023, stating that the results of the SLF search were positive for sacred sites within the project vicinity. Additionally, on June 27, 2023, the City sent AB 52 consultation letters via certified mail to ten Native American tribal contacts. The City received one response from the Kashia Band of Pomo Indians of Stewarts Point which stated that the tribe had no comments or concerns. To date, the City has not received any additional responses under AB 52. Though there are no known tribal cultural resources present within the project site, it is possible that ground disturbance during project construction could encounter previously unknown tribal cultural resources. Therefore, the project has the potential to significantly impact tribal cultural resources through ground disturbance and subsequent damage of encountered resources.

Action COS 10c of the 2016 Sebastopol General Plan requires all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources:

- If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Planning Department shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Planning Department.

Although Action COS 10c states that work must stop within 100 feet of an inadvertent discovery of cultural resources, it does not specifically address how the find will be evaluated and how it relates to tribal cultural resources. Therefore, additional mitigation is required. With adherence to Action COS 10c and Mitigation Measure TCR-1 below, the potential impacts to tribal cultural resources are reduced to a less than significant level.

Mitigation Measures

TCR-1 Suspension of Work Around Tribal Cultural Resources

If cultural resources of Native American origin are identified during implementation of the proposed project, all earth-disturbing work within 50 feet of the find shall cease and desist until an archaeologist has evaluated the nature and significance of the find as a cultural resource and an appropriate local Native American representative is consulted. Staking of the area of discovery will be implemented with stakes no more than 10 feet apart, forming a circle having a radius of no less than 100 feet from the point of discovery. If the City, in consultation with local Native American tribes, determines that the resource is a tribal cultural resource and thus significant under CEQA, a mitigation plan shall be prepared and implemented in accordance with state guidelines and in consultation with local Native American group(s). The plan shall include avoidance of the resource or, if avoidance of the resource is infeasible, the plan shall outline the appropriate treatment of the resource in coordination with the appropriate local Native American tribal representative and, if applicable, a qualified archaeologist. Examples of appropriate mitigation for tribal cultural resources include, but are not limited to, protecting the cultural character and integrity of the resource, protecting traditional use of the resource, protecting the confidentiality of the resource, or heritage recovery.

Significance After Mitigation

By implementing Mitigation Measure TCR-1, the City would evaluate and require steps to protect or treat significant tribal cultural resources if encountered during construction, resulting in a less than significant impact.

4.14.4 Cumulative Impacts

The geographic scope for cumulative tribal cultural resources includes the areas surrounding the project site, including incorporated Sebastopol lands and Sonoma County lands within approximately 10 miles of the city. This geographic scope is appropriate for tribal cultural resources because it encompasses the regional area that could contain important resources similar to the project site.

The planned and pending projects in the project vicinity are listed in Table 3-1 of Section 3, Environmental Setting. Cumulative development in the region would continue to disturb areas with the potential to contain tribal cultural resources. Impacts to these resources would most likely be mitigated on a project-by-project basis. However, permanent losses of tribal cultural resources would have a potentially significant cumulative impact.

As described under Impact TCR-1, the project has the potential to impact previously unidentified tribal cultural resources located in the project site. Mitigation Measure TCR-1 would ensure that project-level impacts to unknown tribal cultural resources are adequately mitigated. Therefore, the project's contribution to cumulative impacts to tribal cultural resources would not be cumulatively considerable.

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4.15 Utilities and Service Systems

This section analyzes the environmental effects related to utilities and service systems associated with implementation of the proposed project. It discusses infrastructure and facilities related to water supply, wastewater treatment, stormwater, electricity, natural gas, telecommunications, and solid waste.

4.15.1 Setting

a. Water

The City of Sebastopol has owned, operated, and maintained its own water production and distribution system since approximately 1915 (Sebastopol 2005). The City relies exclusively on groundwater as a water supply source. Water is produced via a series of five permitted wells located throughout the City, three of which are currently active for potable water uses, non-potable water uses, irrigation, and industrial uses (City of Sebastopol 2014). All of the City's available water is groundwater from these three active wells. The City also owns two reservoir facilities to provide water storage capacity.

The City serves approximately 2,650 water service customers and the predominant use over the last 10 years has been potable use (City of Sebastopol 2014). During calendar year 2012 single-family and multifamily residential customers accounted for 70 percent of water consumption, followed by 21 percent for commercial/industrial uses, 8 percent for landscape and irrigation, and 1 percent for other uses. Total production for 2012 equated to an average production of 1 million gallons per day (mgd). According to the City's General Plan EIR, the average total per capita water production between 2006 and 2015, as shown in Table 4.15-1, was 129 gallons per person per day, equaling approximately 29.2 percent of maximum production.

Table 4.15-1 City of Sebastopol Water Production

Production	10-Year Average
Total Annual Production (mg)[1]	361
Maximum Production (mg)	1,237
Average Production Per Capita Per Day (gallons)	129
Percent of Total Production to Max Production	29.18%

[1] mg = million gallons
Source: City of Sebastopol 2016a

The City adopted a Water System Master Plan (Master Plan) in September 2005 as an instrument for planning water system improvements necessary to comply with current City zoning ordinances, City Standard Details and Specifications, and federal fire regulations (City of Sebastopol 2005). The Master Plan analyzes the existing water system, makes recommendations for system improvements or necessary updates, and assesses water demand projects for the service area. The City Council has adopted a policy that the City be able to produce two times the water demand necessary to ensure that the City has sufficient redundancy in the event of a facility malfunction or shutdown for maintenance, upgrade or repair.

Existing City water infrastructure is located along Gravenstein Highway North, which serves the surrounding development and residences. The proposed project would connect to this existing infrastructure.

b. Wastewater

The City owns and operates its own wastewater collection and conveyance system and contracts with the City of Santa Rosa Subregional Water Reclamation System for wastewater treatment. All of the City's wastewater is conveyed via pipeline to the City of Santa Rosa Wastewater Treatment Facility's Laguna Treatment Plant on Llano Road. The City's wastewater collection system consists of approximately 152,000 linear feet of pipe, ranging from 6 inches to 22 inches in diameter, and two lift stations, the Morris Street Lift Station and the Green Valley Vista Lift Station (City of Sebastopol 2016a).

From the stations the wastewater is pumped to the Laguna Treatment Plant through a 14-inch diameter force main. As a partner in the Subregional System, Sebastopol has an entitlement for treatment capacity up to 840,000 gallons, or 0.84 million gpd Average Daily Dry Weather Flow (ADDWF) (City of Sebastopol 2016a). As of 2022, ADDWF was 0.393 mgd, or about 47 percent of the City's treatment entitlement (City of Sebastopol 2023a). According to the City of Santa Rosa's 2007 Update to the Recycled Water Master Plan, the City of Santa Rosa's current National Pollutant Discharge Elimination System (NPDES) permit allows the City to treat, reuse, and discharge the annual flow resulting from receiving a daily average dry weather flow (ADWF) of 21.34 million gallons per day (mgd) at the Laguna Plant (City of Santa Rosa 2007).

Existing wastewater facilities are located along Gravenstein Highway North which serve the surrounding development and residences. The proposed project would connect to these existing wastewater facilities.

c. Stormwater

The City of Sebastopol owns and operates a storm water conveyance system located primarily within public streets and roads, and on public lands within the City of Sebastopol. The storm drain system includes an underground network of pipes connecting surface inlets in streets and elsewhere, where storm water collects. The majority of the City's storm drain system flows in an easterly direction and discharges into the Laguna de Santa Rosa along the City's eastern boundary. A small area in the westerly portion of the City drains to Atascadero Creek at the Western City boundary.

The City adopted a Stormwater Management Plan (SWMP) in 2006 to comply with the Federal Storm Water Phase II Final Rule which requires operators of small municipal separate storm sewer systems (MS4s) to obtain a National Pollutant Discharge Elimination System (NPDES) permit and a SWMP (City of Sebastopol 2006). The Sebastopol Engineering Department is responsible for the development and implementation of the SWMP, including measurable goals and best management practices (BMPs).

There are currently no stormwater facilities available on the project site. Stormwater currently follows natural drainages within the site that generally flow from east to west. The project would install stormwater detention pond on the northern boundary of the site adjacent to the West County Trail. Bioretention facilities are proposed along the north, northeast, west, and southern project boundaries which would hold stormwater prior to discharge into existing drainages.

d. Solid Waste

The City of Sebastopol contracts with Recology for solid waste, recyclable and compostable materials collections as well as street sweeping services. The current contract was approved on December 5, 2008 and will end at midnight on December 31, 2024. The City is also a member of the Sonoma County Waste Management Agency (SCWMA), which is comprised of the nine incorporated cities in Sonoma County as well as the County of Sonoma. SCWMA is responsible for the development, operation and management of the county's recycling programs. An additional effort the City is participating in is the Sonoma County/City Solid Waste Advisory Group (SWAG). This effort is focused on developing long term strategies for addressing Sonoma County's waste management needs.

Recology deposits solid waste at the Central Disposal Site at 500 Mecham Road in Petaluma, approximately 9.3 miles southeast of the project site. The Central Disposal Site has a maximum permitted throughput of 2,500 tons per day and a maximum permitted capacity of 32,650,000 cubic yards (California Department of Resources Recycling and Recovery [CalRecycle] 2023). The landfill has a remaining capacity of 9,181,519 tons and an anticipated closure date of June 1, 2043 (CalRecycle 2023).

e. Electricity and Natural Gas

Homes and businesses in Sebastopol use electricity from various sources, including wind, solar, hydroelectric, nuclear, coal, and natural gas. The main electricity provider in the region is Pacific Gas and Electric Company (PG&E). In addition, the City joined Sonoma Clean Power (SCP), a regional public clean energy provider which utilizes renewable resources, such as geothermal, wind, and solar.

PG&E is responsible for providing electric power supply to the city. PG&E is one of the nation's largest electric and gas utility companies, and it maintains 106,681 circuit miles of electric distribution lines and 18,466 circuit miles of interconnected transmission lines (PG&E 2022). In 2019, PG&E's power mix, including all PG&E-owned generation plus the company's power purchases, consisted of 29 percent renewable resources (wind, geothermal, biomass, solar, and small hydroelectric), 44 percent nuclear generation, and 27 percent large hydroelectric facilities (PG&E 2020). PG&E also provides natural gas service to the project site and surrounding areas.

f. Telecommunications

In California, approximately 98 percent of households have access to telecommunication infrastructure, including telephone and cable access (California Cable & Telecommunications Association 2019). Telecommunications infrastructure within Sebastopol includes overground telephone wires, underground optical fibers, cell towers, and standard phone equipment and internet routers. Telecommunications providers own and operate infrastructure, such as cellphone towers and fiber optic cables, within the city. The site would be served by existing telecommunications providers within the area, including AT&T and Xfinity.

4.15.2 Regulatory Setting

a. Federal Regulations

Title 40 of the Code of Federal Regulations, Part 258

Title 40 of the CFR, Part 258 (Resource Conservation and Recovery Act, Subtitle D), contains regulations for municipal solid waste landfills and requires states to implement their own permitting programs incorporating the Federal landfill criteria.

b. State Regulations

California Plumbing Code

The California Plumbing Code is codified in Title 24 CCR Part 5. The Plumbing Code contains regulations including, but not limited to, plumbing materials, fixtures, water heaters, water supply and distribution, ventilation, and drainage. More specifically, Part 5, Chapter 4, contains provisions requiring the installation of low flow fixtures and toilets. Existing development will also be required to reduce its wastewater generation by retrofitting existing structures with water efficient fixtures (Senate Bill [SB] 407 [2009] Civil Code Sections 1101.1 et seq.).

California Green Building Standards Code

The California Green Building Standards Code—Part 11, Title 24, California Code of Regulations—known as CALGreen, is the first-in-the-nation mandatory green building standards code. In 2007, CBSC developed green building standards in an effort to meet the goals of California's landmark initiative AB 32, which established a comprehensive program of cost-effective reductions of greenhouse gases (GHG) to 1990 levels by 2020. CALGreen sets regulations regarding energy efficiency, water efficiency and conservation, material conservation, resource efficiency, and environmental quality. The code sets mandatory provisions for commercial, residential, and public school buildings.

Assembly Bill 341 and Senate Bill 1383

The purpose of Assembly Bill (AB) 341 of 2011 (Chapter 476, Statutes of 2011) is to reduce GHG emissions by diverting commercial solid waste to recycling efforts and to expand the opportunity for additional recycling services and recycling manufacturing facilities in California. In addition to Mandatory Commercial Recycling, AB 341 sets a statewide goal for 75 percent disposal reduction by the year 2020.

In addition, SB 1383 of 2016 (Chapter 395, Statutes of 2016) established the following goals: a 50-percent reduction in the level of the statewide disposal of organic waste from 2014 levels by 2020, and a 75-percent reduction in the level of the statewide disposal of organic waste from 2014 levels by 2025. This bill also authorized CalRecycle to adopt regulations, to take effect on or after January 1, 2022, to achieve these targets.

Assembly Bill 939

AB 939 (PRC 41780) requires cities and counties to prepare integrated waste management plans and to divert 50 percent of solid waste from landfills beginning in calendar year 2000 and each year thereafter. AB 939 also requires cities and counties to prepare source reduction and recycling elements as part of the integrated waste management plans. These elements are designed to develop recycling services to achieve diversion goals, stimulate local recycling in manufacturing, and stimulate the purchase of recycled products.

Assembly Bill 1826

AB 1826 of 2014 (Chapter 727, Statutes of 2014) requires businesses that generate a specified amount of organic waste per week to arrange for recycling services for that waste, and for jurisdictions to implement a recycling program to divert organic waste from businesses subject to the law, as well as report to CalRecycle on their progress in implementing an organic waste recycling program.

Senate Bill 1016

SB 1016 of 2007 (Chapter 343, Statutes of 2007) requires that the 50 percent solid waste diversion requirement established by AB 939 be expressed in pounds per person per day. SB 1016 changed the CalRecycle review process for each municipality's integrated waste management plan. After an initial determination of diversion requirements in 2006 and establishing diversion rates for subsequent calendar years, the Board reviews a jurisdiction's diversion rate compliance in accordance with a specified schedule. The Board is required to review a jurisdiction's source reduction and recycling element and hazardous waste element once every two years.

c. Local Regulations and Plans

City of Sebastopol Water System Master Plan

In 2005, the City approved the Sebastopol Water System Master Plan, which is intended to assist with planning water system improvements necessary to comply with current City zoning ordinances, City Standard Details and Specifications, and federal fire regulations. The plan describes the existing water system and estimates water demand projections. Additionally, it makes recommendations for water system improvements across the city.

City of Sebastopol Water Shortage Contingency Plan

In June 2023, the City approved the Sebastopol Water Supply Contingency Plan (WSCP) which seeks to conserve the available water supply and ensure the integrity of the water system. The plan outlines drought response stages, triggers, and response actions.

City of Sebastopol Storm Water Management Plan

In September 2005, the City approved the Sebastopol Stormwater Management which was developed to comply with the federal Storm Water Phase II Final Rule, which requires operators of small municipal separate storm sewer systems (MS4s) to obtain a National Pollutant Discharge Elimination System (NPDES) permit. The plan includes an overview of the watershed, storm sewer system, and pollutants of concern. It outlines minimum control measures and monitoring evaluations to ensure proper implementation of the plan.

Sonoma County Local Agency Formation Commission

In 1963, the State Legislature created a local agency formation commission (LAFCO) for each county, with the authority to regulate local agency boundary changes. Subsequently, the State has expanded the authority of a LAFCO. The goals of the LAFCO include preserving agricultural and open space land resources and providing for efficient delivery of services. The Sonoma County LAFCO has authority over land use decisions in Sonoma County affecting local agency boundaries and its authority extends to the incorporated cities. In addition, the Sonoma County LAFCO conducts Municipal Service Reviews (MSRs) for services within its jurisdiction. An MSR typically includes a review of existing municipal services provided by a local agency and its infrastructure needs and deficiencies. It also evaluates financing constraints and opportunities, management efficiencies, opportunities for rate restructuring and shared facilities, local accountability and governance, and other issues (City of Sebastopol 2016a).

City of Sebastopol General Plan

The City's 2016-2035 General Plan (City of Sebastopol 2016b) contains utility provision and resource policies intended to preserve the City's water, wastewater, and other utility resources. The following policies are relevant to the project.

Policy CSF 1-1: Ensure that new growth and development participates in the provision and expansion of community services and facilities, and does not exceed the City's ability to provide them.

Policy CSF 1-2: Require new development to demonstrate that the City's community services and facilities can accommodate the increased demand for said services and facilities associated with the project.

Policy CSF 1-3: Require new development to offset or mitigate impacts to community services and facilities to ensure that service levels for existing users are not degraded or impaired by new development, to the satisfaction of the City.

Policy CSF 1-4: Provide adequate public infrastructure (i.e., street, sewer, water, and storm drain) to meet the needs of existing and future development.

Policy CSF 1-5: Require development, infrastructure, and long-term planning projects to be consistent with all applicable City infrastructure plans, including the Water Master Plan, the Sanitary Sewer System Utility Master Plan, Stormwater Management Plan, and the Capital Improvement Program.

Policy CSF 1-6: When appropriate, require development projects to install off-site infrastructure or pay appropriate in-lieu fees.

Policy CSF 1-7: Require the payment of impact fees for all new development.

Policy CSF 1-8: Continue to require new utility infrastructure, including water lines, sewer lines, telecommunications infrastructure, and electrical utility lines to be constructed underground, except where allowed aboveground as set forth in the Municipal Code.

Policy CSF 1-9: Require new utility infrastructure to avoid sensitive natural and cultural resources to the greatest extent feasible.

Policy CSF 1-10: Require new utility infrastructure to be designed and constructed to meet the most current State standards for seismic safety.

Policy CSF 1-11: Require new underground electrical and data transmission infrastructure to include adequate conduit space to accommodate additional, expanded, and/or upgraded data and electrical conveyance lines and wires.

Policy CSF 3-1: Prior to the approval of major new development, Specific Plans, major infrastructure improvements, or other projects that would result in increased demand for public water conveyance and treatment, such projects must demonstrate proof of adequate water supply (e.g., that existing services are adequate to accommodate the increased demand, or improvements to the capacity of the system to meet increased demand will be made prior to project implementation) and that potential cumulative impacts to water users and the environment will be addressed

Policy CSF 4-1: Maintain adequate sewage conveyance infrastructure to meet existing and projected demand throughout the buildout of the General Plan.

Policy CSF 4-2: Ensure sewage system capacity is adequate to match the rate of development.

Policy CSF 4-6: Prior to the approval of development that would result in substantial increased demand for municipal sewage conveyance and treatment, require projects to demonstrate that existing services are adequate to accommodate the increased demand or that improvements to the capacity of the system to meet increased demand will be made prior to project implementation.

Policy CSF 4-7: Review new development for consistency with the Sewer Collection System Master Plan and require new development to pay fair-share payments towards implementation of system improvements identified in the Sewer Collection System Master Plan.

Sebastopol Municipal Code

Title 13 of the Sebastopol Municipal Code (SMC) provides requirements for public services including domestic water systems, sewage disposal, and underground utility facilities. This chapter identifies the required City permits for the construction and operation of water and wastewater connections. In addition, SMC Chapter 13.16 specifically addresses solid waste collection and disposal, and Chapter 13.20 incorporates the City’s stormwater ordinance.

4.15.3 Impact Analysis

a. Significance Thresholds and Methodology

Assessment of impacts is based on review of site information and conditions, City information regarding utility-related issues, including water supply and facilities, wastewater facilities, electricity, natural gas, telecommunication facilities, and solid waste.

According to Appendix G of the *CEQA Guidelines*, an impact is considered significant if development under the proposed project would result in one or more of the following conditions:

1. Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects.
2. Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years.

3. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand, in addition to the provider's existing commitments.
4. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.
5. Conflict with Federal, State, and local management and reduction statutes and regulations related to solid waste.

b. Project Impacts and Mitigation Measures

Threshold 1:	Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?
Threshold 3:	Would the project result in a determination by the wastewater treatment provider which 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?

Impact UTIL-1 THE PROPOSED PROJECT WOULD NOT REQUIRE THE RELOCATION OR CONSTRUCTION OF NEW OR EXPANDED WATER, WASTEWATER TREATMENT OR STORM WATER DRAINAGE, ELECTRIC POWER, NATURAL GAS, OR TELECOMMUNICATIONS FACILITIES. THE PROPOSED PROJECT WOULD BE ADEQUATELY SERVED BY EXISTING FACILITIES TO MEET THE PROJECT'S PROJECTED DEMANDS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Water

The proposed project would connect to existing service lines for water service. The project would be served by existing City water infrastructure in the area, and no improvements to the existing off-site infrastructure would be required to serve the project. The construction of on-site infrastructure, including water lines, is analyzed throughout this EIR, as described in Section 2, *Project Description.* Any future infrastructure improvements constructed by the City would be subject to its own CEQA review, and such improvements would not be necessitated by the proposed project. Impacts of the proposed project would be less than significant.

Wastewater

Sebastopol maintains a sanitary sewer collection system and pumping stations that transfer wastewater from Sebastopol to the Sub-regional Water Reclamation System Treatment Plant operated by the City of Santa Rosa on Llano Road. The project would connect to existing wastewater infrastructure along Gravenstein Highway North and would not require the expansion or construction of new wastewater facilities. Furthermore, the project applicant would be required to conduct a flow analysis prior to project approval to confirm flow capacities will not be exceeded by the additional project wastewater flows. Sebastopol has an entitlement to treatment capacity up to 840,000 gallons, or 0.84 million gallons per day (mgd) Average Daily Dry Weather Flow (ADDWF) (Sebastopol 2016a). ADDWF is computed using metered wastewater flows through the Morris Street Lift Station during the dry-weather months of each year (typically between May and September) with the lowest rainfall (City of Sebastopol 2016a).

The amount of wastewater generated by the project was estimated based on the estimated water demand calculated in Impact UTIL-2 and the principle that water demand is 120 percent of wastewater generation (due to evaporation and system losses, meaning that not all water that is used ends up going to the wastewater treatment plan). The project would generate approximately 18,100 gallons per day of wastewater.[1] This would account for approximately 2 percent of Sebastopol's total ADDWF entitlement capacity of 0.393 mgd (Sebastopol 2023a). No additional expansion of wastewater services would be required, the construction or relocation of which could cause significant environmental effects. Thus, impacts would be less than significant.

Stormwater

As described within Section 3.8, *Hydrology and Water Quality*, the proposed project would increase the amount of impervious surfaces on the project site, which could in turn increase stormwater runoff that enters Sebastopol's storm drain system. The proposed project includes onsite drainage improvements with bioretention facilities (vegetated buffers and bioswale) and a storm drain network. The inlet and overflow structures of an existing detention pond for the adjacent office park would be modified to detain and control combined drainage from the office park and proposed project. The project would comply with relevant water quality standards and waste discharge requirements, including SMC Chapter 13.20, Stormwater Ordinance which includes the NPDES Construction General Permit, and SMC Chapter 15.78 which includes the RWQCB stormwater Low Impact Development Technical Design Manual (LID Manual) for the City and Sonoma County. The proposed project would meet these requirements through the design of the onsite stormwater drainage improvements. Compliance with applicable federal, State, and local policies would ensure that stormwater is adequately managed on site and no off-site stormwater facilities are required. No stormwater facilities beyond those identified in Section 2, *Project Description*, would be required, and proposed stormwater facilities are analyzed throughout this EIR. This impact would be less than significant.

Electricity and Natural Gas

PG&E would provide electricity to the proposed project. No natural gas is proposed as part of the project. Existing power lines are available along Gravenstein Highway North that may be utilized to provide electricity to the project site. Additionally, homeowners would have the option to opt into the Sonoma Clean Power (SCP) program, which provides residents and businesses in Sonoma and Mendocino counties with clean energy from more renewable resources, such as geothermal, wind, and solar. While the project would need to connect to existing service lines, no additional expansion of electricity or gas services would be required. Thus, impacts would be less than significant.

Telecommunication

AT&T and/or Xfinity would provide telecommunication service to the project. Infrastructure capable of supporting telecommunications is currently present in the project site area. Thus, impacts would be less than significant.

As described above, the project would not require construction of new or expanded water, wastewater treatment, or stormwater drainage facilities, the construction or relocation of which could cause significant environmental effects. Electric power, natural gas, and telecommunications

[1] Water demand is approximately 8 million gallons per year. If water demand is 120 percent on wastewater demand, 8 million gallons per year divided by 1.2 (120 percent) would equal approximately 6.6 million gallons of wastewater per year. 3.9 million gallons of wastewater per year divided by 365 days would be approximately 18,100 gallons of wastewater per day.

facilities would be adequate in serving development facilitated by the proposed project. Therefore, impacts would be less than significant.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 2:	Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Impact UTIL-2 THERE ARE SUFFICIENT WATER SUPPLIES AVAILABLE TO SERVE THE PROPOSED PROJECT DURING NORMAL, DRY, AND MULTI-DRY YEAR CONDITIONS. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

The City of Sebastopol would provide water to the project site. There is no Urban Water Management Plan (UWMP) for the service area. The project site, located in Sebastopol, is not within the service territory of a water supply provider with 3,000 or more services connections such that a UWMP would be required.

The project would increase water demand at the project site. Construction and operation of the proposed project would require the use of potable and non-potable water. As discussed in Section 4.11, *Population and Housing*, the full buildout of the project could result in approximately 96 new residences and 204 new residents within Sebastopol. The proposed project would need to connect to existing service lines for water service. This increase in population would result in a corresponding increase in the demand for additional water supplies.

As discussed above in *Setting*, the average total per capita water production between 2006 and 2015 was 129 gallons per person per day. Utilizing the water usage rate of 129 gallons per capita per day, the total annual water demand of the proposed project would be approximately 9.6 mg[2], or 0.77 percent of the 1,237 mg maximum production for the city. The projected water supply currently available for production by the City of Sebastopol exceeds the projected water demand associated with the proposed project. While the project would increase water demand within the city, the projected water demand associated with the proposed project would not exceed the City's available water production capabilities.

Furthermore, the City adopted a Water Supply Contingency Plan in June 2023, which seeks to conserve the available water supply and protect the integrity of public water system supply facilities, with particular regard for domestic water use, sanitation, and fire protection, to protect and preserve public health, welfare, and safety and minimize the adverse impacts of water supply shortage or other water supply emergency conditions (City of Sebastopol 2023b).

The proposed project also includes water-conserving features. As described in Section 2, *Project Description,* future residences would include water-efficient appliances and water-efficient landscaping. In addition, CalGreen has a set of mandatory residential measures that require the use of water conserving plumbing fixtures, sets standards of compliance for outdoor potable water use, and establishes requirements for recycled water supply systems to increase water efficiency.

[2] 9.6 mg = 204 residents * 129 mg * 365

Although the project would increase water demand, service demand would be within the available capacities of the City of Sebastopol. Compliance with existing regulations and inclusion of the proposed water-conserving project features would also help ensure that an adequate supply of water is provided to the proposed project during normal, dry, and multi-dry year conditions. Therefore, impacts would be less than significant.

Mitigation Measures

No mitigation is required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

Threshold 4:	Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?
Threshold 5:	Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Impact UTIL-3 THE PROPOSED PROJECT WOULD NOT GENERATE SOLID WASTE IN EXCESS OF STATE OR LOCAL STANDARDS, OR IN EXCESS OF THE CAPACITY OF LOCAL INFRASTRUCTURE, WOULD NOT IMPAIR THE ATTAINMENT OF SOLID WASTE REDUCTION GOALS, AND WOULD COMPLY WITH FEDERAL, STATE, AND LOCAL STATUTES AND REGULATIONS RELATED TO SOLID WASTE. IMPACTS WOULD BE LESS THAN SIGNIFICANT.

Implementation of the proposed project would result in the addition of up to 80 single-family residential units and up to 16 ADUs, totaling 96 residential units. The Central Disposal Site has a maximum capacity of 32,650,000 cubic yards and has a remaining capacity of 9,181,519 cubic yards (CalRecycle 2023a). Based on a solid waste generation rate of 12.23 pounds per dwelling unit per day, the proposed project would generate an estimated 1,175 pounds per day[3] or about 428,540 pounds per year (or 214 tons per year) (CalRecycle 2023b). According to CalRecycle, the Central Disposal Site has a maximum daily throughput of approximately 2,500 tons per day and anticipated closure date of June 1, 2043 (CalRecycle 2023a). The proposed project would yield an annual solid waste generation of approximately 1,175 pounds per day, which would account for less than one percent of the daily throughput of the Central Disposal Site. The projected 1,175 pounds per day would equated to approximately 0.70 cubic yards per day[4] of solid waste or 255 cubic yards per year[5], which would account for less than one percent of the Central Disposal Site's remaining capacity. Therefore, the proposed project would not generate solid waste in excess of the capacity of local solid waste infrastructure.

Furthermore, AB 939 requires the diversion of 50 percent of solid waste from landfills. SB 1383 also requires a 75 percent reduction in statewide disposal of organic waste from 2014 levels by 2025, which would further reduce the amount of solid waste disposed at Central Disposal Site. In addition, the project would comply with federal, State, and local management and reduction statutes and regulations related to solid waste. Therefore, impacts from the generation of solid waste and compliance with solid waste management and reduction regulations are less than significant.

[3] 1,175 pounds per day = 96 residential units * 12.23 pounds per dwelling unit per day
[4] 0.70 cubic yards per day = 1,175 pounds per day * 0.000593299 cubic yards
[5] 255 cubic yards per year = 0.70 cubic yards per day * 365 days per year

Mitigation Measures

No mitigation is required.

Significance After Mitigation

Impacts would be less than significant without mitigation.

4.15.4 Cumulative Impacts

The geographic scope for cumulative analysis of utilities includes each of the respective utility district boundaries. This geographic scope is appropriate because public utilities involve widespread distribution of centralized resource supplies, such as electricity and potable water.

Cumulative projects would increase demand for water, wastewater, stormwater, electricity, natural gas, and telecommunication services, and may require facilities improvements as a result. Therefore, this cumulative impact is potentially significant. However, similar to the proposed project, cumulative projects would incorporate required project-specific design features and BMPs, would comply with all applicable regulations related to utilities, and would incorporate project-specific Stormwater Pollution Prevention Plans and BMP requirements. Therefore, cumulative impacts may be reduced to a less than significant level with these requirements.

As discussed under Impacts UTIL-1 and UTIL-2, the proposed project would have access to adequate water, wastewater, stormwater, electricity and natural gas facilities to meet project demands, and expansion of such facilities would not be required.

Similar to the proposed project, cumulative projects would rely on the City for their water supply. Water is expected to be available for normal, dry, and multi-dry year conditions. Therefore, this cumulative impact is less than significant.

The project would result in a less than significant impact on wastewater infrastructure with compliance with the existing regulations and the proposed water-conserving features. Cumulative projects would be conducted in compliance with applicable laws and regulations. If cumulative projects would be reliant on an available wastewater treatment plant, those projects would be analyzed for their impacts to that system. Therefore, this cumulative impact is potentially significant. However, the proposed project would result in approximately 2 percent of the City’s total ADDWF entitlement capacity and would not significantly contribute to cumulative impacts. Therefore, the potential for cumulative impacts would be less than significant, and the project’s contribution would not be cumulatively considerable.

The Central Disposal Site has a maximum capacity of 32,650,000 cubic yards and has a remaining capacity of 9,181,519 cubic yards (CalRecycle 2023a). Cumulative projects would be conducted in compliance with applicable laws and regulations. Due to the significant amount of remaining capacity of the Central Disposal Site, cumulative impacts associated with solid waste disposal would be less than significant. As described under Impact UTIL-3, the project would comply with applicable solid waste regulations, and would not result in an exceedance of the landfill’s remaining capacity. Therefore, the project’s contribution to this cumulative impact would not be cumulatively considerable.

4.16 Impacts Found to be Less Than Significant

4.16.1 Agriculture and Forestry

a. Checklist Questions

In accordance with Appendix G of the *CEQA Guidelines*, the proposed project would result in a significant impact if it would:

1. Convert Prime Farmland, Unique Farmland, Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;
2. Conflict with existing zoning for agricultural use, or a Williamson Act contract;
3. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g));
4. Result in the loss of forest land or conversion of forest land to non-forest use; or
5. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.

b. Answers to Checklist Questions and Conclusions

1-5) The project site is designated as Office/Light Industrial (OLI) in the 2016 City of Sebastopol General Plan. The project site is in an area classified as “New Urban or Built Up” land (California Department of Conservation, 2016a). The City’s General Plan land use map and zoning maps do not identify any agriculture or forestry resources in the City of Sebastopol. The Farmland Mapping and Monitoring Program of the California Resources Agency does not identify the project site as Prime Farmland, Unique Farmland, or Farmland or Statewide Importance and there are no lands within or adjacent to the city that are forest land as defined by Public Resources Code Section 12220(g), or timber land as defined by Public Resources Code Section 4526 (California Department of Conservation, 2018).

The project site is not located on or adjacent to agricultural land or forest land, and so the project would not result in the conversion of farmland to non-agricultural uses. For the same reasons, the project would have no impact with respect to non-agricultural use; conflict with agricultural zoning or the Williamson Act contract; result in the loss of forest land or conversion of forest land to non-forest use; or conversion of farmland to non-agricultural use. No impact would occur.

4.16.2 Energy

a. Checklist Questions

In accordance with Appendix G of the *CEQA Guidelines*, the proposed project would result in a significant impact if it would:

1. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.
2. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

1-2) The project would construct 80 solar all-electric, three-story townhome-style condominiums, with the potential for up to 16 Americans with Disability Act (ADA) accessible accessory dwelling units (ADUs). Electricity to the project site would be provided by Pacific Gas and Electric (PG&E),and the project would utilize renewable electricity through the use of solar panels. Additionally, homeowners would have the option to opt into the Sonoma Clean Power (SCP) program, which provides residents and businesses in Sonoma and Mendocino counties with clean energy from more renewable resources, such as geothermal, wind, and solar. All garages will be wired for EV charging and solar battery backup, and the project would include energy star appliances and Nest thermostats. No natural gas is proposed as part of the project.

The project would result in increased energy consumption when compared to existing conditions, through electricity to power facilities, and petroleum use by motor vehicles traveling to and from the project site. However, new development would comply with Title 24 Building Energy Efficiency Standards, CALGreen standards, California Code of Regulation provisions, and the USEPA Construction Equipment Fuel Efficiency Standard which would minimize the project's potential to result in the wasteful, inefficient, or unnecessary consumption of vehicle fuels. Furthermore, the project would include a new, enhanced 6-foot-wide pedestrian pathway with public access to connect the West County Trail to Gravenstein Highway, 96 bicycle parking spaces, and a bicycle repair station to facilitate pedestrian and bicycle transportation and reduce the use of gasoline vehicles.

With implementation of applicable energy efficiency measures, the project would minimally increase energy demand and petroleum demand due to the development of the project, compared with existing conditions. Therefore, project operation would not result in potentially significant environmental effects due to the wasteful, inefficient, or unnecessary consumption of energy, and impacts would be less than significant.

Senate Bill (SB) 100 mandates 100 percent clean electricity for California by 2045. Considering the project would be powered by the existing electricity grid and supplemented from its own solar power system, the project would eventually be powered completely by renewable energy as mandated by SB 100 and would not conflict with this statewide plan. Therefore, no conflict with an applicable plan, policy or regulation adopted for the purpose of renewable energy or energy efficiency is anticipated. There would be no impact.

4.16.3 Mineral Resources

a. Checklist Questions

In accordance with Appendix G of the *CEQA Guidelines*, the proposed project would result in a significant impact if it would:

1. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or
2. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

b. Answers to Checklist Questions and Conclusions

1-2) The project is in a suburban area in Sebastopol. The project site and surrounding properties are part of a suburban area with no current oil or gas extraction. There are no known mineral deposits of local or regional significance identified in or near the project site (California Geologic Survey, 2013). There are also no mining operations in or near the project site (California Department of Conservation 2016b).

The site is not designated as a significant mineral resources zone, and the project would not alter or displace mineral resources or mining activities. No impacts would occur.

4.16.4 Recreation

a. Checklist Questions

In accordance with Appendix G of the *CEQA Guidelines*, the proposed project would result in a significant impact if it would:

1. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
2. Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

b. Answers to Checklist Questions and Conclusions

1-2) As discussed in Section 4.12, *Public Services*, the City of Sebastopol owns and operates several parks and open space areas, comprised of 36.3 acres of developed parkland and approximately 240 acres of undeveloped open space (City of Sebastopol 2016). As mentioned under Section 4.11, *Population and Housing*, the proposed project would generate an estimated 204 new residents, which would represent less than three percent of the total citywide population.

The City of Sebastopol Municipal Code 17.280.020 requires all new residential development projects and subdivisions to dedicate land, pay a fee in lieu thereof, or both, at the option of the City, except as set forth in Government Code Section 66477(c)(7) and (8), for neighborhood or community parks or recreational purposes. The proposed project includes 107,200 square feet (2.46 acres) of common open space and construction of landscaped internal walkways throughout the site, including a new pedestrian pathway to connect the West County Trail to Gravenstein Highway along the south border of the site.

The incremental increase in new residents derived from the project would not substantially alter citywide demand for parks such that substantial physical deterioration of parks would occur, or the construction of new recreational facilities would be required. Payment of the in-lieu of fees or dedication of parkland or open space to maintain the minimum park to resident ratio would sufficiently mitigate any growth and impacts to parks induced by the proposed project. New or physically altered parks would not be required for the project and impacts would be less than significant.

The West County Trail parallels Gravenstein Highway, going from Sebastopol to Forestville. The proposed project would provide direct public access to the enhanced pedestrian pathway connecting the West County Trail to Gravenstein Highway along the south border of the site. Trail users may not be able to access the trail from the project site while construction is ongoing. However, they could access the trail from other access points and this impact would be temporary. Other amenities include on-site areas that would serve future residents of the project, such as bicycle parking spaces, gardens, active and passive seating areas, children's play areas, and a meditation hammock garden. The environmental impacts regarding construction of these amenities are analyzed throughout Section 4 of this report.

The parks closest to the project site are Ragal Ranch Park, located approximately .6 miles southwest of the project site, and Brookhaven Super Park, located approximately 0.7 miles south of the project site. Construction of the project would not involve off-site activities or construction that would directly affect these parks. Impacts would be less than significant.

4.16.5 Wildfire

a. Checklist Questions

In accordance with Appendix G of the *CEQA Guidelines*, the proposed project would result in a significant impact if it would:

1. Be located in or near state responsibility areas or lands classified as very high fire hazard severity zones and substantially impair an adopted emergency response plan or emergency evacuation plan;
2. Be located in or near state responsibility areas or lands classified as very high fire hazard severity zones and due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;
3. Be located in or near state responsibility areas or lands classified as very high fire hazard severity zones and require the installation or maintenance of associated infrastructure (such as 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 to the environment; or
4. Be located in or near state responsibility areas or lands classified as very high fire hazard severity zones and expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

b. Answers to Checklist Questions and Conclusions

1-4) The project site is not located within or near a Very High Fire Hazard Severity Zone or state responsibility area. The nearest Very High Fire Hazard Severity Zone is located approximately 3.25 miles west of the project site (CalFire 2007). As the project site is not located in or near a Very High Fire Hazard Severity Zone, no impact would occur.

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5 Other CEQA Required Discussions

This section discusses growth-inducing impacts, irreversible environmental impacts, and energy impacts that would be caused by the proposed project.

5.1 Growth Inducement

CEQA Guidelines Section 15126(d) requires a discussion of a proposed project's potential to foster economic or population growth, including ways in which a project could remove an obstacle to growth. Growth does not necessarily create significant physical changes to the environment. However, depending upon the type, magnitude, and location of growth, it can result in significant adverse environmental effects. The proposed project's growth inducing potential is therefore considered significant if project-induced growth could result in significant physical effects in one or more environmental issue areas.

5.1.1 Population Growth

As discussed in Section 4.11, *Population and Housing*, the proposed project would add 80 residential units with the potential for up to 16 ADUs conservatively resulting in 96 new residential units and therefore would directly generate population growth. Based on a per-person household rate of 2.12 for the City of Sebastopol (DOF 2023), these 96 units would add an estimated 204 new residents to the City population. The city's 2022 population is estimated at 7,433 (DOF 2023). The addition of 204 new residents from the proposed project to the city would therefore increase the population of Sebastopol to approximately 7,637 residents. As described in Section 4.9, *Population and Housing*, the City of Sebastopol is expected to plan for a total of 213 new units through the 2023-2031 RHNA planning period (City of Sebastopol 2023).

Through the Housing Element, the City has identified meeting this goal through primarily projected ADU development and pending, approved, or permitted projects. As shown on Table 16 of the Housing Element, the proposed project is considered within the City's pending project list which would count for RHNA credit (City of Sebastopol 2023), with the market rate units providing 68 of the City's required 92 Above Moderate Income (AMI) units, and 12 of the required 35 Moderate Income (MI) units.

The Housing Element underwent separate CEQA review and was ultimately approved by the City of Sebastopol in January 2023. Furthermore, given that the State is currently in an ongoing housing crisis due to an insufficient housing supply, the additional residential units under the project would further assist in addressing the existing crisis and meeting the housing needs of the City's communities.

In addition, the City has a Growth Management Ordinance which allocates 50 dwelling units per year (plus exempt units), with carryover provisions. Once a residential project has obtained final discretionary approval, then needed allocations can be issued on a first come, first served basis by the Planning Director for the remaining allocations available that year in accordance with SMC 17.500.030(B). These dwelling allocations are valid until the discretionary approval expires. There are currently 149 unit allocations available (as of January 1, 2023) for non-exempt units, of which the proposed project would need 68 units. Given the current development pipeline of anticipated projects, and timeline for the proposed project, it is anticipated that adequate allocations would be available for the project.

Therefore, because the project is designed for planned and orderly growth, as mandated by the State, development in accordance with the project would not indirectly induce growth in the City. Overall, population growth associated with the project would not result in significant long-term physical environmental effects, other than those already disclosed in this EIR.

5.1.2 Economic Growth

The proposed project would generate temporary employment opportunities during construction. Because construction workers would be expected to be drawn from the existing regional work force, construction of the project would not be growth-inducing from a temporary employment standpoint. The proposed project would not involve new commercial uses that would add long-term employment opportunities. Overall, the proposed project would not induce substantial economic expansion to the extent that direct physical environmental effects would result.

5.1.3 Removal of Obstacles to Growth

The project site is surrounded by residential and commercial uses and agricultural areas that are served by existing infrastructure. As discussed in Section 4.13, *Transportation,* and Section 4.15, *Utilities and Service Systems,* of this EIR, existing infrastructure in Sebastopol would be adequate to serve the project. Minor improvements to water, sewer, and drainage connection infrastructure could be needed, but would be sized to specifically serve the project. No new roads would be required. Project implementation would not remove an obstacle to growth.

5.2 Irreversible Environmental Effects

The *CEQA Guidelines* require that EIRs contain a discussion of significant irreversible environmental changes. This section addresses non-renewable resources, the commitment of future generations to the proposed uses, and irreversible impacts associated with the proposed project.

The proposed project involves residential development in the City of Sebastopol. Construction and operation of the project would involve an irreversible commitment of construction materials and non-renewable energy resources. Construction would involve the use of building materials and energy, some of which are non-renewable resources. Consumption of these resources would occur with any development in the region and are not unique to the proposed project.

The proposed project would also irreversibly increase local demand for non-renewable energy resources such as petroleum products and natural gas. However, development would be subject to the energy conservation requirements of the California Energy Code (Title 24, Part 6, of the California Code of Regulations, *California's Energy Efficiency Standards for Residential and Nonresidential Buildings*) and the California Green Building Standards Code (Title 24, Part 11 of the California Code of Regulations). The California Energy Code provides energy conservation standards for all new and renovated commercial and residential buildings constructed in California, and the Green Building Standards Code requires solar access, natural ventilation, and stormwater capture. Consequently, development would not use unusual amounts of energy or construction materials and impacts related to consumption of non-renewable resources would be less than significant. Again, consumption of these resources would occur with any development in the region and is not unique to the proposed project.

Additional vehicle trips associated with the proposed project would incrementally increase local traffic and regional air pollutant and GHG emissions. As discussed in Section 4.2, *Air Quality*, and Section 4.6, *Greenhouse Gas Emissions,* with implementation of mitigation measures, development and operation of the proposed project would not generate air quality or GHG emissions that would result in a significant impact. Additionally, Section 4.13, *Transportation*, concludes that long-term impacts associated with the proposed project would be less than significant with mitigation based on City and regional thresholds.

The project would also require a commitment of law enforcement, fire protection, water supply, wastewater treatment, and solid waste disposal services. However, as discussed in Section 4.12, *Public Services*, and Section 4.15, *Utilities and Service Systems,* impacts to these service systems would not be significant.

CEQA requires decision makers to balance the benefits of a proposed project against its unavoidable environmental risks in determining whether to approve a project. The analysis contained in this EIR concludes that the proposed project would not result in impacts that are significant and unavoidable.

5.3 Energy Effects

Public Resources Code Section 21100(b)(2) and Appendix F of the *CEQA Guidelines* requires an EIR to discuss the potential for a project to result in impacts related to energy consumption and/or conservation. A project may have the potential to cause such impacts if it would result in inefficient, wasteful, or unnecessary consumption of energy, including electricity, natural gas, or transportation fuel supplies and/or resources. Impacts associated with energy use are discussed in Section 4.16, *Effects Found to be Less than Significant,* of this EIR and were found to be less than significant.

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6 Alternatives

As required by Section 15126.6 of the CEQA Guidelines, this EIR examines a range of reasonable alternatives to the proposed project that would attain most of the basic project objectives (stated in Section 2 of this EIR) but would avoid or substantially lessen the significant adverse impacts.

As discussed in Section 2, *Project Description*, the objectives for the proposed project, are as follows:

- Develop diverse residential uses, including ADUs, that add diversity to the City of Sebastopol's ownership housing supply and meet a variety of residents' needs by encouraging inherent affordability and providing housing opportunities for households at a variety of income levels and life stages.
- Develop a well-designed ownership residential townhome project that includes accessible and adaptable features in every building to provide ADA accessibility beyond what is required by the building code.
- Construct a single, cohesive development consisting of high-quality, contemporary urban design that respects and relates well to its surroundings and respects the urban forest that will remain.
- Bolster the connection between the community and the West County Trail through the preservation of existing pathways and ensuring continued use of the trail.
- Achieve the streamlined and efficient processing and approval of the project including benefits available to developments that include affordable housing consistent with the State Density Bonus Law.

Included in this analysis are three alternatives, including the CEQA-required "no project" alternative, that involve changes to the project that may reduce the project-related environmental impacts as identified in this EIR. Alternatives have been developed to provide a reasonable range of options to consider that would help decision makers and the public understand the general implications of revising or eliminating certain components of the proposed project.

The following alternatives are evaluated in this EIR:

- Alternative 1: No Project
- Alternative 2: Reduced Development Density
- Alternative 3: Increased Development Density

Table 6-1 provides a summary comparison of the development characteristics of the proposed project and each of the alternatives considered. Detailed descriptions of the alternatives are included in the impact analysis for each alternative. The potential environmental impacts of each alternative are analyzed in Sections 6.1 through 6.3.

Table 6-1 Comparison of Project Alternatives' Buildout Characteristics

Feature	Proposed Project	Alternative 1: No Project	Alternative 2: Reduced Development Density	Alternative 3: Increased Development Density
Dwelling Units	80 units, with a maximum of 16 ADUs	0 units	73 units, with a maximum of 14 ADUs	103 units
Density[1]	13.1 dwelling units/acre	0 dwelling units/acre	11.5 dwelling units/acre	16.9 dwelling units/acre
Maximum Building Height	3 stories with Density Bonus Waiver	0 stories	3 stories with Density Bonus Waiver	3 stories with Density Bonus Waiver
Parking Spaces	218 spaces	0 spaces	200 spaces	186 spaces

6.1 Alternative 1: No Project Alternative

6.1.1 Description

The No Project Alternative assumes that the proposed residential development and subsequent construction of internal roadways, parking, and associated site improvements would not occur, and that the current, undeveloped use of the site would remain. Because no construction or development would occur under the Alternative 1, the 22 trees proposed to be removed for the project would not be removed and the existing 133 trees on site would remain. The No Project Alternative would not meet project objectives related to increasing housing inventory to address statewide and local housing needs or provide housing opportunities for a variety of income levels and life stages within the city of Sebastopol, as residential development would not occur under this alternative.

6.1.2 Impact Analysis

Under Alternative 1, existing use of the project site would continue and residential development and subsequent construction of internal roadways, parking, and associated site improvements would not occur. Because this alternative would not involve construction of new residences, roadways, utility connections, or other site disturbance, Alternative 1 would not result in construction-related impacts to air quality, biological resources, cultural and tribal cultural resources, geology and soils, greenhouse gas (GHG) emissions, or noise. In terms of operation, Alternative 1 would involve continued use as undeveloped land and would not result in the future operation of 96 total residences, which would require additional utility connections. Therefore, Alternative 1 would not result in impacts to energy, hydrology and water quality, or utilities, as the project site would not require new electricity, water, and sewer connections or infrastructure under this alternative. Furthermore, because Alternative 1 would not result in new residential uses on the project site, there would be no impacts to aesthetics and land use and planning. Finally, vehicle traffic to and from the project site would remain the same as existing conditions, and Alternative 1 would not result in impacts to transportation.

Altogether, no new environmental impacts would occur under Alternative 1, this alternative would not meet project objectives identified within the EIR nor meet goals related to increasing housing inventory.

6.2 Alternative 2: Reduced Development Density

6.2.1 Description

Alternative 2 would involve a reduced total buildout of 73 residential units, with the potential for up to 14 accessory dwelling units (ADUs), resulting in 87 potential housing units. Alternative 2 would result in a reduction of 9 residential units compared to the proposed project. Because this alternative would involve fewer residences, less grading and excavation would be required as fewer units, roads, and utility connections would be constructed, and fewer trees would be removed. Furthermore, more of the project site would be available for open space and more trees would remain on site compared to the proposed project, as the proposed project would encourage buildout over a larger area than Alternative 2. New utility infrastructure would still be required on the project site under this alternative, including stormwater retention basins, internal roadways and parking, and water pipelines between existing water line infrastructure and proposed townhomes. On-site soil contaminants could remain undisturbed under this alternative, depending on the design.

Alternative 2 would not meet goals related to increasing housing inventory as effectively as the proposed project as development would be reduced compared to the proposed project, and may not be financially feasible due to development costs.

6.2.2 Impact Analysis

a. Aesthetics

There are no scenic routes within the vicinity of the project site, the project site is not visible from state scenic highways, and future residences would be shielded from view by the existing topography of the project site. Construction of future residences under Alternative 2 would not be visible from scenic routes identified by the City or state scenic highways. While Alternative 2 would require the removal of trees, fewer trees would be removed under this alternative as only 87 future residences would be constructed across the project site. Therefore, Alternative 2 would not have a substantial adverse impact on scenic vistas or state scenic highways. Impacts would be less than significant under Alternative 2, similar to the proposed project.

Alternative 2 would involve construction of fewer residences and fewer roadways within the project site, and would remove fewer trees compared to the proposed project, which would result in reduced impacts to the project site's existing visual character. Additionally, Alternative 2 would implement Mitigation Measure BIO-2 which would reduce impacts related to tree removal to a less than significant level. Additionally, because only 87 residences would be constructed across the project site under Alternative 2, impacts to public views of the project site would be slightly reduced under this alternative. Therefore, impacts to the existing visual character or quality of public views of the project site would be less than significant with mitigation under Alternative 2, similar to the proposed project.

Similar to the proposed project, Alternative 2 would introduce new sources of light and glare to the project site compared to existing conditions. However, because Alternative 2 would result in the future construction of 9 fewer residences than the proposed project, new sources of light and glare would be reduced. Similar to the proposed project, Alternative 2 would implement Mitigation Measure AES-4, which would reduce light and glare impacts to a less than significant level. Impacts under Alternative 2 would be less than significant with mitigation, similar to the proposed project.

b. Air Quality

Alternative 2 would involve fewer residences and therefore a reduction in residents compared to the proposed project. Accordingly, Alternative 2 would not conflict with or obstruct implementation of the Bay Area Air Quality Management District's (BAAQMD) 2017 Clean Air. Additionally, because this alternative would involve construction of 9 fewer units, construction-generated emissions and operational emissions would be reduced compared to the proposed project. However, as the overall infrastructure to support the development would still be needed, Alternative 2 may result in higher air quality impacts, as it would not be consistent with General Plan goals that encourage compact development and efficient land use. Therefore, Alternative 2 would not result in a cumulatively conservable net increase of any criteria pollutant for which the project region is in non-attainment. Impacts under Alternative 2 would be less than significant, similar to the proposed project.

Alternative 2 would involve construction of residences within the same portions of the project site, nearby sensitive receptors. Alternative 2 would implement Mitigation Measure AQ-1 which would reduce construction-related emissions. Alternative 2 would not result in other emissions that would adversely affect a substantial number of people. Overall, impacts related to air quality would be less than significant with mitigation under Alternative 2, similar to the proposed project.

c. Biological Resources

Four special status wildlife species are known to occur or have the potential to occur within the project site. Due to the reduction in number units, slightly less of the project site would be disturbed by Alternative 2, and impacts to special status species and sensitive communities would be minimally reduced. However, Alternative 2 would still potentially impact special status species and sensitive natural communities during construction and operation, and implementation of Mitigation Measures BIO-1(a) through BIO-1(c) would be required. Impacts to these biological resources under Alternative 2 would be less than significant with mitigation, similar to the proposed project.

The project site is not known to contain regionally significant wildlife corridors or habitat linkages, and due to surrounding development, the proposed project would not significantly impede wildlife movement. Alternative 2 would involve 9 fewer residences, which would leave only slightly more of the project site available for local wildlife movement compared to the proposed project. Impacts to wildlife movement under Alternative 2 would be less than significant, similar to the proposed project.

The proposed project would require the removal of 22 trees. Because Alternative 2 would involve development of fewer residential units, slightly fewer trees would need to be removed under this alternative. Similar to the proposed project, Alternative 2 would preserve the existing trees as much as possible. Tree replanting under the direction of a qualified forester, arborist, or horticulturalist pursuant to Sebastopol Municipal Code (SMC) would also be required under this alternative. Implementation of Mitigation Measure BIO-2 would be required. Impacts would be less than significant with mitigation under Alternative 2, similar to the proposed project.

d. Cultural Resources

Because this alternative would involve the construction of 9 fewer residences, less grading and excavation would occur compared to the proposed project. While grading and excavation that would occur under Alternative 2 could potentially unearth, adversely change, or damage previously unidentified archaeological resources, this alternative's potential to do so is slightly reduced compared to the proposed project due to its smaller development footprint. Although Mitigation

Measure CUL-2 would still be required under this alternative, potential impacts to cultural resources would be slightly reduced under Alternative 2. Impacts under Alternative 2 would be less than significant with mitigation, similar to the proposed project.

e. Geology and Soils

The project site is not located on an active or inactive fault. Therefore, Alternative 2 would not directly or indirectly cause potential adverse effects involving rupture of a known earthquake fault, and impacts would be less than significant, similar to the proposed project. The project site is located in a seismically active region, and seismic ground shaking could result in risk of property damage and injury or death to project occupants. As under the proposed project, development facilitated by Alternative 2 would be required to comply with California Building Code and would implement geotechnical investigation recommendations as required by SMC Chapter 16.40, which would minimize risk of damage, injury, or death related to seismic ground shaking. Additionally, because Alternative 2 would involve fewer residents on site, risks of damage, injury, and death would be reduced. Therefore, impacts related to strong seismic ground shaking under Alternative 2 would be less than significant, similar to the proposed project.

Portions of the project site are located on potentially expansive soil, which could create risks to life or property. Similar to the proposed project, Alternative 2 would implement seismic and soil stability measures included in the project geotechnical report, as required by SMC Chapter 16.40. Incorporation of these measures would ensure that impacts related to expansive soils would be less than significant. Additionally, Alternative 2 would involve reduced development compared to the proposed project, and would therefore result in less risk related to expansive soils. Impacts related to expansive soils under Alternative 2 would be less than significant, similar to the proposed project.

Construction of Alternative 2 would require grading and excavation, which could result in soil erosion or the loss of topsoil. Similar to the proposed project, construction activities under this alternative would be subject to NPDES Construction General Permit requirements, which would include preparation of a SWPPP. The SWPPP would include best management practices to reduce soil erosion and sedimentation. Because Alternative 2 would involve reduced development compared to the proposed project, less grading and excavation would be required. Therefore, with implementation of NPDES requirements, impacts related to soil erosion and the loss of topsoil under Alternative 2 would be less than significant, similar to the proposed project.

The project site has a low risk of liquefaction, landslides, lateral spreading, subsidence, and ground failure. Alternative 2 would also be required to implement design recommendations from the geotechnical report to minimize risk of substantial adverse effects related to seismic ground failure pursuant to SMC Chapter 16.40. Because Alternative 2 would involve reduced development compared to the proposed project, fewer project occupants would be at risk of seismic ground failure. Impacts under Alternative 2 would be less than significant, similar to the proposed project.

As discussed in Section 4.5, *Geology and Soils,* the project is underlain by a single geologic unit with high potential paleontological sensitivity. Alternative 2 would be required to implement Mitigation Measure GEO-7 which would ensure that potential impacts to paleontological resources are less than significant. Alternative 2 would involve reduced development compared to the proposed project, and would therefore have a slightly reduced risk of impacting paleontological resources or geologic features. Impacts under Alternative 2 would be less than significant with mitigation, similar to the proposed project.

f. Greenhouse Gas Emissions

Similar to the proposed project, Alternative 2 would generate temporary GHG emissions during construction and long-term increases in GHG emissions associated with operation. As discussed in Section 4.6, *Greenhouse Gas Emissions,* the proposed project would generate emissions that would exceed emission reduction goals established by BAAQMD GHG thresholds. While this alternative would generate a similar amount of construction-related GHG emissions per residence, Alternative 2 would involve 9 fewer residential units than the proposed project and thus a reduced total amount of GHG emissions during construction and operation. However, emissions per capita would remain the same, and Alternative 2 would similarly exceed the emission reduction goals, and would result in slightly higher VMT, as discussed further under *Transportation*. Therefore, similar to the proposed project, Alternative 2 would implement Mitigation Measure GHG-1, which would reduce impacts to a less than significant level. Alternative 2 would also be consistent with applicable plans, policies, and regulations adopted for the purpose of reducing GHG emissions. Impacts under Alternative 2 related to consistency with applicable plans would be less than significant, and reduced as compared to the proposed project.

Overall, impacts related to GHG emissions under Alternative 2 would be less than significant with mitigation, similar to the proposed project.

g. Hazards and Hazardous Materials

Compared to the proposed project, Alternative 2 would result in 9 fewer residential units being constructed, thereby reducing hazardous material use, storage and transportation resulting from construction of those units. The operation of the site for residential use would remain the same, similar to the proposed project. Alternative 2 would be subject to the same regulations as the proposed project. Impacts under Alternative 2 related to transport, use, disposal, or upset of hazardous materials would be less than significant, similar to the proposed project.

The project site is located within 0.25 mile of a school and associated with an open Voluntary Agreement clean up case. The existing conditions at this known release site would result in a potentially significant hazard to the public or the environment during grading and construction at the project site. Alternative 2 would be required to implement Mitigation Measures HAZ-3a and HAZ-3b, which would remediate the on-site soil contaminants present at the project site to less than significant levels.

The project site is not located within an airport land use plan or a mapped Fire Hazard Severity Zone. Similar to the proposed project, Alternative 2 would not result in impacts related to airport safety or wildland fires. Alternative 2 would develop residential units and internal roadways similar to those of the proposed project. Therefore, it can reasonably be assumed that Alternative 2 would not impair with an adopted emergency response or evacuation plan and impacts would be less than significant, similar to the proposed project.

Overall, impacts related to hazards under Alternative 2 would be less than significant with mitigation, similar to the proposed project.

h. Hydrology and Water Quality

Similar to the proposed project, construction activities under Alternative 2 could result in soil erosion due to earth-moving activities such as excavation, grading, soil compaction and moving, and soil stockpiling. Furthermore, operational activities, including the introduction of new impervious surfaces to the site, could also impact surface and groundwater quality. As discussed in Section 4.8, *Hydrology and Water Quality,* compliance with applicable local, state, and federal regulations and required permits would reduce the project's risk of water degradation from soil erosion and other construction pollutants, and risk of interfering with stormwater recharge. Similarly, Alternative 2 would be subject to the same regulations and required permits, and therefore would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Impacts would be less than significant, and similar to the proposed project.

Groundwater is not anticipated to be encountered during construction. Water use during construction, mostly for dust suppression spraying, would be temporary and limited to the construction period, which would be reduced under Alternative 2. Therefore, water use during construction of Alternative 2 would be only slightly reduced compared to the proposed project and Alternative 2 would similarly not deplete groundwater sources. Alternative 2 would construct 9 fewer residences which would require fewer driveways, and therefore result in slightly less impervious surfaces than the proposed project. Similar to the proposed project, runoff from impervious surfaces would be detained in detention basins and recharged adjacent to the site, resulting in the same amount of groundwater recharge post-project as under existing conditions. Therefore, Alternative 2 would not substantially interfere with groundwater recharge at the project site. Impacts under Alternative 2 would be less than significant, similar to the proposed project.

Similar to the proposed project, Alternative 2 would be required to implement erosion and sedimentation controls under the NPDES General Permit and SMC, and North Coast RWQCB requirements. Stormwater runoff would be captured and controlled by on-site detention facilities, as under the proposed project. This alternative would result in less new impervious surfaces at the project site due to the reduced amount of development, would be required to implement sedimentation and erosion control measures and stormwater capture measures, and would result in less alteration of on-site drainage patterns. Therefore, Alternative 2 would not result in substantial erosion or siltation on or off site or contribute runoff that would exceed the capacity of planned drainage systems. Impacts under Alternative 2 would be less than significant, similar to the proposed project.

As discussed in Section 4.8, *Hydrology and Water Quality,* the proposed project would not degrade the water quality of surface water or groundwater within the planning area of the North Coast RWQCB Basin Plan or Santa Rosa Groundwater Management Plan. Alternative 2 would comply with relevant water quality regulations and policies, including NPDES Construction General Permit, North Coast RWQCB Order No. R1-2015-0030, and SMC requirements, which would reduce the risk of water degradation from soil erosion and other pollutants related to project construction and operational activities. Therefore, Alternative 2 would not conflict with or obstruct implementation of the Basin Plan. Furthermore, as under the proposed project, Alternative 2 would comply with established regulations and requirements for stormwater control, including through the implementation of post-construction stormwater management controls and construction of on-site stormwater detention areas. Therefore, Alternative 2 would not conflict with or obstruct implementation of the applicable water quality control plan or the sustainable groundwater management plan. Impacts under Alternative 2 would be less than significant, similar to the proposed project.

i. Land Use and Planning

Similar to the proposed project, Alternative 2 would occur on an undeveloped project site which would not separate existing communities. As such, Alternative 2 would not physically divide an established community. No impact would occur, similar to the proposed project.

As demonstrated in Tables 4.9-1 and 4.9-2 of Section 4.9, *Land Use and Planning,* the proposed project would be consistent with the City of Sebastopol General Plan and the SMC. Because Alternative 2 would involve reduced development compared to the proposed project, Alternative 2 would also be consistent with the policies of the General Plan and the SMC that have the purpose of avoiding or mitigating an environmental effect. Impacts under Alternative 2 would be less than significant, similar to the proposed project.

j. Noise

Similar to the proposed project, construction of Alternative 2 would result in temporary noise in the project site vicinity, exposing surrounding nearby receivers to increased noise levels. Construction of the proposed project would include noise from the site preparation, grading, building construction, paving and architectural coating phases of construction. This would also occur under Alternative 2; however, because Alternative 2 would involve slightly reduced development compared to the proposed project, fewer residences would be constructed under Alternative 2, which would decrease the amount of construction noise and vibration that would occur. Additionally, Alternative 2 would implement Mitigation Measure NOI-1 which would reduce operational noise impacts. Therefore, impacts would be reduced, and operational noise under Alternative 2 would not exceed City Exterior Noise Thresholds as shown in Section 4.10, *Noise.* Impacts related to construction and operational noise and vibration under Alternative 2 would be less than significant with mitigation, similar to the proposed project.

k. Population and Housing

The proposed project would result in the construction of 80 units, with the potential for up to 16 ADUs on a currently undeveloped site. Alternative 2 has a reduced total buildout of 73 residential units with the potential for up to 14 ADUs which would result in the addition of 19 fewer residents[1] to the total city population compared to the proposed project. Similar to the proposed project, Alternative 2 would occur on an undeveloped site which would not displace existing people or housing. Impacts related to population growth under Alternative 2 would be less than significant, similar to the proposed project.

l. Public Services

The proposed project would not result in a significant population increase which would require the addition of new police or fire protection facilities, schools, parks, or public facilities. Alternative 2 would result in 9 fewer residential units than the proposed project. Therefore, it can be assumed that Alternative 2 would result in less than significant impacts to public services, similar to the proposed project.

m. Transportation

As discussed in Section 4.13, *Transportation,* the project would conflict with the City of Sebastopol General Plan. Similar to the proposed project, Alternative 2 would be required to implement Mitigation Measure TRA-1 which would provide a safe crossing location for pedestrians, and as a result, this alternative would not conflict with a program, plan, ordinance, or policy addressing transit or roadway facilities. Therefore, impacts would be less than significant with mitigation, similar to the proposed project.

[1] 19 residents = 204 residents under proposed project - (84 units*2.12 residents per household)

The proposed project would generate new vehicle miles traveled (VMT) to and from the project site. As discussed in Section 4.13, *Transportation,* the proposed project would not result in a significant VMT impact. Alternative 2 would involve the future operation of only 84 residences, as compared to the 96 residences evaluated under the proposed project. As discussed in Section 4.13, *Transportation*, a reduction to the transportation model's VMT was applied to capture VMT reductions associated with an increase in residential density over 9.1 units per acre. Because Alternative 2 would result in a less dense development buildout compared to the proposed project, it is assumed to cause a greater VMT impact. Impacts under Alternative 2 would be slightly increased as compared to the proposed project.

Similar to the proposed project, vehicle use associated with the proposed project would not generate hazards associated with incompatible uses or vehicles on roadways. Similar to the proposed project, Alternative 2 would include interior roadways. Therefore, Alternative 2 would result in less than significant impacts related to transportation hazards and emergency access, and similar to the proposed project.

n. Tribal Cultural Resources

Because this alternative would involve the construction of 9 fewer residences, less grading and excavation would occur compared to the proposed project. While grading and excavation that would occur under Alternative 2 could potentially unearth, adversely change, or damage previously unidentified tribal cultural resources, this alternative's potential to do so is slightly reduced compared to the proposed project due to its smaller development footprint. Although Mitigation Measure TCR-1 would still be required under this alternative, potential impacts to tribal cultural resources would be slightly reduced under Alternative 2. Impacts under Alternative 2 would be less than significant with mitigation, similar to the proposed project.

o. Utilities and Service Systems

As discussed in Section 4.15, *Utilities and Service Systems,* the proposed project would be consistent with growth anticipated by the City and would not require relocation or construction of new or expanded water facilities. Alternative 2 would involve 9 fewer residences; therefore, the growth facilitated by Alternative 2 would be reduced as compared to the proposed project, and would also be within growth anticipated by the City. Impacts to water facilities under Alternative 2 would be less than significant, similar to the proposed project.

Similar to the proposed project, wastewater generated from future residential development on the project site would be serviced by existing wastewater infrastructure under Alternative 2. The amount of wastewater generated by the proposed project would be within the capacity for the Sub-regional Water Reclamation System Treatment Plant. Alternative 2 would result in 9 fewer residences; therefore, the growth under Alternative 2 would be slightly reduced as compared to the proposed project and would be within the growth anticipated by the City. Therefore, no additional expansion of existing wastewater services would be required. Impacts would be less than significant, similar to the proposed project.

Similar to the proposed project, Alternative 2 would be required to meet all City policies and discharge requirements for stormwater. Specifically, compliance with SMC Chapter 13.20 and SMC Chapter 15.78 would ensure that adequate stormwater drainage facilities would be provided on site. Stormwater generated by Alternative 2, as under the proposed project, would be routed to proposed on-site detention ponds or existing detention pond for the adjacent office park.

Therefore, the project would not require expansion of existing stormwater services, and impacts would be less than significant, similar to the proposed project.

As discussed in Section 4.15, *Utilities and Service Systems,* the City would have adequate supplies during normal, dry, and multiple dry years available to serve the project. As described above, Alternative 2 would require less water than the proposed project; therefore, the City would have adequate water supplies to serve the project site in normal, dry, and multiple dry years. Impacts under Alternative 2 would be less than significant, similar to the proposed project.

The proposed project is estimated to generate approximately 214 tons of solid waste per year, or less than one percent of the remaining capacity of the Central Disposal Site. Alternative 2 would involve the future construction and operation of 9 fewer residences than the proposed project. Therefore, Alternative 2 would generate less solid waste, which would still be less than one percent of Central Disposal Site's remaining capacity. Alternative 2 would also be required to comply with applicable local and state solid waste reduction measures. Therefore, impacts to related to solid waste under Alternative 2 would be less than significant, and similar to the proposed project.

p. Impacts Found to be Less Than Significant

Section 4.16, *Impacts Found to be Less Than Significant*, found that the proposed project would not have a significant impact to the following resources: Agriculture and Forestry, Energy, Minerals, Recreation, and Wildfire. Alternative 2 would result in the following impacts to the aforementioned resource areas:

- Agriculture and Forestry: No impacts would occur under Alternative 2, similar to the proposed project.
- Energy: Impacts under Alternative 2 would be less than significant, similar to the proposed project.
- Minerals: No impacts would occur under Alternative 2, similar to the proposed project.
- Recreation: Impacts under Alternative 2 would be less than significant, similar to the proposed project.
- Wildfire: No impacts would occur under Alternative 2, similar to the proposed project.

6.3 Alternative 3: Increased Development Density

6.3.1 Description

Alternative 3 would involve an increased total buildout of 103 residential units. Alternative 3 would not include the potential for ADUs. Because this alternative would involve 23 more single-family residences compared to the proposed project, more grading and excavation would be required as more unit and utility connections would be constructed, and 27 more on-site trees would be removed. Alternative 3 would result in a maximum building height of 3 stories, similar to the proposed project. Furthermore, less of the project site would be available for open space and less trees would remain on site compared to the proposed project. New utility infrastructure would still be required on the project site under this alternative, including stormwater retention basins, internal roadways and parking, and water pipelines between existing water line infrastructure and proposed townhomes.

Alternative 3 would meet the project objectives, similar to the proposed project. These objectives include constructing a single, cohesive development consisting of high-quality, contemporary urban design that respects and relates well to its surroundings and respects the urban forestry that will remain; and bolstering the connection between the community and the West County Trail through the preservation of existing pathways and ensuring continued use of the trail. However, Alternative 3 would not meet goals related to increasing diverse housing inventory as effectively as the proposed project since ADA-accessible ADUs would not be included and would not meet project objectives related to preserving the existing urban forest to the same extent as the proposed project.

6.3.2 Impact Analysis

a. Aesthetics

There are no scenic routes within the vicinity of the project site, the project site is not visible from state scenic highways, and future residences would be shielded from view by the existing topography of the project site. Construction of future residences under Alternative 3 would not be visible from scenic routes identified by the City or state scenic highways. Therefore, Alternative 3 would be similar to the proposed project and would not have a substantial adverse impact on scenic vistas or state scenic highways. Impacts would be less than significant under Alternative 3, similar to the proposed project.

Alternative 3 would involve construction of more residences and more roadways within the project site, and would remove more trees compared to the proposed project, which would result in increased impacts to the project site's existing visual character. Alternative 3 would require the removal of 27 trees, which is 5 more trees than the proposed project. However, Alternative 3 would implement Mitigation Measure BIO-2 which would reduce impacts related to tree removal to a less than significant level. Additionally, because 103 residences would be constructed across the project site under Alternative 3, impacts to public views of the project site would be slightly increased under this alternative due to increased residential density overall. Alternative 3 would result in more single-family residences and less trees on-site, which would affect the views from surrounding areas. Overall, impacts to the existing visual character or quality of public views of the project site would be increased compared to the proposed project, yet remain less than significant with mitigation under Alternative 3.

Similar to the proposed project, Alternative 3 would introduce new sources of light and glare to the project site compared to existing conditions. However, because Alternative 3 would result in the future construction of 12 more residences than the proposed project, new sources of light and glare would be increased. Similar to the proposed project, Alternative 3 would implement Mitigation Measure AES-4, which would reduce light and glare impacts to a less than significant level. Impacts under Alternative 3 would be less than significant with mitigation, similar to the proposed project.

b. Air Quality

Alternative 3 would involve the same amount of grading as the proposed project; however, this alternative would require the use of additional construction equipment and/or a longer construction period compared to the proposed project as more residential units would be built. Similarly, this alternative would increase operational emissions, as this alternative would accommodate 23 more residences than the proposed project, for a total of 15 more residents.[2] Therefore, it can reasonably be assumed that Alternative 3 would result in slightly higher pollutant

[2] 15 residents = 204 residents under proposed project - (103 units*2.12 residents per household)

emissions than the proposed project. Impacts would be slightly increased compared to the proposed project but would remain less than significant.

Similar to the proposed project, Alternative 3 would potentially expose sensitive receptors to pollutant concentrations during construction. Mitigation Measure AQ-1 would still be required under this alternative, and impacts would be slightly increased due to additional construction. However, emissions would not substantially increase under this alternative because construction would generally be similar to the proposed project. Further, while this alternative would involve 23 more residences than the proposed project, the quantity of construction equipment and overall construction timeline would be comparable to the proposed project. Impacts would be less than significant. Additionally, construction-related odors would be short-term and temporary, and Alternative 3 would not result in other emissions that would adversely affect a substantial number of people.

Overall, impacts related to air quality would be slightly increased under Alternative 3 compared to the proposed project, but impacts would remain less than significant with mitigation.

c. Biological Resources

Despite the higher density, Alternative 3 would disturb slightly more area than the proposed project. Therefore, this alternative would result in similar impacts to special-status plant and animal species. Like the proposed project, Alternative 3 would require implementation of Alternative 2 would still potentially impact special status species and sensitive natural communities during construction and operation, and implementation of Mitigation Measures BIO-1(a) through BIO-1(c) would be required. Impacts to these biological resources under Alternative 2 would be less than significant with mitigation, similar to the proposed project.

The proposed project would require the removal of 22 trees. Because Alternative 3 would involve development of more residential units, 5 more trees would need to be removed under this alternative. Similar to the proposed project, Alternative 3 would preserve the existing trees as much as possible. Tree replanting under the direction of a qualified forester, arborist, or horticulturalist pursuant to Sebastopol Municipal Code (SMC) would also be required under this alternative. Implementation of Mitigation Measure BIO-2 would be required. Impacts would be less than significant with mitigation under Alternative 3, similar to the proposed project.

As with the proposed project, Alternative 3 would not impact riparian or sensitive natural communities as the project site does not contain such features. Further, similar to the proposed project, Alternative 3 would not interfere with wildlife movement as no known regionally significant wildlife movement corridors or habitat linkages are known to occur in the project site, and Alternative 3 would not conflict with local policies or ordinances protecting biological resources.

Overall, impacts to biological resources would be similar to the proposed project under Alternative 3 and would be less than significant with mitigation.

d. Cultural Resources

Because this alternative would involve the construction of 15 more residences, slightly more grading and excavation would occur compared to the proposed project. This alternative would involve grading and excavation of the same area as the proposed project, and these ground-disturbing activities could potentially unearth, adversely change, or damage previously unidentified archaeological resources. Mitigation Measure CUL-2 would be required under this alternative, and impacts would be less than significant with mitigation, similar to the proposed project.

e. Geology and Soils

Alternative 3 would be subject to the same seismic and soil-related hazards as the proposed project. Alternative 3 would involve construction of 23 additional units and would therefore facilitate a larger project site population compared to the proposed project. Therefore, the risk of loss, injury, or death involving rupture of a known earthquake fault, ground shaking, ground failure, seismic-related liquefaction, landslides, lateral spreading, and subsidence would be slightly increased compared to the proposed project.

Portions of the project site are located on potentially expansive soil, which could create risks to life or property. Similar to the proposed project, Alternative 3 would implement seismic and soil stability measures included in the project geotechnical report, as required by SMC Chapter 16.40. Incorporation of these measures would ensure that impacts related to expansive soils would be less than significant. Impacts related to expansive soils under Alternative 3 would be less than significant, similar to the proposed project.

Alternative 3 would also be required to implement an SWPPP to minimize impacts related to soil erosion or the loss of topsoil, and impacts would be less than significant. Due to the presence of a geologic unit with high paleontological sensitivity, Alternative 3 would require implementation of Mitigation Measure GEO-7 and impacts to paleontological resources would be less than significant.

Overall, Alternative 3 would result in slightly increased impacts related to geology and soils compared to the proposed project, though impacts would remain less than significant with mitigation.

f. Greenhouse Gas Emissions

Similar to the proposed project, Alternative 3 would generate temporary GHG emissions during construction and long-term increases in GHG emissions associated with operation. The proposed project would add a total of 204 new residents to the project site and Alternative 3 would add an additional 15 residents compared to the proposed project. As such, the service population and the GHG emissions associated with Alternative 3 would increase. This increase would occur mostly due to increased vehicle trips associated with this alternative. Alternative 3 would include additional emissions, it would result in more GHG emissions overall compared to the proposed project and therefore result in greater impacts. Alternative 3 would similarly exceed the emission reduction goals. Therefore, similar to the proposed project, Alternative 3 would implement Mitigation Measure GHG-1, which would reduce impacts to a less than significant level. Alternative 3 would also be consistent with applicable plans, policies, and regulations adopted for the purpose of reducing GHG emissions. Impacts under Alternative 3 related to consistency with applicable plans would be less than significant, similar to the proposed project.

Overall, Alternative 3 would increase impacts related to GHG emissions, although impacts would remain less than significant.

g. Hazards and Hazardous Materials

Compared to the proposed project, Alternative 3 would result in 23 more residential units being constructed, thereby increasing hazardous material use, storage and transportation resulting from construction of those units. However, Alternative 3 would only result in 15 additional residents compared to the proposed project. The operation of the site for residential use would remain the same, similar to the proposed project. Alternative 3 would be subject to the same regulations as the proposed project. Impacts under Alternative 3 related to transport, use, disposal, or upset of hazardous materials would be less than significant, similar to the proposed project.

The project site is located within 0.25 mile of a school and associated with an open Voluntary Agreement clean up case. The existing conditions at this known release site would result in a potentially significant hazard to the public or the environment during grading and construction at the project site. Alternative 3 would be required to implement Mitigation Measures HAZ-3a and HAZ-3b, which would remediate the on-site soil contaminants present at the project site to less than significant levels.

The project site is not located within an airport land use plan or a mapped Fire Hazard Severity Zone. Similar to the proposed project, Alternative 3 would not result in impacts related to airport safety or wildland fires. Alternative 3 would develop 23 more residential units and internal roadways compared to the proposed project. However, the development footprint would remain the same and Alternative 3 would result in roughly 15 new residents compared to the proposed project. Therefore, it can reasonably be assumed that Alternative 3 would not impair with an adopted emergency response or evacuation plan and impacts would be less than significant, similar to the proposed project.

Overall, impacts related to hazards under Alternative 3 would be less than significant with mitigation, similar to the proposed project.

h. Hydrology and Water Quality

Similar to the proposed project, construction activities under Alternative 3 could result in soil erosion due to earth-moving activities such as excavation, grading, soil compaction and moving, and soil stockpiling. Furthermore, operational activities, including the introduction of new impervious surfaces to the site, could also impact surface and groundwater quality. As discussed in Section 4.8, *Hydrology and Water Quality,* compliance with applicable local, state, and federal regulations and required permits would reduce the project's risk of water degradation from soil erosion and other construction pollutants, and risk of interfering with stormwater recharge. Similarly, Alternative 3 would be subject to the same regulations and required permits, and therefore would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Impacts would be less than significant, and similar to the proposed project.

Groundwater is not anticipated to be encountered during construction. Water use during construction, mostly for dust suppression spraying, would be temporary and limited to the construction period, which would be slightly increased under Alternative 3 but would similarly not deplete groundwater sources. Alternative 3 would construct 23 more residences which would require more driveways, and therefore result in more impervious surfaces than the proposed project. Similar to the proposed project, runoff from impervious surfaces would be retained in retention basins and recharged on site, resulting in the slightly increased groundwater recharge post-project as the proposed project. Therefore, Alternative 3 would not substantially interfere with groundwater recharge at the project site. Impacts under Alternative 3 would be less than significant, similar to the proposed project.

Similar to the proposed project, Alternative 3 would be required to implement erosion and sedimentation controls under the NPDES General Permit and SMC, and North Coast RWQCB requirements. Stormwater runoff would be captured and controlled by on-site detention facilities, as under the proposed project. This alternative would result in more new impervious surfaces at the project site due to the increased amount of development but would be required to implement sedimentation and erosion control measures and stormwater capture measures as the proposed project. Therefore, Alternative 3 would not result in substantial erosion or siltation on or off site or contribute runoff that would exceed the capacity of planned drainage systems. Impacts under Alternative 3 would be less than significant, similar to the proposed project.

As discussed in Section 4.8, *Hydrology and Water Quality,* the proposed project would not degrade the water quality of surface water or groundwater within the planning area of the North Coast RWQCB Basin Plan or Santa Rosa Groundwater Management Plan. Alternative 3 would comply with relevant water quality regulations and policies, including NPDES Construction General Permit, North Coast RWQCB Order No. R1-2015-0030, and SMC requirements, which would reduce the risk of water degradation from soil erosion and other pollutants related to project construction and operational activities. Therefore, Alternative 3 would not conflict with or obstruct implementation of the Basin Plan. Furthermore, as under the proposed project, Alternative 3 would comply with established regulations and requirements for stormwater control, including through the implementation of post-construction stormwater management controls and construction of on-site stormwater detention areas. Therefore, Alternative 3 would not conflict with or obstruct implementation of the applicable water quality control plan or the sustainable groundwater management plan. Impacts under Alternative 3 would be less than significant, similar to the proposed project.

i. Land Use and Planning

Similar to the proposed project, Alternative 3 would occur on an undeveloped project site which would not separate existing communities. As such, Alternative 3 would not physically divide an established community. No impact would occur, similar to the proposed project.

As demonstrated in Tables 4.9-1 and 4.9-2 of Section 4.9, *Land Use and Planning,* the proposed project would be consistent with the City of Sebastopol General Plan and the SMC. Although Alternative 3 would result in 23 more residential units compared to the proposed project, they would be located within the same development footprint. Furthermore, Alternative 3 would result in a population increase of approximately 15 residents compared to the proposed project. Therefore, it can reasonably be assumed that Alternative 3 would continue to meet the same General Plan goals and policies that the proposed project does. Alternative 3 would also be subject to the same SMC development standards as the proposed project and would require the City's approval of a Conditional Use Permit for 80 townhouse units within the OLM zoning district, site development review, and a Vesting Tentative Map. In addition, Alternative 3 would require the use of a State Density Bonus to allow for a waiver to increase the building height to three stories. Alternative 3 would be consistent with the uses and development standards allowed within the R7 district with the requested waiver for building height. Alternative 3 would not result in conflicts to any applicable plans or policies, and impacts would be less than significant, similar to the proposed project.

j. Noise

Similar to the proposed project, construction of Alternative 3 would result in temporary noise in the project site vicinity, exposing surrounding nearby receivers to increased noise levels. Construction of the proposed project would include noise from the site preparation, grading, building construction, paving and architectural coating phases of construction. Construction of Alternative 3 would involve similar construction equipment to the proposed project, which would not generate noise that would exceed established standards. However, because of increased buildout, Alternative 3 would involve the use of additional construction equipment and/or a longer construction period. As a result, impacts related to construction noise and groundborne vibration would be slightly increased under Alternative 3. However, such impacts are anticipated to remain less than significant.

Additionally, because Alternative 3 would result in a site population of 219, approximately 15 more residents than the proposed project, operational noise associated with mechanical equipment and traffic would be increased as well. Alternative 3 would implement Mitigation Measure NOI-1 which would reduce operational noise impacts. Therefore, impacts would be reduced, and operational noise under Alternative 3 would not exceed City Exterior Noise Thresholds as shown in Section 4.10, Noise. Impacts related to construction and operational noise and vibration under Alternative 3 would be less than significant with mitigation, similar to the proposed project.

Similar to the proposed project, Alternative 3 would not be within two miles of an airport or an airport land use plan. Therefore, noise impacts related to airports would be less than significant under this alternative, as they are for the proposed project. Overall, impacts related to noise would be slightly greater compared to the proposed project and impacts would be less than significant.

k. Population and Housing

The proposed project would result in the construction of 103 units, an increase of 23 residential units compared to the proposed project. Alternative 3 would result in the addition of 15 more residents[3] to the total city population compared to the proposed project. However, similar to the proposed project, Alternative 3 would occur on an undeveloped site which would not displace existing people or housing. Impacts related to population growth under Alternative 3 would be less than significant, similar to the proposed project.

l. Public Services

The proposed project would not result in a significant population increase which would require the addition of new police or fire protection facilities, schools, parks, or public facilities. Alternative 3 would result in 23 more residential units compared to the proposed project. However, this would translate to a population increase of 15 residents which would not constitute a significant population increase which might require new or physically altered public services to meet service ratios. Therefore, it can be assumed that Alternative 3 would result in less than significant impacts to public services, similar to the proposed project.

m. Transportation

As discussed in Section 4.13, *Transportation*, the project would conflict with the City of Sebastopol General Plan. Similar to the proposed project, Alternative 3 would be required to implement Mitigation Measure TRA-1, which would provide a safe crossing location for pedestrians, and as a result, this alternative would not conflict with a program, plan, ordinance, or policy addressing transit or roadway facilities. Therefore, impacts would be less than significant with mitigation, similar to the proposed project.

The proposed project would generate new VMT to and from the project site. As discussed in Section 4.13, *Transportation*, the proposed project would not result in a significant VMT impact. Alternative 3 would involve the future operation of 103 residences, as compared to the 96 residences evaluated under the proposed project. However, as discussed in Section 4.13,

[3] 15 residents = 204 residents under proposed project - (103 units*2.12 residents per household)

Transportation, a reduction to the transportation model's VMT was applied to capture VMT reductions associated with an increase in residential density over 9.1 units per acre. Because Alternative 3 would result in an increased density as compared to the proposed project, this would result in a lessened VMT impact overall. Impacts related to VMT under Alternative 3 would be slightly reduced as compared to the proposed project.

Alternative 3 would involve similar site access points as the proposed project and vehicle use associated with the proposed project would not generate hazards associated with incompatible uses or vehicles on roadways. Therefore, Alternative 3 would not substantially increase hazards associated with incompatible uses or vehicles on roadways, would provide adequate emergency access, and would have less than significant impacts. Overall, transportation impacts of Alternative 3 would be less than significant with mitigation, and slightly less than the impacts of the proposed project.

n. Tribal Cultural Resources

Despite the higher density, Alternative 3 would disturb the same area as the proposed project. Though there are no known tribal cultural resources present within the project site, it is possible that ground disturbance during construction of Alternative 3 could encounter unknown tribal cultural resources. Mitigation Measure TCR-1 would be required under this alternative, which would ensure that any unanticipated discoveries of tribal cultural resources are avoided or, where avoidance is infeasible, mitigated to a less than significant level. Impacts related to tribal cultural resources would be similar to the proposed project and would be less than significant with mitigation.

o. Utilities and Service Systems

Alternative 3 would involve the construction of 23 more residential units than the proposed project, and would result in increased demand for water, wastewater, electric power, or telecommunications facilities. However, Alternative 3 would be located on the same site as the proposed project, which is within the City of Sebastopol's utility limits. Therefore, this alternative would not require new water supply facilities, beyond those associated with on-site project development. On-site improvements would be similar to those of the proposed project and would be slightly larger in size and capacity to serve the higher density development facilitated by this alternative. Impacts related to new or expanded water facilities would be less than significant, similar to the proposed project.

As with the proposed project, wastewater conveyance and treatment service for this alternative would be provided by the City of Sebastopol. As described in Section 4.15, *Utilities and Service Systems,* the proposed project would generate approximately 18,100 gallons per day of wastewater. Because development under Alternative 3 would be approximately 7 percent greater than the proposed project, this alternative would generate 7 percent more wastewater, or approximately 19,400 gallons per day. This represents approximately 2.3 percent of total Average Daily Dry Weather Flow entitlement capacity. Therefore, impacts related to wastewater and wastewater treatment capacities would remain less than significant under this alternative.

Similar to the proposed project, Alternative 3 would be required to meet all City policies and discharge requirements for stormwater. Specifically, compliance with SMC Chapter 13.20 and SMC Chapter 15.78 would ensure that adequate stormwater drainage facilities would be provided on site. Stormwater generated by Alternative 3, as under the proposed project, would be routed to proposed on-site detention ponds or existing detention pond for the adjacent office park.

Therefore, the project would not require expansion of existing stormwater services, and impacts would be less than significant, similar to the proposed project.

As described in Section 4.15, *Utilities and Service Systems,* the City would have adequate supplies during normal, dry, and multiple dry years available to serve the proposed project. Because Alternative 3 would involve 23 more units than the proposed project, or a 7 percent increase in the number of units, this alternative would involve a 7 percent increase in water demand, or approximately 10.3 million gallons per year. Similar to the proposed project, the water demand of Alternative 3 would represent less than 0.01 percent of the total City of Sebastopol water supply. Therefore, while sufficient water supply is available for buildout of Alternative 3, impacts related to water supply would be increased under this alternative. Impacts would be less than significant, similar to the proposed project.

The proposed project is estimated to generate approximately 214 tons of solid waste per year, or less than one percent of the remaining capacity of the Central Disposal Site. Alternative 3 would involve the future construction and operation of 23 more residences than the proposed project, resulting in roughly 230 tons of solid waste per year. Alternative 3 would generate more solid waste but would still be less than one percent of Central Disposal Site's remaining capacity. Alternative 3 would also be required to comply with applicable local and state solid waste reduction measures. Therefore, impacts to related to solid waste under Alternative 3 would be less than significant, and similar to the proposed project.

Overall, impacts related to wastewater, wastewater treatment capacities, solid waste capacities, and solid waste reduction would be less than significant, but greater than the proposed project.

p. Impacts Found to be Less Than Significant

Section 4.16, *Impacts Found to be Less Than Significant*, found that the proposed project would not have a significant impact to the following resources: Agriculture and Forestry, Energy, Minerals, Recreation, and Wildfire. Alternative 3 would result in the following impacts to the aforementioned resource areas:

- Agriculture and Forestry: No impacts would occur under Alternative 3, similar to the proposed project.
- Energy: Impacts under Alternative 3 would be less than significant, similar to the proposed project.
- Minerals: No impacts would occur under Alternative 3, similar to the proposed project.
- Recreation: Impacts under Alternative 3 would be less than significant, similar to the proposed project.
- Wildfire: No impacts would occur under Alternative 3, similar to the proposed project.

6.4 Alternatives Considered but Rejected

In addition to the aforementioned alternatives, two other potential alternatives were discussed but ultimately rejected. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts. 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). Section 15126.6 of the State CEQA Guidelines states that:

> "An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason."

Therefore, an EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative. Nevertheless, the following discusses the potential alternatives which were considered and the reasoning for their respective rejection from further analysis.

Location Alternative

The City considered an alternative location for the proposed project. However, another site of similar or larger acreage, was not identified. Therefore, it would not be feasible to evaluate an alternative location. CEQA Guidelines section 15126.6(a) allows for consideration of alternatives to a project, or its *location* (emphasis added), but does not mandate inclusion of a location alternative in an EIR. Accordingly, to evaluate another location for an 80+ unit residential development would not be meaningful for the purposes of informing a decision about the proposed project, and a Location Alternative is not discussed further.

Reduced Height Alternative

During the EIR scoping process, a reduction in proposed building height from three stories to two stories was discussed. The proposed project seeks approval of a State Density Bonus law waiver which would allow the project to increase building height from two stories to three stories. This would achieve a key project objective which is to allow diverse housing on the project site, including affordable housing options. Additionally, the project seeks to construct a development that respects and relates well to its surroundings and respects the urban forestry that will remain. To achieve denser housing on the project site while preserving as much of the existing trees, the project proposes three stories under the State Density Bonus law waiver. Therefore, reducing the height of the project would result in a reduction in the number of available units and would not meet key project objectives. Therefore, a Reduced Height Alternative is not discussed further.

6.5 Environmentally Superior Alternative

CEQA requires the identification of the environmentally superior alternative among the alternatives to the proposed project. The environmentally superior alternative must be an alternative that reduces some of the environmental impacts of the project, regardless of the financial costs associated. Identification of the environmentally superior alternative is an informational procedure and the alternative identified as the environmentally superior alternative may not be that which best meets the goals or needs of the proposed project. The EIR did not identify any significant and unavoidable impacts as a result of the proposed project. Therefore, none of the alternatives significantly reduce impacts resulting from the proposed project or eliminate the need for mitigation measures identified in the EIR.

Table 6-2 indicates whether each alternative's environmental impact is greater than, less than, or similar to that of the proposed project for each of the issue areas studied. Based on the alternatives analysis provided above, Alternative 1 would be the environmentally superior alternative. Alternative 1, No Project, assumes that the proposed development, and subsequent removal of trees and construction of utility connections and residences would not occur, and that the site would remain undeveloped. Therefore, no new impacts to environmental resource areas analyzed in this EIR would occur, and project mitigation measures would not be required. Although Alternative 1 would preserve lands for allowed uses and preserve existing woodlands, this alternative would not meet project objectives related to the provision of housing.

If the No Project Alternative is the environmentally superior alternative, CEQA requires that an environmentally superior alternative among the remaining alternatives be identified (CEQA Guidelines Section 15126.6[e]). Based on this consideration, Alternative 2 would be the environmentally superior alternative. Alternative 2 would slightly reduce impacts related to aesthetics and biological resources due to a reduced buildout and removal of less trees. However, Mitigation Measures BIO-1(a) through BIO-1(c) and BIO-2 would still be required. Alternative 2 would have similar impacts related to air quality, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, population and housing, public services, tribal cultural resources, and utilities as the proposed project. Alternative 2 would also result in greater impacts to VMT as compared to the proposed project. Alternative 2 would leave slightly more of the project site undeveloped and would result in less overall buildout on the project site. Alternative 2 would meet project objectives related to increasing housing inventory, including ADUs, that add diversity to the City of Sebastopol's ownership housing supply; encouraging housing affordability and providing housing opportunities for households at a variety of income levels and life stages; and creating a cohesive development that respects and relates well to its surroundings and respects the urban forestry that will remain. However, Alternative 2 would not meet these objectives as effectively as the proposed project as 9 fewer residences would be constructed under this alternative.

Alternative 3 would not significantly reduce any impacts compared to the proposed project. However, Alternative 3 would result in reduced impacts to VMT compared to the proposed project but would not significantly reduce transportation impacts overall and Mitigation Measure TRA-1 would still be required. It would result in similar impacts to biological resources, cultural resources, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, population and housing, public services, tribal cultural resources, and utilities as the proposed project, though mitigation identified in the EIR for respective issue areas would still be required. Impacts to aesthetics, air quality, geology and soils, and greenhouse gas emissions would be greater under Alternative 3 as compared to the proposed project. While impacts would generally be similar under Alternative 3, impacts would be reduced to a greater extent under Alternative 2 as it would involve less construction and development than Alternative 3. Therefore, Alternative 3 is not the environmentally superior alternative.

Table 6-2 Impact Comparison of Alternatives

Issue	Proposed Project Impact Classification	Alternative 1: No Project	Alternative 2: Reduced Density	Alternative 3: Increased Density
Aesthetics	Less than Significant with Mitigation Incorporated	+	+	-
Air Quality	Less than Significant with Mitigation Incorporated	+	=	-
Biological Resources	Less than Significant with Mitigation Incorporated	+	+	=
Cultural Resources	Less than Significant with Mitigation Incorporated	+	=	=
Geology and Soils	Less than Significant with Mitigation Incorporated	+	=	-
Greenhouse Gas Emissions	Less than Significant with Mitigation Incorporated	+	=	-
Hazards and Hazardous Materials	Less than Significant with Mitigation Incorporated	+	=	=
Hydrology and Water Quality	Less than Significant	+	=	=
Land Use and Planning	Less than Significant	+	=	=
Noise	Less than Significant with Mitigation Incorporated	+	=	=
Population and Housing	Less than Significant	+	=	=
Public Services	Less than Significant	+	=	=
Transportation	Less than Significant with Mitigation Incorporated	+	-	+
Tribal Cultural Resources	Less than Significant with Mitigation Incorporated	+	=	=
Utilities	Less than Significant	+	=	=
Impacts Found to be Less Than Significant	Less than Significant	+	=	=

+ Superior to the proposed project (reduced level of impact)

- Inferior to the proposed project (increased level of impact)

= Similar level of impact to the proposed project

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7.2 List of Preparers

This EIR was prepared by the City of Sebastopol, with the assistance of Rincon. Consultant staff involved in the preparation of the EIR are listed below.

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Julie Lynne Welch, Director of Due Diligence
Debra Jane Seltzer, Formatting Specialist
Chris Jackson-Jordan, GIS Analyst
Hannah Newby, Senior GIS Analyst

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Appendix A

Notice of Preparation (NOP)

NOTICE OF PREPARATION

Date: July 6, 2023

To: Responsible Agencies/Interested Parties

From: John Jay, Associate Planner
City of Sebastopol, Planning Department

SUBJECT: Notice of Preparation (NOP) of a Draft Environmental Impact Report (EIR) for The Canopy Residential Project -1009-1011 Gravenstein Highway North

The City of Sebastopol will be the Lead Agency and will prepare an Environmental Impact Report (EIR) for the Conditional Use Permit, Standard Subdivision Vesting Tentative Map, and State Density Bonus Law Waiver for development of The Canopy Residential Project. The 6.1-acre project site is located at 1009-1011 Gravenstein Highway North zoned Office/ Light Industrial (OLM) which permits residential density of 12.1-25 units per acres as a secondary use to office/light industrial uses. The project is proposed by City Ventures and would consist of the construction of 80 townhome style condominiums and up to 16 Americans with Disability Act (ADA) accessible accessory dwelling units (ADUs). The project description, and the potential environmental effects are discussed below, and the project site location is shown in Figure 1 and Figure 2 at the end of this notice.

PROJECT LOCATION

The project site is located at 1009-1011 Gravenstein Highway North, on the east side of Gravenstein Highway North southeast of its intersection with Mill Station Road, within the City of Sebastopol. The project site encompasses approximately 6.1 acres across two parcels. The project site consists of Assessor's Parcel Numbers (APNs) 060-261-028 and 060-261-026 and is adjacent to the City of Sebastopol's northwestern boundary. The project site is roughly bounded by a mix of Office buildings (O'Reilly Media Center) at 1003 Highway 116 North to the west, Gravenstein Highway North to the north, and primarily residential uses to the east and south.

PROJECT DESCRIPTION

The proposed project would involve the construction of 80 solar all-electric, three-story townhome-style condominiums, with the potential for up to 16 ADA ADUs. The project would require the City's approval of a conditional use permit for residential only within an Office Light Industrial zone, site development review, and vesting tentative tract map. In addition, the project applicant proposes the use of a State Density Bonus to allow for a waiver to increase the building height to three stories (6 ft above the max 30 ft height limit).

Access to the proposed residential units will be taken in from the newly created access from highway 116 north and includes existing entrances on Mill Station Road and the existing Office and Media buildings. The project would include a total of 160 parking spaces in garages and 58 surface spaces across the site. The project would include construction of landscaped internal walkways throughout the site, including a new, enhanced 6-foot-wide pedestrian pathway to connect the West County Trail to Gravenstein Highway along the northern border of the site; a bicycle repair station is proposed at the same location. The project would include 96 bicycle parking spaces, with 80 long-term spaces located in each residential garage and 16 spaces in onsite bicycle racks.

The proposed project would involve the removal of 21 trees (20 protected native trees including Oaks, Redwoods, Douglas Fir) while preserving the remaining 111 trees primarily along the perimeter of the site. An existing large, mature coast live oak tree would be retained at the northern primary entrance to the project entry. Proposed landscaping would include new plantings throughout the open spaces, along drive aisles, roadways, and streets, and surrounding the proposed buildings. Other amenities, including gardens, active and passive seating areas, children's play areas, and a meditation hammock garden are also proposed.

POTENTIAL ENVIRONMENTAL EFFECTS

Preliminary analysis indicates potential environmental effects related to aesthetics, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, population and housing, public services, transportation, tribal cultural resources, and utilities and service systems.

SCOPING MEETING

The City of Sebastopol, in its role as Lead Agency, will hold a public scoping meeting to provide an opportunity for the public and representatives of public agencies to provide input regarding the scope of the Environmental Impact Report. The Scoping Meeting is scheduled for **July 18th, 2023, 3:00 pm** on Zoom and at the Sebastopol Community Center at 425 Morris Street, Sebastopol, CA (Youth Annex Building). The link to the Zoom meeting is:

https://us02web.zoom.us/j/81841993599

PUBLIC REVIEW PERIOD

This NOP is available for public review and comment pursuant to California Code of Regulations, Title 14, Section 15082(b). The 30-day public comment period during which the City of Sebastopol will receive comments on the NOP for the EIR **begins July 6, 2023 and ends August 7, 2023.**

Members of the public and public agencies are invited to provide comments in writing as to the scope and content of the EIR. The City needs 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 may need to use the EIR prepared by the City when considering your permits or other approvals for the project.

Please send your comments to:

Planning Division
Attn: John Jay, Associate Planner
City of Sebastopol
7120 Bodega Avenue
Sebastopol, California, 95472

Or via email with “The Canopy Project NOP” as the subject to:
jjay@cityofsebastopol.org

Figure 1 Regional Location

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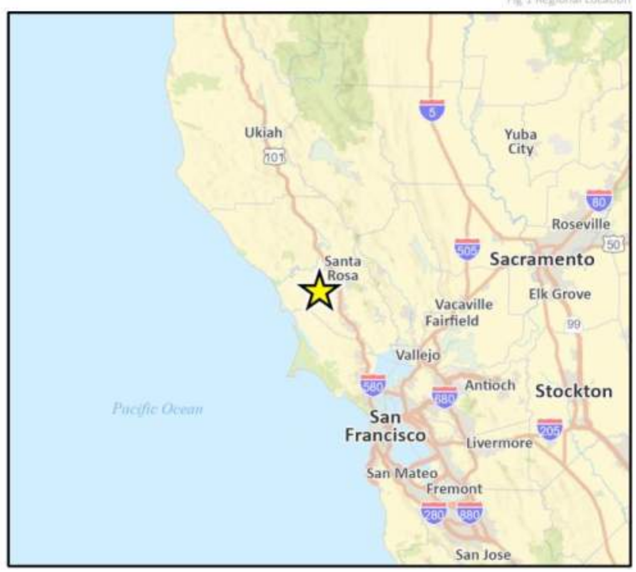
23-14227
Fig 1 Regional Location



☆ Project Location

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Figure 2 Project Site Location

Imagery provided by Microsoft Bing and its licensors © 2023; City of Sebastopol Geocortex Viewer, 2023.

23-14227
Fig 2 Project Location

Appendix B

Air Quality and Greenhouse Gas Emissions Calculations

The Canopy Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	The Canopy
Construction Start Date	6/1/2024
Operational Year	2027
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.20
Precipitation (days)	35.8
Location	1009 Gravenstein Hwy N, Sebastopol, CA 95472, USA
County	Sonoma-San Francisco
City	Sebastopol
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	996
EDFZ	2
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.19

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

Condo/Townhouse High Rise	80.0	Dwelling Unit	4.58	76,800	0.00	0.00	205	—
Parking Lot	58.0	Space	0.52	0.00	0.00	0.00	—	—
Apartments Low Rise	16.0	Dwelling Unit	1.00	4,800	0.00	0.00	41.0	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-5	Use Advanced Engine Tiers
Construction	C-10-A	Water Exposed Surfaces
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.66	27.1	30.5	0.06	1.14	8.97	10.1	1.05	3.74	4.77	—	6,815	6,815	0.29	0.17	6.53	6,876
Mit.	6.28	4.39	35.6	0.06	0.14	4.00	4.14	0.13	1.58	1.71	—	6,815	6,815	0.29	0.17	6.53	6,876
% Reduced	6%	84%	-17%	—	88%	55%	59%	87%	58%	64%	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	5.83	13.4	20.6	0.03	0.55	1.29	1.74	0.50	0.31	0.72	—	4,351	4,351	0.17	0.15	0.17	4,400
Mit.	5.81	3.77	23.1	0.03	0.09	1.29	1.38	0.09	0.31	0.39	—	4,351	4,351	0.17	0.15	0.17	4,400
% Reduced	< 0.5%	72%	-12%	—	84%	—	21%	83%	—	46%	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.89	13.3	17.6	0.03	0.52	2.53	3.05	0.48	0.91	1.39	—	4,244	4,244	0.19	0.13	2.23	4,290
Mit.	1.31	3.17	20.9	0.03	0.08	1.59	1.68	0.08	0.50	0.58	—	4,244	4,244	0.19	0.13	2.23	4,290
% Reduced	31%	76%	-18%	—	84%	37%	45%	83%	45%	58%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.34	2.42	3.22	0.01	0.09	0.46	0.56	0.09	0.17	0.25	—	703	703	0.03	0.02	0.37	710
Mit.	0.24	0.58	3.81	0.01	0.02	0.29	0.31	0.02	0.09	0.11	—	703	703	0.03	0.02	0.37	710
% Reduced	31%	76%	-18%	—	84%	37%	45%	83%	45%	58%	—	—	—	—	—	—	—

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	2.55	24.4	22.7	0.04	1.07	8.35	9.38	0.99	3.59	4.55	—	4,698	4,698	0.20	0.11	3.47	4,737
2025	3.17	27.1	30.5	0.06	1.14	8.97	10.1	1.05	3.74	4.77	—	6,815	6,815	0.29	0.17	6.53	6,876
2026	6.66	13.3	21.1	0.03	0.55	0.87	1.31	0.50	0.21	0.68	—	4,059	4,059	0.15	0.09	3.94	4,094
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.88	6.48	9.18	0.01	0.25	0.64	0.90	0.23	0.15	0.39	—	2,190	2,190	0.10	0.08	0.09	2,216

2025	1.67	12.0	17.8	0.03	0.45	1.29	1.74	0.42	0.31	0.72	—	4,351	4,351	0.17	0.15	0.17	4,400
2026	1.79	13.4	20.6	0.03	0.55	1.29	1.70	0.50	0.31	0.68	—	4,320	4,320	0.16	0.15	0.16	4,370
2027	5.83	7.34	11.9	0.02	0.31	0.23	0.43	0.28	0.05	0.31	—	1,848	1,848	0.07	0.02	0.02	1,856
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.74	6.69	6.99	0.01	0.28	1.81	2.09	0.26	0.75	1.00	—	1,543	1,543	0.07	0.04	0.49	1,556
2025	1.72	13.3	17.6	0.03	0.52	2.53	3.05	0.48	0.91	1.39	—	4,244	4,244	0.19	0.13	2.23	4,290
2026	1.89	8.31	12.8	0.02	0.32	0.78	1.09	0.29	0.19	0.47	—	2,958	2,958	0.11	0.09	1.60	2,991
2027	0.75	0.42	0.78	< 0.005	0.02	0.03	0.05	0.01	0.01	0.02	—	130	130	< 0.005	< 0.005	0.05	131
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.14	1.22	1.28	< 0.005	0.05	0.33	0.38	0.05	0.14	0.18	—	255	255	0.01	0.01	0.08	258
2025	0.31	2.42	3.22	0.01	0.09	0.46	0.56	0.09	0.17	0.25	—	703	703	0.03	0.02	0.37	710
2026	0.34	1.52	2.34	< 0.005	0.06	0.14	0.20	0.05	0.03	0.09	—	490	490	0.02	0.02	0.26	495
2027	0.14	0.08	0.14	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	21.6	21.6	< 0.005	< 0.005	0.01	21.7

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.50	2.92	24.7	0.04	0.09	3.38	3.47	0.09	1.43	1.52	—	4,698	4,698	0.20	0.11	3.47	4,737
2025	0.95	4.39	35.6	0.06	0.14	4.00	4.14	0.13	1.58	1.71	—	6,815	6,815	0.29	0.17	6.53	6,876
2026	6.28	3.67	23.5	0.03	0.08	0.87	0.94	0.07	0.21	0.27	—	4,059	4,059	0.15	0.09	3.94	4,094
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.47	1.76	10.8	0.01	0.04	0.64	0.69	0.04	0.15	0.20	—	2,190	2,190	0.10	0.08	0.09	2,216
2025	0.91	3.43	21.2	0.03	0.09	1.29	1.38	0.09	0.31	0.39	—	4,351	4,351	0.17	0.15	0.17	4,400

2026	0.88	3.77	23.1	0.03	0.09	1.29	1.38	0.08	0.31	0.39	—	4,320	4,320	0.16	0.15	0.16	4,370
2027	5.81	2.09	12.7	0.02	0.03	0.23	0.25	0.03	0.05	0.07	—	1,848	1,848	0.07	0.02	0.02	1,856
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.22	1.09	7.84	0.01	0.03	0.83	0.86	0.03	0.32	0.35	—	1,543	1,543	0.07	0.04	0.49	1,556
2025	0.78	3.17	20.9	0.03	0.08	1.59	1.68	0.08	0.50	0.58	—	4,244	4,244	0.19	0.13	2.23	4,290
2026	1.31	2.58	15.0	0.02	0.06	0.78	0.84	0.06	0.19	0.24	—	2,958	2,958	0.11	0.09	1.60	2,991
2027	0.73	0.29	0.83	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	130	130	< 0.005	< 0.005	0.05	131
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.04	0.20	1.43	< 0.005	0.01	0.15	0.16	0.01	0.06	0.06	—	255	255	0.01	0.01	0.08	258
2025	0.14	0.58	3.81	0.01	0.02	0.29	0.31	0.02	0.09	0.11	—	703	703	0.03	0.02	0.37	710
2026	0.24	0.47	2.74	< 0.005	0.01	0.14	0.15	0.01	0.03	0.04	—	490	490	0.02	0.02	0.26	495
2027	0.13	0.05	0.15	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	21.6	21.6	< 0.005	< 0.005	0.01	21.7

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.17	2.40	25.3	0.04	0.04	3.94	3.98	0.04	1.00	1.04	44.2	4,932	4,976	4.71	0.24	16.5	5,183
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.57	2.69	19.4	0.04	0.04	3.94	3.98	0.04	1.00	1.04	44.2	4,697	4,742	4.74	0.26	1.00	4,939
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.77	2.58	21.3	0.04	0.04	3.85	3.89	0.04	0.98	1.02	44.2	4,728	4,772	4.72	0.25	7.47	4,973

Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.87	0.47	3.89	0.01	0.01	0.70	0.71	0.01	0.18	0.19	7.32	783	790	0.78	0.04	1.24	823

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.80	2.34	19.9	0.04	0.04	3.94	3.98	0.04	1.00	1.04	—	4,536	4,536	0.21	0.22	15.9	4,623
Area	2.37	0.05	5.45	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	14.6	14.6	< 0.005	< 0.005	—	14.6
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	374	374	0.06	0.01	—	378
Water	—	—	—	—	—	—	—	—	—	—	5.93	7.70	13.6	0.61	0.01	—	33.2
Waste	—	—	—	—	—	—	—	—	—	—	38.3	0.00	38.3	3.83	0.00	—	134
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.58	0.58
Total	5.17	2.40	25.3	0.04	0.04	3.94	3.98	0.04	1.00	1.04	44.2	4,932	4,976	4.71	0.24	16.5	5,183
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.68	2.69	19.4	0.04	0.04	3.94	3.98	0.04	1.00	1.04	—	4,316	4,316	0.24	0.24	0.41	4,393
Area	1.89	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
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	374	374	0.06	0.01	—	378
Water	—	—	—	—	—	—	—	—	—	—	5.93	7.70	13.6	0.61	0.01	—	33.2
Waste	—	—	—	—	—	—	—	—	—	—	38.3	0.00	38.3	3.83	0.00	—	134
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.58	0.58
Total	4.57	2.69	19.4	0.04	0.04	3.94	3.98	0.04	1.00	1.04	44.2	4,697	4,742	4.74	0.26	1.00	4,939
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	2.65	2.56	18.6	0.04	0.04	3.85	3.89	0.04	0.98	1.02	—	4,339	4,339	0.23	0.23	6.89	4,421
Area	2.13	0.03	2.69	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	7.18	7.18	< 0.005	< 0.005	—	7.21
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	374	374	0.06	0.01	—	378
Water	—	—	—	—	—	—	—	—	—	—	5.93	7.70	13.6	0.61	0.01	—	33.2
Waste	—	—	—	—	—	—	—	—	—	—	38.3	0.00	38.3	3.83	0.00	—	134
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.58	0.58
Total	4.77	2.58	21.3	0.04	0.04	3.85	3.89	0.04	0.98	1.02	44.2	4,728	4,772	4.72	0.25	7.47	4,973
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.48	0.47	3.40	0.01	0.01	0.70	0.71	0.01	0.18	0.19	—	718	718	0.04	0.04	1.14	732
Area	0.39	< 0.005	0.49	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.19	1.19	< 0.005	< 0.005	—	1.19
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	61.9	61.9	0.01	< 0.005	—	62.5
Water	—	—	—	—	—	—	—	—	—	—	0.98	1.28	2.26	0.10	< 0.005	—	5.50
Waste	—	—	—	—	—	—	—	—	—	—	6.34	0.00	6.34	0.63	0.00	—	22.2
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.10	0.10
Total	0.87	0.47	3.89	0.01	0.01	0.70	0.71	0.01	0.18	0.19	7.32	783	790	0.78	0.04	1.24	823

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.80	2.34	19.9	0.04	0.04	3.94	3.98	0.04	1.00	1.04	—	4,536	4,536	0.21	0.22	15.9	4,623
Area	2.37	0.05	5.45	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	14.6	14.6	< 0.005	< 0.005	—	14.6
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	374	374	0.06	0.01	—	378
Water	—	—	—	—	—	—	—	—	—	—	5.93	7.70	13.6	0.61	0.01	—	33.2
Waste	—	—	—	—	—	—	—	—	—	—	38.3	0.00	38.3	3.83	0.00	—	134
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.58	0.58

Total	5.17	2.40	25.3	0.04	0.04	3.94	3.98	0.04	1.00	1.04	44.2	4,932	4,976	4.71	0.24	16.5	5,183
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.68	2.69	19.4	0.04	0.04	3.94	3.98	0.04	1.00	1.04	—	4,316	4,316	0.24	0.24	0.41	4,393
Area	1.89	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
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	374	374	0.06	0.01	—	378
Water	—	—	—	—	—	—	—	—	—	—	5.93	7.70	13.6	0.61	0.01	—	33.2
Waste	—	—	—	—	—	—	—	—	—	—	38.3	0.00	38.3	3.83	0.00	—	134
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.58	0.58
Total	4.57	2.69	19.4	0.04	0.04	3.94	3.98	0.04	1.00	1.04	44.2	4,697	4,742	4.74	0.26	1.00	4,939
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.65	2.56	18.6	0.04	0.04	3.85	3.89	0.04	0.98	1.02	—	4,339	4,339	0.23	0.23	6.89	4,421
Area	2.13	0.03	2.69	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	7.18	7.18	< 0.005	< 0.005	—	7.21
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	374	374	0.06	0.01	—	378
Water	—	—	—	—	—	—	—	—	—	—	5.93	7.70	13.6	0.61	0.01	—	33.2
Waste	—	—	—	—	—	—	—	—	—	—	38.3	0.00	38.3	3.83	0.00	—	134
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.58	0.58
Total	4.77	2.58	21.3	0.04	0.04	3.85	3.89	0.04	0.98	1.02	44.2	4,728	4,772	4.72	0.25	7.47	4,973
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.48	0.47	3.40	0.01	0.01	0.70	0.71	0.01	0.18	0.19	—	718	718	0.04	0.04	1.14	732
Area	0.39	< 0.005	0.49	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.19	1.19	< 0.005	< 0.005	—	1.19
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	61.9	61.9	0.01	< 0.005	—	62.5
Water	—	—	—	—	—	—	—	—	—	—	0.98	1.28	2.26	0.10	< 0.005	—	5.50
Waste	—	—	—	—	—	—	—	—	—	—	6.34	0.00	6.34	0.63	0.00	—	22.2
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.10	0.10
Total	0.87	0.47	3.89	0.01	0.01	0.70	0.71	0.01	0.18	0.19	7.32	783	790	0.78	0.04	1.24	823

3. Construction Emissions Details

3.1. Demolition - Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	1.93	2.70	< 0.005	0.06	—	0.06	0.05	—	0.05	—	438	438	0.02	< 0.005	—	440
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.25	0.35	< 0.005	0.01	—	0.01	0.01	—	0.01	—	57.6	57.6	< 0.005	< 0.005	—	57.8
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.05	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.54	9.54	< 0.005	< 0.005	—	9.57
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—

Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.26	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	44.4	44.4	< 0.005	< 0.005	0.20	45.2
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.48	5.48	< 0.005	< 0.005	0.01	5.57
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.91	0.91	< 0.005	< 0.005	< 0.005	0.92
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.2. Demolition - Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.05	0.83	3.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	438	438	0.02	< 0.005	—	440
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.11	0.40	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	57.6	57.6	< 0.005	< 0.005	—	57.8
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.02	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.54	9.54	< 0.005	< 0.005	—	9.57
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.26	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	44.4	44.4	< 0.005	< 0.005	0.20	45.2
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.48	5.48	< 0.005	< 0.005	0.01	5.57
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.91	0.91	< 0.005	< 0.005	< 0.005	0.92
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.3. Demolition - Phase 2 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	1.83	2.68	< 0.005	0.05	—	0.05	0.04	—	0.04	—	438	438	0.02	< 0.005	—	440
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	1.83	2.68	< 0.005	0.05	—	0.05	0.04	—	0.04	—	438	438	0.02	< 0.005	—	440

Demolitio	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.23	0.34	< 0.005	0.01	—	0.01	0.01	—	0.01	—	55.2	55.2	< 0.005	< 0.005	—	55.4
Demolitio n	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.04	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.14	9.14	< 0.005	< 0.005	—	9.17
Demolitio n	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.24	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	43.6	43.6	< 0.005	< 0.005	0.18	44.3
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.22	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	40.6	40.6	< 0.005	< 0.005	< 0.005	41.1
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.16	5.16	< 0.005	< 0.005	0.01	5.24
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.85	0.85	< 0.005	< 0.005	< 0.005	0.87
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.4. Demolition - Phase 2 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.83	3.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	438	438	0.02	< 0.005	—	440
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.83	3.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	438	438	0.02	< 0.005	—	440
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—

Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.11	0.39	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	55.2	55.2	< 0.005	< 0.005	—	55.4
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.02	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.14	9.14	< 0.005	< 0.005	—	9.17
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.24	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	43.6	43.6	< 0.005	< 0.005	0.18	44.3
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.22	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	40.6	40.6	< 0.005	< 0.005	< 0.005	41.1
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.16	5.16	< 0.005	< 0.005	0.01	5.24
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.85	0.85	< 0.005	< 0.005	< 0.005	0.87
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.5. Site Preparation- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.50	24.4	22.0	0.04	1.07	—	1.07	0.99	—	0.99	—	4,421	4,421	0.18	0.04	—	4,436
Dust From Material Movement	—	—	—	—	—	8.14	8.14	—	3.54	3.54	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	1.60	1.45	< 0.005	0.07	—	0.07	0.06	—	0.06	—	291	291	0.01	< 0.005	—	292

Dust From Material Movement	—	—	—	—	—	0.54	0.54	—	0.23	0.23	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.29	0.26	< 0.005	0.01	—	0.01	0.01	—	0.01	—	48.1	48.1	< 0.005	< 0.005	—	48.3
Dust From Material Movement	—	—	—	—	—	0.10	0.10	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.04	0.66	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	111	111	0.01	< 0.005	0.49	113
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.85	6.85	< 0.005	< 0.005	0.01	6.96
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.13	1.13	< 0.005	< 0.005	< 0.005	1.15
Vendor	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	0.00	0.00

Hauling	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	0.00	0.00

3.6. Site Preparation- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.42	2.17	24.1	0.04	0.08	—	0.08	0.08	—	0.08	—	4,421	4,421	0.18	0.04	—	4,436
Dust From Material Movement	—	—	—	—	—	3.18	3.18	—	1.38	1.38	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.14	1.58	< 0.005	0.01	—	0.01	0.01	—	0.01	—	291	291	0.01	< 0.005	—	292
Dust From Material Movement	—	—	—	—	—	0.21	0.21	—	0.09	0.09	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.03	0.29	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	48.1	48.1	< 0.005	< 0.005	—	48.3

Dust From Material Movement	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.04	0.66	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	111	111	0.01	< 0.005	0.49	113
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.85	6.85	< 0.005	< 0.005	0.01	6.96
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.13	1.13	< 0.005	< 0.005	< 0.005	1.15
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.7. Site Preparation - Phase 2 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.27	21.2	20.6	0.04	0.92	—	0.92	0.85	—	0.85	—	4,421	4,421	0.18	0.04	—	4,437
Dust From Material Movement	—	—	—	—	—	8.14	8.14	—	3.54	3.54	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.33	1.30	< 0.005	0.06	—	0.06	0.05	—	0.05	—	279	279	0.01	< 0.005	—	280
Dust From Material Movement	—	—	—	—	—	0.51	0.51	—	0.22	0.22	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.24	0.24	< 0.005	0.01	—	0.01	0.01	—	0.01	—	46.1	46.1	< 0.005	< 0.005	—	46.3
Dust From Material Movement	—	—	—	—	—	0.09	0.09	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.61	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	109	109	0.01	< 0.005	0.46	111
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.45	6.45	< 0.005	< 0.005	0.01	6.55
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.07	1.07	< 0.005	< 0.005	< 0.005	1.08
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.8. Site Preparation - Phase 2 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.42	2.17	24.1	0.04	0.08	—	0.08	0.08	—	0.08	—	4,421	4,421	0.18	0.04	—	4,437

Dust From Material Movement	—	—	—	—	—	3.18	3.18	—	1.38	1.38	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.14	1.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	279	279	0.01	< 0.005	—	280
Dust From Material Movement	—	—	—	—	—	0.20	0.20	—	0.09	0.09	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.02	0.28	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	46.1	46.1	< 0.005	< 0.005	—	46.3
Dust From Material Movement	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.61	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	109	109	0.01	< 0.005	0.46	111
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.45	6.45	< 0.005	< 0.005	0.01	6.55
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.07	1.07	< 0.005	< 0.005	< 0.005	1.08
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.9. Grading- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.41	23.4	20.3	0.04	1.03	—	1.03	0.95	—	0.95	—	4,165	4,165	0.17	0.03	—	4,179
Dust From Material Movement	—	—	—	—	—	8.15	8.15	—	3.54	3.54	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.32	3.08	2.67	0.01	0.14	—	0.14	0.12	—	0.12	—	548	548	0.02	< 0.005	—	550
Dust From Material Movement	—	—	—	—	—	1.07	1.07	—	0.47	0.47	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.56	0.49	< 0.005	0.02	—	0.02	0.02	—	0.02	—	90.7	90.7	< 0.005	< 0.005	—	91.0
Dust From Material Movement	—	—	—	—	—	0.20	0.20	—	0.08	0.08	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.04	0.66	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	111	111	0.01	< 0.005	0.49	113
Vendor	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	0.00	0.00
Hauling	0.01	0.60	0.23	< 0.005	< 0.005	0.10	0.10	< 0.005	0.03	0.03	—	423	423	0.03	0.07	0.86	445
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.7	13.7	< 0.005	< 0.005	0.03	13.9
Vendor	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	0.00	0.00

Hauling	< 0.005	0.08	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	55.6	55.6	< 0.005	0.01	0.05	58.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.27	2.27	< 0.005	< 0.005	< 0.005	2.31
Vendor	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	0.00	0.00
Hauling	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.21	9.21	< 0.005	< 0.005	0.01	9.68

3.10. Grading- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.42	2.28	22.2	0.04	0.09	—	0.09	0.09	—	0.09	—	4,165	4,165	0.17	0.03	—	4,179
Dust From Material Movement	—	—	—	—	—	3.18	3.18	—	1.38	1.38	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.30	2.92	0.01	0.01	—	0.01	0.01	—	0.01	—	548	548	0.02	< 0.005	—	550
Dust From Material Movement	—	—	—	—	—	0.42	0.42	—	0.18	0.18	—	—	—	—	—	—	—

Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.05	0.53	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	90.7	90.7	< 0.005	< 0.005	—	91.0
Dust From Material Movement	—	—	—	—	—	0.08	0.08	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.04	0.66	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	111	111	0.01	< 0.005	0.49	113
Vendor	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	0.00	0.00
Hauling	0.01	0.60	0.23	< 0.005	< 0.005	0.10	0.10	< 0.005	0.03	0.03	—	423	423	0.03	0.07	0.86	445
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.7	13.7	< 0.005	< 0.005	0.03	13.9
Vendor	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	0.00	0.00
Hauling	< 0.005	0.08	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	55.6	55.6	< 0.005	0.01	0.05	58.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.27	2.27	< 0.005	< 0.005	< 0.005	2.31
Vendor	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	0.00	0.00
Hauling	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.21	9.21	< 0.005	< 0.005	0.01	9.68

3.11. Grading - Phase 2 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.20	20.3	18.9	0.04	0.89	—	0.89	0.82	—	0.82	—	4,165	4,165	0.17	0.03	—	4,180
Dust From Material Movement	—	—	—	—	—	8.14	8.14	—	3.54	3.54	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.28	2.56	2.39	< 0.005	0.11	—	0.11	0.10	—	0.10	—	525	525	0.02	< 0.005	—	527
Dust From Material Movement	—	—	—	—	—	1.03	1.03	—	0.45	0.45	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.47	0.44	< 0.005	0.02	—	0.02	0.02	—	0.02	—	86.9	86.9	< 0.005	< 0.005	—	87.2

Dust From Material Movement	—	—	—	—	—	0.19	0.19	—	0.08	0.08	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.61	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	109	109	0.01	< 0.005	0.46	111
Vendor	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	0.00	0.00
Hauling	0.01	0.45	0.18	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	324	324	0.02	0.05	0.66	341
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.9	12.9	< 0.005	< 0.005	0.02	13.1
Vendor	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	0.00	0.00
Hauling	< 0.005	0.06	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	40.9	40.9	< 0.005	0.01	0.04	42.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.13	2.13	< 0.005	< 0.005	< 0.005	2.17
Vendor	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	0.00	0.00
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.77	6.77	< 0.005	< 0.005	0.01	7.11

3.12. Grading - Phase 2 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.42	2.28	22.2	0.04	0.09	—	0.09	0.09	—	0.09	—	4,165	4,165	0.17	0.03	—	4,180
Dust From Material Movement	—	—	—	—	—	3.18	3.18	—	1.38	1.38	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.29	2.80	< 0.005	0.01	—	0.01	0.01	—	0.01	—	525	525	0.02	< 0.005	—	527
Dust From Material Movement	—	—	—	—	—	0.40	0.40	—	0.17	0.17	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.05	0.51	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	86.9	86.9	< 0.005	< 0.005	—	87.2
Dust From Material Movement	—	—	—	—	—	0.07	0.07	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.61	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	109	109	0.01	< 0.005	0.46	111
Vendor	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	0.00	0.00
Hauling	0.01	0.45	0.18	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	324	324	0.02	0.05	0.66	341
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.9	12.9	< 0.005	< 0.005	0.02	13.1
Vendor	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	0.00	0.00
Hauling	< 0.005	0.06	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	40.9	40.9	< 0.005	0.01	0.04	42.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.13	2.13	< 0.005	< 0.005	< 0.005	2.17
Vendor	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	0.00	0.00
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	6.77	6.77	< 0.005	< 0.005	0.01	7.11

3.13. Building Construction- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.59	5.76	5.80	0.01	0.25	—	0.25	0.23	—	0.23	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.59	5.76	5.80	0.01	0.25	—	0.25	0.23	—	0.23	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	1.48	1.49	< 0.005	0.06	—	0.06	0.06	—	0.06	—	342	342	0.01	< 0.005	—	344
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.27	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	56.7	56.7	< 0.005	< 0.005	—	56.9
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.31	0.23	3.63	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	614	614	0.03	0.02	2.73	624
Vendor	0.01	0.40	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	289	289	0.01	0.04	0.74	303
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.30	3.21	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	572	572	0.04	0.02	0.07	580
Vendor	0.01	0.42	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	289	289	0.01	0.04	0.02	302
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.07	0.07	0.80	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	148	148	0.01	0.01	0.30	151
Vendor	< 0.005	0.11	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	74.4	74.4	< 0.005	0.01	0.08	77.9
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.15	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	24.6	24.6	< 0.005	< 0.005	0.05	25.0
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.3	12.3	< 0.005	< 0.005	0.01	12.9
Hauling	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	0.00	0.00

3.14. Building Construction- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	1.04	7.44	0.01	0.04	—	0.04	0.04	—	0.04	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	1.04	7.44	0.01	0.04	—	0.04	0.04	—	0.04	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.27	1.92	< 0.005	0.01	—	0.01	0.01	—	0.01	—	342	342	0.01	< 0.005	—	344

Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.05	0.35	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	56.7	56.7	< 0.005	< 0.005	—	56.9
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.31	0.23	3.63	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	614	614	0.03	0.02	2.73	624
Vendor	0.01	0.40	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	289	289	0.01	0.04	0.74	303
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.30	3.21	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	572	572	0.04	0.02	0.07	580
Vendor	0.01	0.42	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	289	289	0.01	0.04	0.02	302
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.80	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	148	148	0.01	0.01	0.30	151
Vendor	< 0.005	0.11	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	74.4	74.4	< 0.005	0.01	0.08	77.9
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.15	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	24.6	24.6	< 0.005	< 0.005	0.05	25.0
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.3	12.3	< 0.005	< 0.005	0.01	12.9
Hauling	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	0.00	0.00

3.15. Building Construction- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	5.32	5.76	0.01	0.22	—	0.22	0.20	—	0.20	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	5.32	5.76	0.01	0.22	—	0.22	0.20	—	0.20	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	5.32	5.76	0.01	0.22	—	0.22	0.20	—	0.20	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.97	1.05	< 0.005	0.04	—	0.04	0.04	—	0.04	—	220	220	0.01	< 0.005	—	221
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.21	3.38	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	602	602	0.03	0.02	2.53	613
Vendor	0.01	0.38	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	285	285	0.01	0.04	0.73	298
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.28	3.00	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	561	561	0.02	0.02	0.07	569
Vendor	0.01	0.40	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	285	285	0.01	0.04	0.02	297
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.25	2.91	0.00	0.00	0.56	0.56	0.00	0.13	0.13	—	566	566	0.03	0.02	1.09	575
Vendor	0.01	0.39	0.16	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	285	285	0.01	0.04	0.32	298
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.53	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	93.6	93.6	0.01	< 0.005	0.18	95.1
Vendor	< 0.005	0.07	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	47.1	47.1	< 0.005	0.01	0.05	49.3
Hauling	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	0.00	0.00

3.16. Building Construction- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.18	1.04	7.44	0.01	0.04	—	0.04	0.04	—	0.04	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	1.04	7.44	0.01	0.04	—	0.04	0.04	—	0.04	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	1.04	7.44	0.01	0.04	—	0.04	0.04	—	0.04	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.19	1.36	< 0.005	0.01	—	0.01	0.01	—	0.01	—	220	220	0.01	< 0.005	—	221
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.21	3.38	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	602	602	0.03	0.02	2.53	613
Vendor	0.01	0.38	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	285	285	0.01	0.04	0.73	298
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.28	3.00	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	561	561	0.02	0.02	0.07	569

Vendor	0.01	0.40	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	285	285	0.01	0.04	0.02	297
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.25	2.91	0.00	0.00	0.56	0.56	0.00	0.13	0.13	—	566	566	0.03	0.02	1.09	575
Vendor	0.01	0.39	0.16	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	285	285	0.01	0.04	0.32	298
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.53	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	93.6	93.6	0.01	< 0.005	0.18	95.1
Vendor	< 0.005	0.07	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	47.1	47.1	< 0.005	0.01	0.05	49.3
Hauling	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	0.00	0.00

3.17. Building Construction- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.54	5.01	5.72	0.01	0.20	—	0.20	0.19	—	0.19	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.19	1.36	< 0.005	0.05	—	0.05	0.04	—	0.04	—	317	317	0.01	< 0.005	—	318

Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.22	0.25	< 0.005	0.01	—	0.01	0.01	—	0.01	—	52.5	52.5	< 0.005	< 0.005	—	52.6
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.26	2.80	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	551	551	0.02	0.02	0.06	559
Vendor	0.01	0.38	0.15	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	280	280	0.01	0.04	0.02	292
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.65	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	132	132	< 0.005	0.01	0.24	134
Vendor	< 0.005	0.09	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	66.7	66.7	< 0.005	0.01	0.07	69.8
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.12	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	21.9	21.9	< 0.005	< 0.005	0.04	22.3
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	11.0	11.0	< 0.005	< 0.005	0.01	11.6
Hauling	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	0.00	0.00

3.18. Building Construction- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	1.04	7.44	0.01	0.04	—	0.04	0.04	—	0.04	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.25	1.77	< 0.005	0.01	—	0.01	0.01	—	0.01	—	317	317	0.01	< 0.005	—	318
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.05	0.32	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	52.5	52.5	< 0.005	< 0.005	—	52.6
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.26	2.80	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	551	551	0.02	0.02	0.06	559
Vendor	0.01	0.38	0.15	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	280	280	0.01	0.04	0.02	292
Hauling	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	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.65	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	132	132	< 0.005	0.01	0.24	134
Vendor	< 0.005	0.09	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	66.7	66.7	< 0.005	0.01	0.07	69.8
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.12	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	21.9	21.9	< 0.005	< 0.005	0.04	22.3
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	11.0	11.0	< 0.005	< 0.005	0.01	11.6
Hauling	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	0.00	0.00

3.19. Building Construction - Phase 2 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	5.32	5.76	0.01	0.22	—	0.22	0.20	—	0.20	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.56	5.32	5.76	0.01	0.22	—	0.22	0.20	—	0.20	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.29	2.78	3.02	0.01	0.12	—	0.12	0.11	—	0.11	—	696	696	0.03	0.01	—	698
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.51	0.55	< 0.005	0.02	—	0.02	0.02	—	0.02	—	115	115	< 0.005	< 0.005	—	116
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.21	3.38	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	602	602	0.03	0.02	2.53	613
Vendor	0.01	0.38	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	285	285	0.01	0.04	0.73	298
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.28	3.00	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	561	561	0.02	0.02	0.07	569
Vendor	0.01	0.40	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	285	285	0.01	0.04	0.02	297
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.13	1.53	0.00	0.00	0.29	0.29	0.00	0.07	0.07	—	296	296	0.02	0.01	0.57	301
Vendor	< 0.005	0.21	0.08	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	149	149	0.01	0.02	0.17	156
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.02	0.28	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	49.0	49.0	< 0.005	< 0.005	0.09	49.8
Vendor	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	24.7	24.7	< 0.005	< 0.005	0.03	25.8
Hauling	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	0.00	0.00

3.20. Building Construction - Phase 2 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	1.04	7.44	0.01	0.04	—	0.04	0.04	—	0.04	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	1.04	7.44	0.01	0.04	—	0.04	0.04	—	0.04	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.55	3.89	0.01	0.02	—	0.02	0.02	—	0.02	—	696	696	0.03	0.01	—	698
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.10	0.71	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	115	115	< 0.005	< 0.005	—	116
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.21	3.38	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	602	602	0.03	0.02	2.53	613
Vendor	0.01	0.38	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	285	285	0.01	0.04	0.73	298
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.28	3.00	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	561	561	0.02	0.02	0.07	569
Vendor	0.01	0.40	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	285	285	0.01	0.04	0.02	297
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.13	1.53	0.00	0.00	0.29	0.29	0.00	0.07	0.07	—	296	296	0.02	0.01	0.57	301
Vendor	< 0.005	0.21	0.08	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	149	149	0.01	0.02	0.17	156
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.02	0.28	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	49.0	49.0	< 0.005	< 0.005	0.09	49.8
Vendor	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	24.7	24.7	< 0.005	< 0.005	0.03	25.8
Hauling	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	0.00	0.00

3.21. Building Construction - Phase 2 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.54	5.01	5.72	0.01	0.20	—	0.20	0.19	—	0.19	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.54	5.01	5.72	0.01	0.20	—	0.20	0.19	—	0.19	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.49	4.57	5.21	0.01	0.18	—	0.18	0.17	—	0.17	—	1,213	1,213	0.05	0.01	—	1,217
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.83	0.95	< 0.005	0.03	—	0.03	0.03	—	0.03	—	201	201	0.01	< 0.005	—	201
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.19	3.17	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	591	591	0.01	0.02	2.33	601
Vendor	0.01	0.36	0.15	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	280	280	0.01	0.04	0.68	293
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.26	2.80	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	551	551	0.02	0.02	0.06	559

Vendor	0.01	0.38	0.15	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	280	280	0.01	0.04	0.02	292
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.21	2.49	0.00	0.00	0.51	0.51	0.00	0.12	0.12	—	507	507	0.01	0.02	0.92	514
Vendor	0.01	0.34	0.14	< 0.005	< 0.005	0.06	0.07	< 0.005	0.02	0.02	—	255	255	0.01	0.04	0.27	267
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.45	0.00	0.00	0.09	0.09	0.00	0.02	0.02	—	83.9	83.9	< 0.005	< 0.005	0.15	85.2
Vendor	< 0.005	0.06	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	42.3	42.3	< 0.005	0.01	0.04	44.2
Hauling	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	0.00	0.00

3.22. Building Construction - Phase 2 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	1.04	7.44	0.01	0.04	—	0.04	0.04	—	0.04	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	1.04	7.44	0.01	0.04	—	0.04	0.04	—	0.04	—	1,329	1,329	0.05	0.01	—	1,334
Onsite truck	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	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	0.95	6.78	0.01	0.04	—	0.04	0.04	—	0.04	—	1,213	1,213	0.05	0.01	—	1,217
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.17	1.24	< 0.005	0.01	—	0.01	0.01	—	0.01	—	201	201	0.01	< 0.005	—	201
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.19	3.17	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	591	591	0.01	0.02	2.33	601
Vendor	0.01	0.36	0.15	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	280	280	0.01	0.04	0.68	293
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.26	2.80	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	551	551	0.02	0.02	0.06	559
Vendor	0.01	0.38	0.15	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	280	280	0.01	0.04	0.02	292
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.21	2.49	0.00	0.00	0.51	0.51	0.00	0.12	0.12	—	507	507	0.01	0.02	0.92	514
Vendor	0.01	0.34	0.14	< 0.005	< 0.005	0.06	0.07	< 0.005	0.02	0.02	—	255	255	0.01	0.04	0.27	267
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.45	0.00	0.00	0.09	0.09	0.00	0.02	0.02	—	83.9	83.9	< 0.005	< 0.005	0.15	85.2

Vendor	< 0.005	0.06	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	42.3	42.3	< 0.005	0.01	0.04	44.2
Hauling	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	0.00	0.00

3.23. Paving- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	7.68	11.3	0.02	0.34	—	0.34	0.31	—	0.31	—	1,730	1,730	0.07	0.01	—	1,736
Paving	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	7.68	11.3	0.02	0.34	—	0.34	0.31	—	0.31	—	1,730	1,730	0.07	0.01	—	1,736
Paving	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.99	1.46	< 0.005	0.04	—	0.04	0.04	—	0.04	—	223	223	0.01	< 0.005	—	224
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.02	0.18	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	36.9	36.9	< 0.005	< 0.005	—	37.0
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.04	0.69	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	128	128	< 0.005	< 0.005	0.51	130
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.61	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	120	120	< 0.005	0.01	0.01	121
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.5	15.5	< 0.005	< 0.005	0.03	15.8
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.57	2.57	< 0.005	< 0.005	< 0.005	2.61
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.24. Paving- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	2.04	12.1	0.02	0.03	—	0.03	0.03	—	0.03	—	1,730	1,730	0.07	0.01	—	1,736
Paving	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	2.04	12.1	0.02	0.03	—	0.03	0.03	—	0.03	—	1,730	1,730	0.07	0.01	—	1,736
Paving	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.26	1.56	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	223	223	0.01	< 0.005	—	224
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.05	0.28	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	36.9	36.9	< 0.005	< 0.005	—	37.0
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.04	0.69	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	128	128	< 0.005	< 0.005	0.51	130
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.61	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	120	120	< 0.005	0.01	0.01	121
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.5	15.5	< 0.005	< 0.005	0.03	15.8
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.57	2.57	< 0.005	< 0.005	< 0.005	2.61
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.25. Paving - Phase 2 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	7.68	11.3	0.02	0.34	—	0.34	0.31	—	0.31	—	1,730	1,730	0.07	0.01	—	1,736
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.67	1.00	< 0.005	0.03	—	0.03	0.03	—	0.03	—	152	152	0.01	< 0.005	—	152
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.12	0.18	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	25.1	25.1	< 0.005	< 0.005	—	25.2
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.61	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	120	120	< 0.005	0.01	0.01	121
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.6	10.6	< 0.005	< 0.005	0.02	10.7
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.75	1.75	< 0.005	< 0.005	< 0.005	1.78
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.26. Paving - Phase 2 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	2.04	12.1	0.02	0.03	—	0.03	0.03	—	0.03	—	1,730	1,730	0.07	0.01	—	1,736
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.18	1.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	152	152	0.01	< 0.005	—	152
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.03	0.19	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	25.1	25.1	< 0.005	< 0.005	—	25.2
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.61	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	120	120	< 0.005	0.01	0.01	121
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.6	10.6	< 0.005	< 0.005	0.02	10.7
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.75	1.75	< 0.005	< 0.005	< 0.005	1.78
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.27. Paving - Phase 2 (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.87	7.29	11.4	0.02	0.31	—	0.31	0.28	—	0.28	—	1,731	1,731	0.07	0.01	—	1,737

Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.26	0.41	< 0.005	0.01	—	0.01	0.01	—	0.01	—	61.6	61.6	< 0.005	< 0.005	—	61.9
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.05	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.2	10.2	< 0.005	< 0.005	—	10.2
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.57	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	117	117	< 0.005	0.01	0.01	119
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.22	4.22	< 0.005	< 0.005	0.01	4.28
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.70	0.70	< 0.005	< 0.005	< 0.005	0.71
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.28. Paving - Phase 2 (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	2.04	12.1	0.02	0.03	—	0.03	0.03	—	0.03	—	1,731	1,731	0.07	0.01	—	1,737
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.07	0.43	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	61.6	61.6	< 0.005	< 0.005	—	61.9
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.2	10.2	< 0.005	< 0.005	—	10.2
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.05	0.05	0.57	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	117	117	< 0.005	0.01	0.01	119
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.22	4.22	< 0.005	< 0.005	0.01	4.28
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.70	0.70	< 0.005	< 0.005	< 0.005	0.71
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.29. Architectural Coating- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	1.25	1.82	< 0.005	0.04	—	0.04	0.04	—	0.04	—	301	301	0.01	< 0.005	—	302
Architectural Coatings	5.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.16	0.23	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	38.8	38.8	< 0.005	< 0.005	—	38.9
Architectural Coatings	0.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.42	6.42	< 0.005	< 0.005	—	6.44
Architectural Coatings	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.08	1.27	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	236	236	< 0.005	0.01	0.93	240
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.14	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	28.6	28.6	< 0.005	< 0.005	0.05	29.0
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.74	4.74	< 0.005	< 0.005	0.01	4.81
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.30. Architectural Coating- Phase 1 (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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	1.68	2.04	< 0.005	0.02	—	0.02	0.02	—	0.02	—	301	301	0.01	< 0.005	—	302
Architectural Coatings	5.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.22	0.26	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	38.8	38.8	< 0.005	< 0.005	—	38.9
Architectural Coatings	0.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.42	6.42	< 0.005	< 0.005	—	6.44
Architectural Coatings	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.08	1.27	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	236	236	< 0.005	0.01	0.93	240
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.14	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	28.6	28.6	< 0.005	< 0.005	0.05	29.0
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.74	4.74	< 0.005	< 0.005	0.01	4.81
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.31. Architectural Coating - Phase 2 (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	1.23	1.82	< 0.005	0.04	—	0.04	0.03	—	0.03	—	301	301	0.01	< 0.005	—	302
Architectural Coatings	5.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.15	0.22	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	37.1	37.1	< 0.005	< 0.005	—	37.3
Architectural Coatings	0.69	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.15	6.15	< 0.005	< 0.005	—	6.17
Architectural Coatings	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.10	1.06	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	219	219	0.01	0.01	0.02	222
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.13	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	27.2	27.2	< 0.005	< 0.005	0.05	27.7
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.51	4.51	< 0.005	< 0.005	0.01	4.58
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

3.32. Architectural Coating - Phase 2 (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	1.68	2.04	< 0.005	0.02	—	0.02	0.02	—	0.02	—	301	301	0.01	< 0.005	—	302
Architectural Coatings	5.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.21	0.25	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	37.1	37.1	< 0.005	< 0.005	—	37.3
Architectural Coatings	0.69	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.15	6.15	< 0.005	< 0.005	—	6.17
Architectural Coatings	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.10	1.06	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	219	219	0.01	0.01	0.02	222
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.13	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	27.2	27.2	< 0.005	< 0.005	0.05	27.7
Vendor	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	0.00	0.00

Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.51	4.51	< 0.005	< 0.005	0.01	4.58
Vendor	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	0.00	0.00
Hauling	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	0.00	0.00

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	2.36	1.97	16.7	0.04	0.03	3.32	3.35	0.03	0.84	0.88	—	3,819	3,819	0.18	0.19	13.4	3,892
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	0.00	0.00
Apartments Low Rise	0.44	0.37	3.14	0.01	0.01	0.62	0.63	0.01	0.16	0.16	—	717	717	0.03	0.03	2.52	731
Total	2.80	2.34	19.9	0.04	0.04	3.94	3.98	0.04	1.00	1.04	—	4,536	4,536	0.21	0.22	15.9	4,623
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	2.25	2.27	16.4	0.04	0.03	3.32	3.35	0.03	0.84	0.88	—	3,633	3,633	0.20	0.20	0.35	3,699

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	0.00	0.00
Apartments Low Rise	0.42	0.43	3.07	0.01	0.01	0.62	0.63	0.01	0.16	0.16	—	682	682	0.04	0.04	0.07	695
Total	2.68	2.69	19.4	0.04	0.04	3.94	3.98	0.04	1.00	1.04	—	4,316	4,316	0.24	0.24	0.41	4,393
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	0.41	0.39	2.86	0.01	0.01	0.59	0.60	0.01	0.15	0.16	—	605	605	0.03	0.03	0.96	616
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	0.00	0.00
Apartments Low Rise	0.08	0.07	0.54	< 0.005	< 0.005	0.11	0.11	< 0.005	0.03	0.03	—	114	114	0.01	0.01	0.18	116
Total	0.48	0.47	3.40	0.01	0.01	0.70	0.71	0.01	0.18	0.19	—	718	718	0.04	0.04	1.14	732

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	2.36	1.97	16.7	0.04	0.03	3.32	3.35	0.03	0.84	0.88	—	3,819	3,819	0.18	0.19	13.4	3,892
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	0.00	0.00
Apartments Low Rise	0.44	0.37	3.14	0.01	0.01	0.62	0.63	0.01	0.16	0.16	—	717	717	0.03	0.03	2.52	731
Total	2.80	2.34	19.9	0.04	0.04	3.94	3.98	0.04	1.00	1.04	—	4,536	4,536	0.21	0.22	15.9	4,623

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	2.25	2.27	16.4	0.04	0.03	3.32	3.35	0.03	0.84	0.88	—	3,633	3,633	0.20	0.20	0.35	3,699
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	0.00	0.00
Apartments Low Rise	0.42	0.43	3.07	0.01	0.01	0.62	0.63	0.01	0.16	0.16	—	682	682	0.04	0.04	0.07	695
Total	2.68	2.69	19.4	0.04	0.04	3.94	3.98	0.04	1.00	1.04	—	4,316	4,316	0.24	0.24	0.41	4,393
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	0.41	0.39	2.86	0.01	0.01	0.59	0.60	0.01	0.15	0.16	—	605	605	0.03	0.03	0.96	616
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	0.00	0.00
Apartments Low Rise	0.08	0.07	0.54	< 0.005	< 0.005	0.11	0.11	< 0.005	0.03	0.03	—	114	114	0.01	0.01	0.18	116
Total	0.48	0.47	3.40	0.01	0.01	0.70	0.71	0.01	0.18	0.19	—	718	718	0.04	0.04	1.14	732

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	—	290	290	0.05	0.01	—	293
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	11.1	11.1	< 0.005	< 0.005	—	11.2
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	72.9	72.9	0.01	< 0.005	—	73.6
Total	—	—	—	—	—	—	—	—	—	—	—	374	374	0.06	0.01	—	378
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	—	290	290	0.05	0.01	—	293
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	11.1	11.1	< 0.005	< 0.005	—	11.2
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	72.9	72.9	0.01	< 0.005	—	73.6
Total	—	—	—	—	—	—	—	—	—	—	—	374	374	0.06	0.01	—	378
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	—	48.0	48.0	0.01	< 0.005	—	48.5
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	1.84	1.84	< 0.005	< 0.005	—	1.86
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	12.1	12.1	< 0.005	< 0.005	—	12.2
Total	—	—	—	—	—	—	—	—	—	—	—	61.9	61.9	0.01	< 0.005	—	62.5

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	—	290	290	0.05	0.01	—	293
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	11.1	11.1	< 0.005	< 0.005	—	11.2
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	72.9	72.9	0.01	< 0.005	—	73.6
Total	—	—	—	—	—	—	—	—	—	—	—	374	374	0.06	0.01	—	378
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	—	290	290	0.05	0.01	—	293
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	11.1	11.1	< 0.005	< 0.005	—	11.2
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	72.9	72.9	0.01	< 0.005	—	73.6
Total	—	—	—	—	—	—	—	—	—	—	—	374	374	0.06	0.01	—	378
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	—	48.0	48.0	0.01	< 0.005	—	48.5
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	1.84	1.84	< 0.005	< 0.005	—	1.86
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	12.1	12.1	< 0.005	< 0.005	—	12.2

Total	—	—	—	—	—	—	—	—	—	—	—	61.9	61.9	0.01	< 0.005	—	62.5

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	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
Apartments Low Rise	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	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	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
Apartments Low Rise	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	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	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
Apartments Low Rise	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	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	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
Apartments Low Rise	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	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	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
Apartments Low Rise	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	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	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
Apartments Low Rise	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	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	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	0.00	—	0.00
Consumer Products	1.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.48	0.05	5.45	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	14.6	14.6	< 0.005	< 0.005	—	14.6
Total	2.37	0.05	5.45	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	14.6	14.6	< 0.005	< 0.005	—	14.6

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	0.00	—	0.00
Consumer Products	1.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	1.89	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
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	0.00	—	0.00
Consumer Products	0.32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.04	< 0.005	0.49	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.19	1.19	< 0.005	< 0.005	—	1.19
Total	0.39	< 0.005	0.49	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.19	1.19	< 0.005	< 0.005	—	1.19

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	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	0.00	—	0.00

Consumer	1.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.48	0.05	5.45	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	14.6	14.6	< 0.005	< 0.005	—	14.6
Total	2.37	0.05	5.45	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	14.6	14.6	< 0.005	< 0.005	—	14.6
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	0.00	—	0.00
Consumer Products	1.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	1.89	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
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	0.00	—	0.00
Consumer Products	0.32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.04	< 0.005	0.49	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.19	1.19	< 0.005	< 0.005	—	1.19
Total	0.39	< 0.005	0.49	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.19	1.19	< 0.005	< 0.005	—	1.19

4.4. Water Emissions by Land Use

4.4.1. 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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	4.94	6.42	11.4	0.51	0.01	—	27.7
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	0.99	1.28	2.27	0.10	< 0.005	—	5.54
Total	—	—	—	—	—	—	—	—	—	—	5.93	7.70	13.6	0.61	0.01	—	33.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	4.94	6.42	11.4	0.51	0.01	—	27.7
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	0.99	1.28	2.27	0.10	< 0.005	—	5.54
Total	—	—	—	—	—	—	—	—	—	—	5.93	7.70	13.6	0.61	0.01	—	33.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	0.82	1.06	1.88	0.08	< 0.005	—	4.58

Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	0.16	0.21	0.38	0.02	< 0.005	—	0.92
Total	—	—	—	—	—	—	—	—	—	—	0.98	1.28	2.26	0.10	< 0.005	—	5.50

4.4.2. 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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	4.94	6.42	11.4	0.51	0.01	—	27.7
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	0.99	1.28	2.27	0.10	< 0.005	—	5.54
Total	—	—	—	—	—	—	—	—	—	—	5.93	7.70	13.6	0.61	0.01	—	33.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	4.94	6.42	11.4	0.51	0.01	—	27.7
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	0.99	1.28	2.27	0.10	< 0.005	—	5.54
Total	—	—	—	—	—	—	—	—	—	—	5.93	7.70	13.6	0.61	0.01	—	33.2

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	0.82	1.06	1.88	0.08	< 0.005	—	4.58
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	0.16	0.21	0.38	0.02	< 0.005	—	0.92
Total	—	—	—	—	—	—	—	—	—	—	0.98	1.28	2.26	0.10	< 0.005	—	5.50

4.5. Waste Emissions by Land Use

4.5.1. 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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	31.9	0.00	31.9	3.19	0.00	—	112
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	6.38	0.00	6.38	0.64	0.00	—	22.3
Total	—	—	—	—	—	—	—	—	—	—	38.3	0.00	38.3	3.83	0.00	—	134
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	31.9	0.00	31.9	3.19	0.00	—	112
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	6.38	0.00	6.38	0.64	0.00	—	22.3
Total	—	—	—	—	—	—	—	—	—	—	38.3	0.00	38.3	3.83	0.00	—	134
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	5.28	0.00	5.28	0.53	0.00	—	18.5
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	1.06	0.00	1.06	0.11	0.00	—	3.70
Total	—	—	—	—	—	—	—	—	—	—	6.34	0.00	6.34	0.63	0.00	—	22.2

4.5.2. 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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	31.9	0.00	31.9	3.19	0.00	—	112
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	6.38	0.00	6.38	0.64	0.00	—	22.3

Total	—	—	—	—	—	—	—	—	—	—	38.3	0.00	38.3	3.83	0.00	—	134
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	31.9	0.00	31.9	3.19	0.00	—	112
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	6.38	0.00	6.38	0.64	0.00	—	22.3
Total	—	—	—	—	—	—	—	—	—	—	38.3	0.00	38.3	3.83	0.00	—	134
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	5.28	0.00	5.28	0.53	0.00	—	18.5
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	1.06	0.00	1.06	0.11	0.00	—	3.70
Total	—	—	—	—	—	—	—	—	—	—	6.34	0.00	6.34	0.63	0.00	—	22.2

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.55	0.55
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.03	0.03
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.58	0.58
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.55	0.55
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.03	0.03
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.58	0.58
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.09	0.09
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.10	0.10

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	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.55	0.55

Apartmen Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.03	0.03
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.58	0.58
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/To wnhouse High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.55	0.55
Apartmen ts Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.03	0.03
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.58	0.58
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condo/To wnhouse High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.09	0.09
Apartmen ts Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.10	0.10

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)

Equipme nt Type	ROG	NOx	CO	SO2	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	CO	SO2	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	CO	SO2	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	CO	SO2	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)

Equipme Type	ROG	NOx	CO	SO2	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)

Equipme nt Type	ROG	NOx	CO	SO2	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	CO	SO2	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	CO	SO2	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	CO	SO2	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	CO	SO2	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	CO	SO2	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	CO	SO2	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

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition - Phase 1	Demolition	6/1/2024	7/18/2024	7.00	48.0	—
Demolition - Phase 2	Demolition	3/1/2025	4/15/2025	7.00	46.0	—
Site Preparation- Phase 1	Site Preparation	7/19/2024	8/11/2024	7.00	24.0	—
Site Preparation - Phase 2	Site Preparation	4/16/2025	5/8/2025	7.00	23.0	—
Grading- Phase 1	Grading	8/12/2024	9/28/2024	7.00	48.0	—
Grading - Phase 2	Grading	5/9/2025	6/23/2025	7.00	46.0	—
Building Construction- Phase 1	Building Construction	9/29/2024	3/28/2026	7.00	546	—
Building Construction - Phase 2	Building Construction	6/24/2025	11/29/2026	7.00	524	—
Paving- Phase 1	Paving	3/29/2026	5/14/2026	7.00	47.0	—
Paving - Phase 2	Paving	11/30/2026	1/13/2027	7.00	45.0	—
Architectural Coating- Phase 1	Architectural Coating	5/15/2026	6/30/2026	7.00	47.0	—
Architectural Coating - Phase 2	Architectural Coating	1/14/2027	2/27/2027	7.00	45.0	—

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 - Phase 1	Aerial Lifts	Diesel	Average	1.00	8.00	46.0	0.31
Demolition - Phase 1	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Demolition - Phase 2	Aerial Lifts	Diesel	Average	1.00	8.00	46.0	0.31
Demolition - Phase 2	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Site Preparation- Phase 1	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Site Preparation- Phase 1	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Site Preparation- Phase 1	Scrapers	Diesel	Average	1.00	8.00	423	0.48
Site Preparation- Phase 1	Graders	Diesel	Average	1.00	8.00	148	0.41
Site Preparation - Phase 2	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Site Preparation - Phase 2	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Site Preparation - Phase 2	Graders	Diesel	Average	1.00	8.00	148	0.41
Site Preparation - Phase 2	Scrapers	Diesel	Average	1.00	8.00	423	0.48
Grading- Phase 1	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading- Phase 1	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Grading- Phase 1	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading- Phase 1	Plate Compactors	Diesel	Average	1.00	8.00	8.00	0.43

Grading- Phase 1	Scrapers	Diesel	Average	1.00	8.00	423	0.48
Grading - Phase 2	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading - Phase 2	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Grading - Phase 2	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading - Phase 2	Plate Compactors	Diesel	Average	1.00	8.00	8.00	0.43
Grading - Phase 2	Scrapers	Diesel	Average	1.00	8.00	423	0.48
Building Construction- Phase 1	Forklifts	Diesel	Average	1.00	8.00	82.0	0.20
Building Construction- Phase 1	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction- Phase 1	Tractors/Loaders/Backhoes	Diesel	Average	1.00	7.00	84.0	0.37
Building Construction- Phase 1	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
Building Construction - Phase 2	Forklifts	Diesel	Average	1.00	8.00	82.0	0.20
Building Construction - Phase 2	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction - Phase 2	Tractors/Loaders/Backhoes	Diesel	Average	1.00	7.00	84.0	0.37
Building Construction - Phase 2	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
Paving- Phase 1	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Paving- Phase 1	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Paving- Phase 1	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Paving- Phase 1	Graders	Diesel	Average	1.00	8.00	148	0.41
Paving - Phase 2	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Paving - Phase 2	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Paving - Phase 2	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37

Paving - Phase 2	Graders	Diesel	Average	1.00	8.00	148	0.41
Architectural Coating- Phase 1	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
Architectural Coating- Phase 1	Skid Steer Loaders	Diesel	Average	1.00	8.00	71.0	0.37
Architectural Coating - Phase 2	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
Architectural Coating - Phase 2	Skid Steer Loaders	Diesel	Average	1.00	8.00	71.0	0.37

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition - Phase 1	Aerial Lifts	Diesel	Tier 4 Final	1.00	8.00	46.0	0.31
Demolition - Phase 1	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	8.00	84.0	0.37
Demolition - Phase 2	Aerial Lifts	Diesel	Tier 4 Final	1.00	8.00	46.0	0.31
Demolition - Phase 2	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	8.00	84.0	0.37
Site Preparation- Phase 1	Rubber Tired Dozers	Diesel	Tier 4 Final	1.00	8.00	367	0.40
Site Preparation- Phase 1	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37
Site Preparation- Phase 1	Scrapers	Diesel	Tier 4 Final	1.00	8.00	423	0.48
Site Preparation- Phase 1	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41
Site Preparation - Phase 2	Rubber Tired Dozers	Diesel	Tier 4 Final	1.00	8.00	367	0.40
Site Preparation - Phase 2	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37
Site Preparation - Phase 2	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41

Site Preparation - Phase 2	Scrapers	Diesel	Tier 4 Final	1.00	8.00	423	0.48
Grading- Phase 1	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41
Grading- Phase 1	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	8.00	84.0	0.37
Grading- Phase 1	Rubber Tired Dozers	Diesel	Tier 4 Final	1.00	8.00	367	0.40
Grading- Phase 1	Plate Compactors	Diesel	Average	1.00	8.00	8.00	0.43
Grading- Phase 1	Scrapers	Diesel	Tier 4 Final	1.00	8.00	423	0.48
Grading - Phase 2	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41
Grading - Phase 2	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	8.00	84.0	0.37
Grading - Phase 2	Rubber Tired Dozers	Diesel	Tier 4 Final	1.00	8.00	367	0.40
Grading - Phase 2	Plate Compactors	Diesel	Average	1.00	8.00	8.00	0.43
Grading - Phase 2	Scrapers	Diesel	Tier 4 Final	1.00	8.00	423	0.48
Building Construction- Phase 1	Forklifts	Diesel	Tier 4 Final	1.00	8.00	82.0	0.20
Building Construction- Phase 1	Cranes	Diesel	Tier 4 Final	1.00	7.00	367	0.29
Building Construction- Phase 1	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	7.00	84.0	0.37
Building Construction- Phase 1	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
Building Construction - Phase 2	Forklifts	Diesel	Tier 4 Final	1.00	8.00	82.0	0.20
Building Construction - Phase 2	Cranes	Diesel	Tier 4 Final	1.00	7.00	367	0.29
Building Construction - Phase 2	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	7.00	84.0	0.37
Building Construction - Phase 2	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
Paving- Phase 1	Paving Equipment	Diesel	Tier 4 Final	1.00	8.00	89.0	0.36
Paving- Phase 1	Rollers	Diesel	Tier 4 Final	2.00	8.00	36.0	0.38

Paving- Phase 1	Tractors/Loaders/Backh	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37
Paving- Phase 1	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41
Paving - Phase 2	Paving Equipment	Diesel	Tier 4 Final	1.00	8.00	89.0	0.36
Paving - Phase 2	Rollers	Diesel	Tier 4 Final	2.00	8.00	36.0	0.38
Paving - Phase 2	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37
Paving - Phase 2	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41
Architectural Coating- Phase 1	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
Architectural Coating- Phase 1	Skid Steer Loaders	Diesel	Tier 4 Final	1.00	8.00	71.0	0.37
Architectural Coating - Phase 2	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
Architectural Coating - Phase 2	Skid Steer Loaders	Diesel	Tier 4 Final	1.00	8.00	71.0	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 - Phase 1	—	—	—	—
Demolition - Phase 1	Worker	5.00	11.7	LDA,LDT1,LDT2
Demolition - Phase 1	Vendor	—	8.40	HHDT,MHDT
Demolition - Phase 1	Hauling	0.00	20.0	HHDT
Demolition - Phase 1	Onsite truck	—	—	HHDT
Site Preparation- Phase 1	—	—	—	—
Site Preparation- Phase 1	Worker	12.5	11.7	LDA,LDT1,LDT2
Site Preparation- Phase 1	Vendor	—	8.40	HHDT,MHDT
Site Preparation- Phase 1	Hauling	0.00	20.0	HHDT

Site Preparation- Phase 1	Onsite truck	—	—	HHDT
Grading- Phase 1	—	—	—	—
Grading- Phase 1	Worker	12.5	11.7	LDA,LDT1,LDT2
Grading- Phase 1	Vendor	—	8.40	HHDT,MHDT
Grading- Phase 1	Hauling	5.46	20.0	HHDT
Grading- Phase 1	Onsite truck	—	—	HHDT
Building Construction- Phase 1	—	—	—	—
Building Construction- Phase 1	Worker	69.1	11.7	LDA,LDT1,LDT2
Building Construction- Phase 1	Vendor	10.3	8.40	HHDT,MHDT
Building Construction- Phase 1	Hauling	0.00	20.0	HHDT
Building Construction- Phase 1	Onsite truck	—	—	HHDT
Paving- Phase 1	—	—	—	—
Paving- Phase 1	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving- Phase 1	Vendor	—	8.40	HHDT,MHDT
Paving- Phase 1	Hauling	0.00	20.0	HHDT
Paving- Phase 1	Onsite truck	—	—	HHDT
Architectural Coating- Phase 1	—	—	—	—
Architectural Coating- Phase 1	Worker	27.6	11.7	LDA,LDT1,LDT2
Architectural Coating- Phase 1	Vendor	—	8.40	HHDT,MHDT
Architectural Coating- Phase 1	Hauling	0.00	20.0	HHDT
Architectural Coating- Phase 1	Onsite truck	—	—	HHDT
Demolition - Phase 2	—	—	—	—
Demolition - Phase 2	Worker	5.00	11.7	LDA,LDT1,LDT2
Demolition - Phase 2	Vendor	—	8.40	HHDT,MHDT
Demolition - Phase 2	Hauling	0.00	20.0	HHDT
Demolition - Phase 2	Onsite truck	—	—	HHDT
Site Preparation - Phase 2	—	—	—	—

Site Preparation - Phase 2	Worker	12.5	11.7	LDA,LDT1,LDT2
Site Preparation - Phase 2	Vendor	—	8.40	HHDT,MHDT
Site Preparation - Phase 2	Hauling	0.00	20.0	HHDT
Site Preparation - Phase 2	Onsite truck	—	—	HHDT
Grading - Phase 2	—	—	—	—
Grading - Phase 2	Worker	12.5	11.7	LDA,LDT1,LDT2
Grading - Phase 2	Vendor	—	8.40	HHDT,MHDT
Grading - Phase 2	Hauling	4.26	20.0	HHDT
Grading - Phase 2	Onsite truck	—	—	HHDT
Building Construction - Phase 2	—	—	—	—
Building Construction - Phase 2	Worker	69.1	11.7	LDA,LDT1,LDT2
Building Construction - Phase 2	Vendor	10.3	8.40	HHDT,MHDT
Building Construction - Phase 2	Hauling	0.00	20.0	HHDT
Building Construction - Phase 2	Onsite truck	—	—	HHDT
Paving - Phase 2	—	—	—	—
Paving - Phase 2	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving - Phase 2	Vendor	—	8.40	HHDT,MHDT
Paving - Phase 2	Hauling	0.00	20.0	HHDT
Paving - Phase 2	Onsite truck	—	—	HHDT
Architectural Coating - Phase 2	—	—	—	—
Architectural Coating - Phase 2	Worker	28.0	11.7	LDA,LDT1,LDT2
Architectural Coating - Phase 2	Vendor	—	8.40	HHDT,MHDT
Architectural Coating - Phase 2	Hauling	0.00	20.0	HHDT
Architectural Coating - Phase 2	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix

Demolition - Phase 1	—	—	—	—
Demolition - Phase 1	Worker	5.00	11.7	LDA,LDT1,LDT2
Demolition - Phase 1	Vendor	—	8.40	HHDT,MHDT
Demolition - Phase 1	Hauling	0.00	20.0	HHDT
Demolition - Phase 1	Onsite truck	—	—	HHDT
Site Preparation- Phase 1	—	—	—	—
Site Preparation- Phase 1	Worker	12.5	11.7	LDA,LDT1,LDT2
Site Preparation- Phase 1	Vendor	—	8.40	HHDT,MHDT
Site Preparation- Phase 1	Hauling	0.00	20.0	HHDT
Site Preparation- Phase 1	Onsite truck	—	—	HHDT
Grading- Phase 1	—	—	—	—
Grading- Phase 1	Worker	12.5	11.7	LDA,LDT1,LDT2
Grading- Phase 1	Vendor	—	8.40	HHDT,MHDT
Grading- Phase 1	Hauling	5.46	20.0	HHDT
Grading- Phase 1	Onsite truck	—	—	HHDT
Building Construction- Phase 1	—	—	—	—
Building Construction- Phase 1	Worker	69.1	11.7	LDA,LDT1,LDT2
Building Construction- Phase 1	Vendor	10.3	8.40	HHDT,MHDT
Building Construction- Phase 1	Hauling	0.00	20.0	HHDT
Building Construction- Phase 1	Onsite truck	—	—	HHDT
Paving- Phase 1	—	—	—	—
Paving- Phase 1	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving- Phase 1	Vendor	—	8.40	HHDT,MHDT
Paving- Phase 1	Hauling	0.00	20.0	HHDT
Paving- Phase 1	Onsite truck	—	—	HHDT
Architectural Coating- Phase 1	—	—	—	—
Architectural Coating- Phase 1	Worker	27.6	11.7	LDA,LDT1,LDT2

Architectural Coating- Phase 1	Vendor	—	8.40	HHDT,MHDT
Architectural Coating- Phase 1	Hauling	0.00	20.0	HHDT
Architectural Coating- Phase 1	Onsite truck	—	—	HHDT
Demolition - Phase 2	—	—	—	—
Demolition - Phase 2	Worker	5.00	11.7	LDA,LDT1,LDT2
Demolition - Phase 2	Vendor	—	8.40	HHDT,MHDT
Demolition - Phase 2	Hauling	0.00	20.0	HHDT
Demolition - Phase 2	Onsite truck	—	—	HHDT
Site Preparation - Phase 2	—	—	—	—
Site Preparation - Phase 2	Worker	12.5	11.7	LDA,LDT1,LDT2
Site Preparation - Phase 2	Vendor	—	8.40	HHDT,MHDT
Site Preparation - Phase 2	Hauling	0.00	20.0	HHDT
Site Preparation - Phase 2	Onsite truck	—	—	HHDT
Grading - Phase 2	—	—	—	—
Grading - Phase 2	Worker	12.5	11.7	LDA,LDT1,LDT2
Grading - Phase 2	Vendor	—	8.40	HHDT,MHDT
Grading - Phase 2	Hauling	4.26	20.0	HHDT
Grading - Phase 2	Onsite truck	—	—	HHDT
Building Construction - Phase 2	—	—	—	—
Building Construction - Phase 2	Worker	69.1	11.7	LDA,LDT1,LDT2
Building Construction - Phase 2	Vendor	10.3	8.40	HHDT,MHDT
Building Construction - Phase 2	Hauling	0.00	20.0	HHDT
Building Construction - Phase 2	Onsite truck	—	—	HHDT
Paving - Phase 2	—	—	—	—
Paving - Phase 2	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving - Phase 2	Vendor	—	8.40	HHDT,MHDT
Paving - Phase 2	Hauling	0.00	20.0	HHDT

Paving - Phase 2	Onsite truck	—	—	HHDT
Architectural Coating - Phase 2	—	—	—	—
Architectural Coating - Phase 2	Worker	28.0	11.7	LDA,LDT1,LDT2
Architectural Coating - Phase 2	Vendor	—	8.40	HHDT,MHDT
Architectural Coating - Phase 2	Hauling	0.00	20.0	HHDT
Architectural Coating - Phase 2	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

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)
Architectural Coating- Phase 1	84,456	28,152	0.00	0.00	697
Architectural Coating - Phase 2	80,784	26,928	0.00	0.00	667

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 (sq. ft.)	Acres Paved (acres)
Demolition - Phase 1	0.00	0.00	0.00	—	—
Demolition - Phase 2	0.00	0.00	0.00	—	—
Site Preparation- Phase 1	0.00	0.00	48.0	0.00	—
Site Preparation - Phase 2	0.00	0.00	46.0	0.00	—
Grading- Phase 1	2,092	0.00	96.0	0.00	—
Grading - Phase 2	0.00	1,566	92.0	0.00	—

Paving- Phase 1	0.00	0.00	0.00	0.00	0.52
Paving - Phase 2	0.00	0.00	0.00	0.00	0.52

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Condo/Townhouse High Rise	—	0%
Parking Lot	0.52	100%
Apartments Low Rise	—	0%

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
2027	0.00	204	0.03	< 0.005

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
Condo/Townhouse High Rise	576	576	576	210,240	4,649	4,649	4,649	1,696,962
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Apartments Low Rise	108	108	108	39,478	873	873	873	318,652

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Condo/Townhouse High Rise	576	576	576	210,240	4,649	4,649	4,649	1,696,962
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Apartments Low Rise	108	108	108	39,478	873	873	873	318,652

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Condo/Townhouse High Rise	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	80
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0
Apartments Low Rise	—

Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	16
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)
Condo/Townhouse High Rise	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	80
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0
Apartments Low Rise	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0

No Fireplaces	16
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)
165240	55,080	0.00	0.00	1,364

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 CO_2 and CH_4 and N_2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Condo/Townhouse High Rise	518,756	204	0.0330	0.0040	0.00

Parking Lot	19,919	204	0.0330	0.0040	0.00
Apartments Low Rise	130,471	204	0.0330	0.0040	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)
Condo/Townhouse High Rise	518,756	204	0.0330	0.0040	0.00
Parking Lot	19,919	204	0.0330	0.0040	0.00
Apartments Low Rise	130,471	204	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Condo/Townhouse High Rise	2,578,944	0.00
Parking Lot	0.00	0.00
Apartments Low Rise	515,789	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Condo/Townhouse High Rise	2,578,944	0.00
Parking Lot	0.00	0.00
Apartments Low Rise	515,789	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Condo/Townhouse High Rise	59.2	—
Parking Lot	0.00	—
Apartments Low Rise	11.8	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Condo/Townhouse High Rise	59.2	—
Parking Lot	0.00	—
Apartments Low Rise	11.8	—

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
Condo/Townhouse High Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Condo/Townhouse High Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Apartments Low Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments Low Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	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

Condo/Townhouse High Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Condo/Townhouse High Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Apartments Low Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments Low Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	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	8.86	annual days of extreme heat
Extreme Precipitation	18.6	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	4.51	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	5	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	5	1	1	4
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	6.38
AQ-PM	5.09
AQ-DPM	32.7
Drinking Water	59.7
Lead Risk Housing	50.0
Pesticides	78.9
Toxic Releases	0.95
Traffic	35.2
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	84.3
Haz Waste Facilities/Generators	16.6
Impaired Water Bodies	58.7
Solid Waste	70.4
Sensitive Population	—
Asthma	31.1
Cardio-vascular	20.6
Low Birth Weights	20.9
Socioeconomic Factor Indicators	—
Education	22.2
Housing	63.3
Linguistic	3.74
Poverty	30.8
Unemployment	77.1

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	60.25920698
Employed	89.43924034
Median HI	61.32426537
Education	—
Bachelor's or higher	75.15719235
High school enrollment	11.8311305
Preschool enrollment	46.13114333
Transportation	—
Auto Access	76.73553189
Active commuting	78.09572693
Social	—
2-parent households	31.79776723
Voting	98.54998075
Neighborhood	—
Alcohol availability	24.08571795
Park access	49.53163095
Retail density	40.95983575
Supermarket access	72.92441935
Tree canopy	94.23841909
Housing	—
Homeownership	45.09174901
Housing habitability	55.54985243
Low-inc homeowner severe housing cost burden	60.70832799

Low-inc renter severe housing cost burden	21.80161684
Uncrowded housing	96.93314513
Health Outcomes	—
Insured adults	64.54510458
Arthritis	0.0
Asthma ER Admissions	61.3
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	66.1
Cognitively Disabled	35.0
Physically Disabled	54.0
Heart Attack ER Admissions	80.5
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	64.9
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	87.0
Elderly	16.8
English Speaking	65.2
Foreign-born	14.4
Outdoor Workers	64.4
Climate Change Adaptive Capacity	—
Impervious Surface Cover	86.7
Traffic Density	36.3
Traffic Access	23.0
Other Indices	—
Hardship	26.5
Other Decision Support	—
2016 Voting	98.9

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	26.0
Healthy Places Index Score for Project Location (b)	74.0
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	Sum of project site is 6.1 acres. Each ADU is approximately 300 square feet
Construction: Construction Phases	Phase 1: June 2024 to June 2026 and Phase 2: March 2025 to February 2027.
Construction: Off-Road Equipment	Based on applicant provided information
Operations: Vehicle Data	Based on TIS provided by W-Trans. 684 daily vehicle trips
Operations: Hearths	No fireplaces based on applicant provided information
Operations: Architectural Coatings	Based on BAAQMD Regulation 8 Rule 3
Construction: Architectural Coatings	Based on BAAQMD Regulation 8 Rule 3
Operations: Energy Use	The project would not include natural gas. Converted naturgal gas assumptions to electricity

Appendix C

Biological Resources Analysis

Biological Resource Analysis

“The Canopy”

Sebastopol, Sonoma County, California

Prepared for
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Prepared by

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433 Visitacion Avenue
Brisbane, CA 94005

July 2023

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ACRONYMS AND ABBREVIATIONS

AMSL	above mean sea level
BMP	best management practice
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
DPS	Distinct Population Segment
FESA	Federal Endangered Species Act
LID	Low Impact Development
MBTA	Migratory Bird Treaty Act
MND	Mitigated Negative Declaration
MS4s	municipal separate storm sewer systems
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
PBF	physical or biological features
Porter Cologne	Porter Cologne Water Quality Control Act
quad	quadrangle
Regional Water Board	Regional Water Quality Control Board
SWRCB	California State Water Resources Control Board
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDR	waste discharge requirements
WOTUS	waters of the U.S./State

1 INTRODUCTION

1.1 PURPOSE OF THE DOCUMENT

The City of Sebastopol is requiring a Biological Resource Analysis for the construction of an approximately 6.1-acre medium-density residential development (”The Canopy” [the Project]) within the City of Sebastopol, in accordance with the requirements of the California Environmental Quality Act (CEQA) (California Public Resources Code, Division 13, Section 2100 et seq.) and CEQA Guidelines (Title 14, California Code of Regulations, Chapter 3, Section 15000 et seq.). The City of Sebastopol is the CEQA Lead Agency for the Project.

The purpose of this Biological Resource Analysis is to gather information necessary to complete a review of biological resources and potential Project effects to those resources under CEQA. The analysis herein considers the Project location in conjunction with proposed work activities to analyze potential Project-related impacts on the natural environment.

1.2 PROJECT LOCATION

The 6.1-acre Gravenstein Highway Residential Project site (Project site) is located at 1003-1011 Gravenstein Highway North in Sebastopol, Sonoma County, California (Figure 1. Project Site and Vicinity Map). The site is composed of two parcels: Assessor’s Parcel Numbers 060-261-028 and 060-261-026. For the purposes of this BRA, the Project site assessed herein includes the approximately 6.1-acre Project Site is located on the northern boundary of the City of Sebastopol, Sonoma County, California (the approximate center of the Project Site is at 38°41'17.26"N, 122°84'03.34"W). The Project Site is located east of the intersection of Mill Station Road and the Gravenstein Highway. The Project Site is bound to the north by a public trail, existing residential development, and a charter school, to the south by existing residential development and an existing commercial development (including buildings and parking lots), and to the east by Hurlburt Avenue, and to the west by Gravenstein Highway.

2 PROPOSED PROJECT

2.1 PROJECT OVERVIEW

The proposed Project includes the construction of an approximately 6.1-acre residential development, with 80 townhome style condominiums, and associated infrastructure, utilities, an access road, a play area, and landscaping, as well as a 6' wide pedestrian pathway to connect the Joe Rodota Trail to Gravenstein Highway on the southern border of the site. Project implementation would include the, mass grading of the entire Project site (with the exception of locations where trees are to be protected in-place which includes the area roughly within the dripline of the trees), and construction of project components.

The Project would be constructed using typical site grading, site improvement, and Type 'V' wood-framed construction techniques per the California Building Code requirements. Project implementation would require the use of water trucks, scrapers, compactors, bulldozers, caterpillars, back-hoes, augers, concrete trucks, and assorted other hand tools and professional grade equipment.

Pending Project approval, grading is anticipated to commence in mid-2024 with Project completion proposed for late-2025. Crews typically would work during daylight hours and consistently with the City of Sebastopol's ordinances for construction. These dates and times are subject to change, pending issuance of project permits and agency authorizations.

2.2 SIGNIFICANCE THRESHOLDS FOR PROJECT IMPACTS

Potential impacts associated with implementation of the Project are addressed in the following sections. In accordance with Appendix G of the State CEQA Guidelines, Project-related impacts would be considered significant if the Project would result in one or more of the following effects:

a. 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 CDFW or USFWS; or

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS; or

c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means; or

d. 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; or

e. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

3 CURRENT CONDITION OF NATURAL ENVIRONMENT

3.1 PERSONNEL AND SURVEY DATES

3.1.1 General Site Survey

Integral Consulting Inc personnel Cameron Johnson conducted a general site survey of the Project site on May 21, 2021, to record biological resources and to assess the likelihood of resource agency regulated areas on the Project site. Sadie McGarvey and Luke Davies conducted an updated survey of the Project site on July 18, 2023, to document current site conditions. These surveys involved searching all habitats on the site and recording all plant and wildlife species observed, cross-referencing the onsite habitats against the habitat requirements of regionally known special-status species to determine suitability of the Project site to support such species.

3.2 LIMITATIONS AND ASSUMPTIONS THAT MAY INFLUENCE RESULTS

All necessary portions of the Project site were accessible to the surveying biologists. protocol rare-plant surveys have not been completed. Wildlife species, however, may be cryptic, generally difficult to detect, transient, nocturnal, or migratory species that may only occur within the Project site for short or fleeting time periods. Wildlife species may only be active during particular times of the year, such as the breeding season, or may only use the Project site temporarily. For these reasons, plant and wildlife species may be present but not observed. This limitation may influence the study results.

3.3 EXISTING CONDITIONS

The Project Site overall is relatively flat with a gentle western-facing slope, with elevations ranging from approximately 200 feet above mean sea level (AMSL) at the eastern border to approximately 190 feet AMSL at the northwestern corner of the site. The Project Site consists of a remnant apple orchard that is interspersed with native trees including coast live oak (*Quercus agrifolia*), Douglas fir (*Pseudotsuga menziesii*), valley oak (*Quercus lobata*), and Coast redwood (*Sequoia sempervirens*).

The southeastern portion of the Project site was formerly occupied by a community garden, however, at the time the July 2023 survey, the garden boxes had been removed and the site was dominated by ruderal vegetation. Ruderal vegetation is characterized by species that colonize and thrive in disturbed areas, collectively referred to as ruderal species. These species may be native or non-native, but are often thought of as “weedy” species. Dominant species included non-native herbaceous species such as bristly ox-tongue (*Helminthotheca* *echioides*), French broom (*Genista monspessulana*), wild radish (*Raphanus sativus*), and hairy cat's-ear (*Hypochaeris radicata*). Lesser dominants include non-native grasses such as slender wild oats (*Avena barbata*), rip-gut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), and foxtail barley (*Hordeum murinum*).

Overall, the Project site is highly disturbed and actively managed. At the time of the site visit, the orchard portions of the site had been recently disced and there was minimal herbaceous vegetation present, and the ruderal portion of the site had been recently mowed and there was evidence of significant weedy herbaceous vegetation present on the site prior to mowing. The edges of the Project Site are dominated by dense Himalayan blackberry (Rubus armeniacus) thickets and ruderal vegetation, in areas where the equipment could not access. A list of all observed onsite plant species is included in Table 1.

3.3.1 Soils

According to the Natural Resource Conservation Service, two soil units, or types, have been mapped on the Project Site (NRCS 2021): Goldridge fine sandy loam, 2 to 9 Percent Slopes, representing approximately 21% of the on-site soils, and Sebastopol sandy loam, 2 to 9% slopes, representing approximately 79% of the onsite soils. Goldridge fine sandy loam is listed as a hydric soil on the California Hydric Soils List for Sonoma County; Sebastapol sandy loam is not a listed hydric soil.

4 POTENTIAL IMPACTS TO SPECIAL-STATUS SPECIES

4.1 APPLICABLE LAWS

Special-status species include species considered to be rare by federal and/or state resource agencies (USFWS, National Marine Fisheries Service (NMFS), CDFW) and/or the scientific community (CNPS) and are accordingly legally protected pursuant to the federal, state, and/or local laws described below in addition to CEQA.

4.1.1 Endangered Species Act of 1973

The Endangered Species Act of 1973 (referred to as the Federal Endangered Species Act [FESA]) prohibits the "take" of any wildlife species listed by the USFWS or NMFS (collectively referred to as the Services) as threatened or endangered, including the destruction of habitat that could hinder species recovery. The term "take" is defined by FESA as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct, with habitat protected under the "harm" and "harass" definitions. The USFWS and NMFS oversee the implementation of FESA (50 Code of Federal Regulations (CFR) § 402.7, Section 305(b)(4)(B)) and have regulatory authority over listed plants, wildlife, and fish. When species are listed as endangered or threatened under FESA, the federal government is also directed to designate critical habitat for these species. To remain compliant with the FESA, federal agencies, such as USACE, are required to consult with the resource agencies prior to issuance of a permit if a project may adversely affect a federally listed species. If USACE is able to determine the project would have no effect on a listed species (when there is no potential for presence of a listed species), no additional consultation is required.

The USFWS and NMFS administer the FESA and authorize exceptions to the take provisions through issuance of Biological Opinions in consultation with the federal action agency (e.g., USACE or the Federal Emergency Management Agency). The USFWS has primary responsibility for terrestrial and freshwater organisms, whereas the responsibilities of the NMFS are mainly marine wildlife, such as whales, and anadromous fish, such as salmon.

4.1.2 Migratory Bird Treaty Act (MBTA)

The MBTA of 1918 (16 United States Code (U.S.C.) 703-712; Ch. 128; July 13, 1918; 40 Stat. 755; as amended in 1936; 1960, 1968, 1969, 1974, 1978, 1986, and 1998) (between the United States, Canada, Mexico, and Japan) prohibits the take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct) of any migratory bird or any part, nest, or egg of any such bird. The USFWS issues permits for take of migratory birds related to scientific collecting, banding and marking, falconry, raptor propagation, depredation, import, export, taxidermy, waterfowl sale and disposal, and special purposes.

4.1.3 California Endangered Species Act (CESA)

The CESA prohibits the "take" of any wildlife species listed as endangered and threatened by the State of California. The term "take" is defined by Fish and Game Code Section 86 as hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill. Section 2090 of the CESA requires state agencies to comply with regulations for protection and recovery of listed species and to promote conservation of these species. CDFW administers the CESA and authorizes exceptions to the take provisions through Section 2081 agreements (Incidental Take Permits) (except for designated "fully protected species"). Regarding rare plant species, the CESA defers to the California Native Plant Protection Act of 1977. Species that the California Fish and Game Commission has noticed as being under review for listing by CDFW are likewise given full CESA protection.

4.1.4 California Native Plant Protection Act and California Fish and Game Code (Plants)

The CNPS designates California Rare Plants through a ranking system. Ranks 1A, 1B, and 2 meet the definitions established in Section 1901, Chapter 10 (Native Plant Protection Act of 1977) or Sections 2062 and 2067 of the CESA and are eligible for state listing. Some Rank 3 and 4 plants may fall under Section 15380 of the CEQA Guidelines.

4.1.5 California Fish and Game Code (Fully Protected Species)

The State of California designated 37 species of wildlife that were rare or faced possible extinction with the classification of Fully Protected in the 1960s to provide additional protection to those species. To provide additional protections for wildlife that is rare or faces potential extinction, California Fish and Game Code Sections 3511, 4700, 5050, and 5515 designate "fully protected" status for specific birds, mammals, reptiles, amphibians, and fish. Fully protected species cannot be taken or possessed at any time and no licenses or permits can be issued for their take. Exceptions are established for scientific research collection, relocation of the bird species for the protection of livestock, and take resulting from recovery activities for state-listed species.

4.1.6 California Fish and Game Code (Birds)

California Fish and Game Code Section 3503 prohibits the take of nest or eggs of any bird. Raptors and other fully protected bird species are further protected in Sections 3503.5 and 3511, which state that these species or parts thereof may not be taken or possessed at any time.

4.1.7 CDFW Species of Special Concern

A species of special concern is an administrative designation given by CDFW to a native species that meets one or more of the following criteria: is extirpated from the state; is federally (but not state) listed; is experiencing, or formerly experienced, population declines or range restrictions; or has naturally small populations at high risk of declines. While this designation carries no legal status, CEQA Guidelines Section 15380 clearly indicates that species of special concern should be included in an analysis of project impacts.

4.2 METHODOLOGY

Information about special status species that could occur on the Project site was obtained from the following sources:

- CNDDB RareFind 5 (CDFW 2021; CDFW 2023)
- CNPS Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2023)
- Existing literature as cited in the text

The CNDDB was used to query all special-status species with known occurrences within 3 miles of the Project site. A query of the CNPS Inventory of Rare, Threatened, and Endangered Plants of California was conducted for state and federally listed and candidate species, as well as CNPS-ranked species known to occur within the same U.S. Geological Survey 7.5-Minute quadrangle (quad) as the Project site (Sebastopol quad) and/or one or more of the 8 quads surrounding the Project site, to determine additional special-status plants with potential to occur on the Project site.

The species identified in these searches were compiled in tables (Appendix A) and evaluated for likelihood of occurrence on the Project site. The potential for species to be adversely affected by the Project was classified as high, moderate, low, or none using the following definitions:

- **High:** The potential for a species to occur was considered high when the Project site was located within the range of the species, recorded observations were identified within known dispersal distance of the Project site, and suitable habitat was present on the Project site.
- **Moderate:** The potential for a species to occur was considered moderate when the Project site was located within the range of the species, recorded observations were identified nearby but outside known dispersal distance of the Project site, and suitable habitat was present on the Project site. A moderate classification was also assigned when recorded observations were identified within known dispersal distance of the Project site but habitat on the Project site was of limited or marginal quality.

- **Low:** The potential for a species to occur was considered low when the Project site was within the range of the species, but no recorded observations within known dispersal distance were identified, and habitat on the Project site was limited or of marginal quality. The potential for a species to occur was also classified as low when the Project site was located at the edge of a species' range and recorded observations were extremely rare, but habitat on the Project site was suitable.
- **None:** The potential for a species to occur was considered none when a species was not expected to occur within or adjacent to the Project site due to lack of suitable habitat and recorded observations within dispersal distance from the Project site.

4.3 SPECIAL-STATUS PLANTS IN VICINITY OF THE PROJECT SITE

According to the CNDDB and the CNPS Inventory of Rare, Threatened, and Endangered Plants of California, a total of 39 special-status plant species are known to occur in the vicinity of the Project site. All of these species require specialized habitats that *do not* occur within the Project site's ruderal and orchard vegetation communities, including chapparal, bogs and fens, marshes and swamps, meadows and seeps, riparian, coastal habitats, woodlands and forests. A brief description of each of these species is included within Appendix A (Table A-1), including the species' status, habitat, and probability of occurring on the Project site. No special-status plants have been observed onsite during general surveys.

4.4 SPECIAL-STATUS WILDLIFE IN VICINITY OF THE PROJECT SITE

According to the CNDDB and existing literature, a total of 7 special-status wildlife species are known to occur within 3 miles of the Project site. A brief description of each of these species is included in Appendix A (Table A-2), including the species' status, habitat, and probability of occurring within the Project site.

Due to lack of suitable habitat, all of the regionally known special-status wildlife species identified as occurring in the vicinity of the Project site are not expected to occur on the Project site. The routinely disturbed and actively managed ruderal and orchard habitats on the Project site do not provide necessary habitat components for these special-status species, which require the following habitat types:

- streams/rivers (Coho salmon - Central California Coast Evolutionary Significant Unit [*Oncorhynchus kisutch*], steelhead - Central California Coast Distinct Population Segment [*Oncorhynchus mykiss irideus*] and California freshwater shrimp [*Syncaris pacifica*])
- marshes/lagoons or emergent wetlands (tri-colored blackbird [*Agelaius tricolor*])

- habitats adjacent to ponds and/or streams (California giant salamander [*Dicamptodon ensatus*], western pond turtle [*Emys marmorata*], and California red-legged frog [*Rana draytonii*])
- grasslands adjacent to seasonal wetlands and ponds on the Santa Rosa Plain (California tiger salamander [*Ambystoma californiense*])

4.4.1 Special-Status Birds

The ruderal habitat and the onsite trees provide suitable nesting habitat for a variety of birds including passerines and raptors. No nests were observed onsite, however, owing to the mobile nature of birds and the seasonality of their nesting cycle, and in light of the presence of abundant suitable nesting habitat onsite, it is possible that birds could nest on the Project site during future nesting seasons.

4.5 IMPACT ASSESSMENT

4.5.1 Special-Status Birds

As part of site preparation activities, the entire Project site (with the exception of locations where trees are to be protected in-place) would be graded and compacted, and onsite shrubs and trees would be removed, resulting in permanent impacts to suitable nesting bird habitat. While it is unlikely that the Project would result in take of individual birds, active nests (i.e., nests with viable eggs and/or chicks) may be affected by Project-related activities that result in nest abandonment or destruction.

Implementation of the Mitigation Measure BIO-1, which requires preconstruction nesting bird surveys as well as monitoring of nests observed onsite until a qualified biologist determines that nesting is complete and young have fledged, would minimize potential for adverse effects on nesting birds. Accordingly, while Project implementation could result in impacts to special-status birds, these impacts would be reduced to a level considered less than significant pursuant to CEQA.

5 POTENTIAL IMPACTS TO SPECIAL-STATUS HABITATS

5.1 APPLICABLE LAWS

Aquatic resources and special status species habitats are regulated by state and federal resource agencies (USACE, California State Water Resources Control Board [SWRCB], and CDFW) and are accordingly legally protected via the federal and/or state laws defined below in addition to CEQA.

5.1.1 Section 404 Clean Water Act (CWA)

Section 404 of the CWA, administered by USACE, establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including open water. Per Section 404, a permit is required prior to discharge of fill material into waters of the United States, unless the activity is exempt from Section 404 regulation.

Waters of the United States generally include tidal waters, lakes, ponds, rivers, streams (including intermittent streams), and wetlands. Other waters are non-tidal, perennial, and intermittent watercourses and tributaries to such watercourses [33 C.F.R. 328.3(a), 51 F.R. 41250, November 13, 1986].

5.1.2 National Pollutant Discharge Elimination System (NPDES) Permit Program

The NPDES Permit Program, also authorized by the CWA, controls water pollution by regulating point sources (discrete conveyances such as pipes or constructed ditches) that discharge pollutants into waters of the United States. The implementation of this federal program has been charged to the State of California for implementation through the SWRCB and Regional Water Quality Control Boards (Regional Water Board). In California, NPDES permits are also referred to as waste discharge requirements (WDR) that regulate discharges to waters of the United States.

Also implemented by the Regional Water Board is the Municipal Storm Water Permitting Program, which regulates storm water discharges from municipal separate storm sewer systems (MS4s). The MS4 Permit Program was established to restore and maintain the chemical, physical, and biological integrity waters of the U.S./State and reduce/eliminate storm water pollution.

5.1.3 Section 401 Clean Water Act (CWA)

The SWRCB and its nine regional water boards have been charged with the protection and enhancement of water quality in the state of California. Pursuant to the Porter Cologne Water Quality Control Act (Porter Cologne), waters of the State are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state." This is generally taken to include all waters of the U.S., all surface waters not considered to be waters of the U.S. (non-jurisdictional wetlands), groundwater, and territorial seas (with territorial boundaries extending 3.0 nautical miles beyond outermost islands, reefs, and rocks and includes all waters between the islands and the coast). Per Porter Cologne, the Regional Water Board has authority to regulate discharges of fill and dredged material into Waters of the State.

5.1.4 FESA

When species are listed as endangered or threatened under FESA, the federal government is also directed to designate critical habitat for these species. Critical habitat is designated by the Services to protect areas that are essential to the survival of federally listed wildlife species. Under FESA, critical habitat is defined as a "specific geographic areas that contain features essential to the conservation of an endangered or threatened species and that may require special management and protection." When designating critical habitat, the Services focused on the principal biological or physical features in the defined area that are essential to the conservation of the listed species. These features are termed primary constituent elements. The 2016 critical habitat regulations (81 FR 7214, Feb. 11, 2016, codified at 50 CFR 402.02) replaced this term with physical or biological features (PBFs). The FESA requires Federal agencies to use their authorities to conserve endangered and threatened species and to consult USFWS and/or NMFS about actions that they carry out, fund, or authorize to ensure that they will not destroy or adversely modify critical habitat.

5.2 METHODOLOGY

Information about aquatic resources and special-status habitats that could occur on the Project site was obtained from the following sources:

- CNDDB RareFind 5 (CDFW 2021; CDFW 2023
- USFWS Critical Habitat shapefiles
- Existing literature as cited in the text

The CNDDB was used to query all special-status habitats with known occurrences within 3 miles of the Project site. USFWS shapefiles were used to map critical habitat in the vicinity of the Project site.

5.3 AQUATIC RESOURCES

The Project site does not support any potentially jurisdictional WOTUS under the jurisdiction of the USACE pursuant to the CWA (Section 404) and under the jurisdiction of the State Water Quality Control Board pursuant to the CWA (Section 401) and Porter Cologne.

5.4 CRITICAL HABITAT

The Project site does not occur within or near any designated critical habitat. A single designated critical habitat unit occurs approximately 1.2 miles east of the Project site. This critical habitat was designated for the Sonoma County California tiger salamander Distinct Population Segment (DPS) in 2011 (Federal Register 76:54346-54372)(Figure 3. Critical Habitat Map).

5.5 WILDLIFE CORRIDORS AND NURSERY SITES

The Project site does not act as a wildlife corridor or a nursery site. A wildlife corridor is a portion of land that adjoins two or more larger areas of similar natural environment, often connecting wildlife populations separated by natural or created activities, disturbances, or structures. Wildlife corridors are used for dispersal and migration of wildlife, allowing for genetic exchange, population growth, and access to larger stretches of suitable habitats, and reducing habitat fragmentation. While the Project site provides marginal resting and roosting habitat, it is isolated from adjacent parcels by development and the heavily trafficked Highway 12 and Sebastopol Road.

A nursery site is an area where juveniles occur at higher densities, avoid predation more successfully, or grow faster there than in a different habitat (Beck et. al. 2001). The Project site exhibits no evidence of being a nursery site. While suitable nesting bird habitat occurs onsite, the site's small size, disturbed condition, and location within a developed and disturbed setting preclude its use as a nursery location.

5.6 SENSITIVE NATURAL COMMUNITIES

No Sensitive Natural Communities occur on the Project site. According to the CNDDB, three Sensitive Natural Communities occur in the vicinity of the Project site: Northern Hardpan Vernal Pool, Northern Vernal Pool, and Coastal and Valley Freshwater Marsh. However, there is no evidence for any of these Sensitive Natural Communities on site. No vernal pools or marshes occur on the Project site, and these Sensitive Natural Communities likewise do not occur onsite.

Coast Live Oak, a component of Coast Live Oak Woodland and Forest Sensitive Natural Community (Code 71.060.00), occurs on the Project site. The collective definition of Coast Live Oak Woodland and Forest provided by CNPS (CNPS 2023b) includes coast live oak as a dominant or co-dominant in the upland tree canopy with big leaf maple (*Acer macrophyllum*), madrone (*Arbutus menziesii*), California black walnut (*Juglans californica*), blue oak (*Quercus douglasii*), Engelmann oak (*Quercus engelmannii*), California black oak (*Quercus kelloggii*), valley oak, and California bay (*Umbellularia californica*), with a relative canopy cover of 50%. Coast live oaks do not make up 50% or greater of the canopy cover in areas where they occur on the Project site. Accordingly, the plant community associated with the Coast Live Oak Woodland and Forest community does not occur onsite.

Waters of the State are generally likewise identified as a sensitive natural community by CDFW, however there are no waters of the State that occur on the Project site.

5.7 IMPACT ASSESSMENT

5.7.1 Waters of the U.S./State

Project implementation would not result in impacts to waters of the U.S./State.

5.7.2 Critical Habitat

Project implementation would not result in impacts to designated critical habitat.

5.7.3 Wildlife Corridors and Nursery Sites

Project implementation would not result in impacts to wildlife corridors or nursery sites.

5.7.4 Sensitive Natural Communities

Project implementation would not result in impacts to Sensitive Natural Communities.

6 APPLICABLE LOCAL PLANS, ORDINANCES, AND LAWS

6.1 SEBASTOPOL GENERAL PLAN 2035

The General Plan 2035 was adopted by the City of Sebastopol in 2016. The General Plan is the guiding document for development within the City of Sebastopol and addresses issues related to physical development, growth management, transportation services, public facilities, community design, energy efficiency, and conservation of resources through Goals and Policies that are required for projects within the City of Sebastopol Planning Area.

Additional local natural resource conservation and land use policies presented within the 2035 General Plan are applicable to the proposed Project. Only policy measures and recommendations regarding impacts to natural resources and deemed pertinent to the proposed Project are addressed in this section. Policies regarding specific project requirements such as County implementation of the review process and specific action recommendations for local, state, or federal agencies are not addressed below. Similarly, policy measures and recommendations that are clearly referring to projects or activities that are not related to the proposed Project (e.g., development on hillsides, filling and dredging of lagoons, etc.) are not addressed below.

6.1.1 Goal COS 6: Conserve, Protect, and Enhance Trees and Native Vegetation

Policy COS 6-1
Conserve existing native vegetation where possible and integrate regionally native plant species into development and infrastructure projects where appropriate.

A total of 41 trees and additional understory vegetation will be removed as part of site preparation, both native and non-native species will be included. The city of Sebastopol prescribes a replacement ratio of 2:1 for native trees with a d.b.h of at least 10 inches and non-native trees with a d.b.h of at least 20 inches. Implementation of Mitigation Measure BIO-2 below, which would include replacement of trees removed from the Project site would ensure that the Project would not result in a conflict with General Plan Policy COS 6-1.

Policy COS 6-2
Require the use of primarily locally sourced native and drought-tolerant plants and trees for landscaping on public projects, if feasible, and strongly encourage their use for landscaping on private projects.

The trees to be planted for landscaping purposes on the Project site will be native species. Landscape plans shall be approved by the City prior to issuance of building permits.

Policy COS 6-3
Avoid removal of large, mature trees that provide wildlife habitat or contribute to the visual quality of the environment through appropriate project design and building siting. If full avoidance is not possible, prioritize planting of replacement trees on-site over off-site locations. Replacement trees for high-quality mature trees should generally be of like kind, and provide for comparable habitat functionality, where appropriate site conditions exist.

A total of 41 trees as defined by the City of Sebastopol are to be removed from the project site. Implementation of Mitigation Measure BIO-2 below, which would include replacement of trees removed from the Project site would ensure that the Project would not result in a conflict with General Plan Policy COS 6-3.

Policy COS 6-4
Facilitate the preservation of existing trees, the planting of additional street trees, and the replanting of trees lost through disease, new construction or by other means.

A total of 41 trees as defined by the City of Sebastopol are to be removed from the project site. Implementation of Mitigation Measure BIO-2 below, which would include replacement of trees removed from the Project site would ensure that the Project would not result in a conflict with General Plan Policy COS 6-4.

Policy COS 6-5
Require new development to incorporate trees in landscape plans.

Native trees shall be incorporated into the landscaping plans of the development. Landscape plans shall be approved by the City prior to issuance of building permits.

6.2 SEBASTOPOL TREE ORDINANCE

The City of Sebastopol adheres to a tree ordinance (Municiple Code: Chapter 8.12 – Trees Protection) (Tree Ordinance) in order to regulate the removal of large and/or significant trees (which include heritage, protected, or street trees). For undeveloped properties, the removal, alteration (i.e., trimming), or relocation of trees 4-inch or greater in diameter requires a tree removal permit. Further, the tree ordinance requires that proposed development preserve and protect heritage trees present onsite to the greatest extent possible.

An arborist survey was conducted on the Project site by Horticultural Associates in October 2022 (Appendix B). A total of 133 trees with a diameter of 6-inches or greater were identified onsite. Project implementation would require removal of 16 Coast Live Oak, 1 valley oak, 14 Coast redwood, 2 Black Oak, 5 Douglas Fir, and 3 ornamental trees. Orchard trees such as apple and pears are not included in the arborist survey as they are not protected species and most are generally over-mature, declining, decayed or dying back. The City of Sebastopol prescribes tree replacement for all trees removed. Implementation of Mitigation Measure BIO-2 below, which would include replacement of trees removed from the Project site would ensure that the Project would not result in a conflict with the Tree Ordinance.

7 MITIGATION MEASURES

Potential impacts associated with implementation of the proposed Project are addressed below. With implementation of the specific mitigation measures recommended below, all Project-related impacts to natural resources can be reduced to a level considered less than significant.

7.1 BIOLOGICAL IMPACT 1: NESTING BIRDS

The onsite vegetation and structures provide suitable nesting habitat for various birds protected pursuant to the Migratory Bird Treaty Act and California Fish and Game Code, Sections 3503, 3503.5, and 3511. Project-related activities could result in take of protected birds in the form of disturbance causing nest abandonment or destruction. The mitigation measure presented below would reduce these impacts to a level considered less than significant pursuant to the CEQA.

7.1.1 Mitigation Measure BIO-1

Vegetation removal, ground disturbance, or structure removal (collectively referred to as construction activities) shall be scheduled to avoid the bird nesting season to the greatest extent possible. The nesting season for most birds and raptors in the San Francisco Bay Area is February 1 thought September 15.

If construction activities cannot be scheduled to occur between September 16 and January 31, pre-construction surveys for nesting birds and raptors shall be completed by a qualified ornithologist or biologist to ensure that no nests shall be disturbed during project implementation. This survey shall be completed no more than 14 days prior to the initiation of construction activities. During this survey, the qualified ornithologist/biologist shall inspect all suitable nesting habitat on the Project site and within the zone of influence (the area immediately surrounding the Project site that supports suitable nesting habitat that could be impacted by the proposed Project due to visual or auditory disturbance associated with the removal of vegetation and construction activities scheduled to occur during the nesting season)

If an active nest is found sufficiently close to the work areas to be disturbed by construction activities, the qualified ornithologist/biologist, in consultation with the California Department of Fish and Wildlife, shall determine the extent of a construction free buffer zone to be established around the nest, typically 250 feet, to ensure than protected bird and raptor nests shall not be disturbed during project construction. This buffer shall remain in place until such a time as the young have been determined (by a qualified ornithologist/biologist) to have fledged.

Prior to the initiation of construction activities, the qualified ornithologist/biologist shall submit a report indicating the results of the survey and any designated buffer zones to the satisfaction of the Director of the Planning, Building, and Code Enforcement or the Director's designee.

7.2 BIOLOGICAL IMPACT 2: TREES

A total of 41 trees would be removed from the Project site as a result of Project implementation. As such, implementation of the Project has the potential to conflict with the City of Sebastopol Tree Ordinance. The following mitigation measure would ensure that the Project does not conflict with the City of Sebastopol Tree Ordinance.

7.2.1 Mitigation Measure BIO-2

All protected ordinance-sized trees removed from the Project site shall be replaced as appropriate for the size class and species of the tree removed, based on the City of Sebastopol tree mitigation requirements for native, non-native, and orchard trees. Replacement ratios for individual trees to be removed is 2:1.). Replacement trees shall be either planted onsite or at a City-approved offsite location, or a fee of $75 per replacement tree would be provided to the City of Sebastopol tree fund in-lieu off-site tree planting in the community. If onsite/offsite planting is implemented, a replacement tree planting plan shall be approved by the City along with landscape plans prior to Project implementation.

8 REFERENCES

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Table A-1. Special-Status Plant Species Known to Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Sonoma alopecurus	*Alopecurus aequalis var. sonomensis*	Federally Endangered CNPS Rank 1B.1	Freshwater marshes and swamps, and riparian scrub	This species has been recorded on the same USGS quad as the Project site (Sebastopol)	None. No marshes or swamps or riparian habitats occur on or near the Project site. The Project site does not provide suitable habitat for this species.
Vine Hill Manzanita	*Arctostaphylos densiflora*	State Endangered CNPS Rank 1B.1	Acid marine sand chaparral	This species has been recorded on the same USGS quad as the Project site (Sebastopol)	None. No chaparral occurs on or near the Project site. The Project site does not provide suitable habitat for this species.
Rincon Ridge Manzanita	*Arctostaphylos stanfordiana ssp. decumbens*	CNPS Rank 1B.1	Rhyolitic chaparral and cismontane woodland	CNPS Inventory 9-Quad Search	None. No woodlands or chaparral occur on or near the Project site. The Project site does not provide suitable habitat for this species.
Sonoma Sunshine	*Blennosperma bakeri*	Federally Endangered California Endangered CNPS Rank 1B.1	Mesic valley and foothill grassland, and vernal pools	The closest record for this species occurs approximately 1.4 miles west of the Project site (CNDDB Occurrence No. 37).	None. The project site does not provide suitable mesic habitat for this species.
Bolander's Reed Grass	*Calamagrostis bolanderi*	CNPS Rank 4.2	Bogs and fens, broadleafed upland forest, closed-cone coniferous forest, coastal scrub, mesic meadows and seeps, freshwater marshes and swamps, and North Coast coniferous forest	CNPS Inventory 9-Quad Search	None. No bogs, fens, forests, scrub, meadows, seeps, or marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Thurber's Reed Grass	*Calamagrostis crassiglumis*	CNPS Rank 2B.1	Mesic coastal scrub and freshwater marshes and swamps	CNPS Inventory 9-Quad Search	None. No marshes/swamps or scrub habitats occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Johnny-nip	*Castilleja ambigua var. ambigua*	CNPS Rank 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, and margins of vernal pools	CNPS Inventory 9-Quad Search	None. The Project site does not provide suitable habitat for this species.
Pitkin Marsh Paintbrush	*Castilleja uliginosa*	CNPS Rank 1A	Freshwater marshes and swamps	CNPS Inventory 9-Quad Search	None. No marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Rincon Ridge Ceanothus	*Ceanothus confusus*	CNPS Rank 1B.1	Closed-cone coniferous forest, chaparral, and cismontane woodland	CNPS Inventory 9-Quad Search	None. No forests, woodlands, or chaparral occur on or near the Project site. The Project site does not provide suitable habitat for this species.

Table A-1. Special-Status Plant Species Known to Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Vine Hill Ceanothus	*Ceanothus foliosus var. vineatus*	CNPS Rank 1B.1	Chaparral	CNPS Inventory 9-Quad Search	None. No chaparral occurs on or near the Project site. The Project site does not provide suitable habitat for this species.
Glory Brush	*Ceanothus gloriosus var. exaltatus*	CNPS Rank 4.3	Chaparral	CNPS Inventory 9-Quad Search	None. No chaparral occurs on or near the Project site. The Project site does not provide suitable habitat for this species.
Holly-leaved Ceanothus	*Ceanothus purpureus*	CNPS Rank 1B.2	Chaparral and cismontane woodland	CNPS Inventory 9-Quad Search	None. No woodlands or chaparral occur on or near the Project site. The Project site does not provide suitable habitat for this species.
Sonoma spineflower	*Chorizanthe valida*	Federally Endangered State Endangered CNPS Rank 1B.1	Sandy coastal prairie	This species has been recorded on the same USGS quad as the Project site (Sebastopol)	None. The Project site does not occur within the coastal region and does not provide suitable habitat for this species.
Vine Hill clarkia	*Clarkia imbricata*	Federally Endangered State Endangered CNPS Rank 1B.1	Chaparral, and valley and foothill grassland	This species has been recorded on the same USGS quad as the Project site (Sebastopol)	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Peruvian dodder	*Cuscuta obtusiflora var. glandulosa*	CNPS Rank 2B.2	Chaparral (openings), cismontane woodland, and valley and foothill grassland	CNPS Inventory 9-Quad Search	None. While the ruderal habitat occurring on the Project site provide marginal habitat for this species, this species has not been observed onsite.
Golden larkspur	*Delphinium luteum*	Federally Endangered State Rare CNPS Rank 1B.1	Chaparral, coastal prairie, and coastal scrub	This species has been recorded on the same USGS quad as the Project site (Sebastopol)	None. No chapparal or coastal region habitats occur on or near the Project site. The Project site does not provide suitable habitat for this species.
Dwarf Downingia	*Downingia pusilla*	CNPS Rank 2B.2	Mesic valley and foothill grassland, and vernal pools	The closest record for this species occurs approximately 2.0 miles south of the Project site (CNDDB Occurrence No. 86).	None. The project site does not provide suitable mesic habitat for this species.
Swamp harebell	*Eastwoodiella californica*	CNPS Rank 1B.2	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows and seeps, marshes and swamps, and North Coast coniferous forest	CNPS Inventory 9-Quad Search	None. The Project site does not provide suitable habitat for this species.
Slender cottongrass	*Eriophorum gracile*	CNPS Rank 4.3	Bogs and fens, meadows and seeps, and upper montane coniferous forest	CNPS Inventory 9-Quad Search	None. No bogs, fens, meadows, seeps, or forests occur on or near the Project site. The Project site does not provide suitable habitat for this species.

Table A-1. Special-Status Plant Species Known to Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Fragrant fritillary	*Fritillaria liliacea*	CNPS Rank 1B.2	Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland	CNPS Inventory 9-Quad Search	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Congested-headed hayfield tarplant	*Hemizonia congesta* ssp. *congesta*	CNPS Rank 1B.2	Valley and foothill grassland	The closest record for this species occurs approximately 1.0 mile west of the Project site (CNDDB Occurrence No. 27).	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Thin-lobed horkelia	*Horkelia tenuiloba*	CNPS Rank 1B.2	Broadleafed upland forest, chaparral, and valley and foothill grassland	CNPS Inventory 9-Quad Search	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Harlequin lotus	*Hosackia gracilis*	CNPS Rank 4B.2	Broadleafed upland forest, coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal prairie, coastal scrub, meadows and seeps, marshes and swamps, North Coast coniferous forest, and valley and foothill grassland	CNPS Inventory 9-Quad Search	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Coast iris	*Iris longipetala*	CNPS Rank 4B.2	Coastal prairie, lower montane coniferous forest, and meadows and seeps	CNPS Inventory 9-Quad Search	None. No prairies, forests, meadows, or seeps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Burke's goldfields	*Lasthenia burkei*	Federally Endangered State Endangered CNPS Rank 1B.1	Meadows and seeps (mesic), and vernal pools	The closest record for this species occurs approximately 1.1 miles northwest of the Project site (CNDDB Occurrence No. 28).	None. The Project site does not provide suitable mesic habitat for this species.
Baker's goldfields	*Lasthenia californica ssp. bakeri*	CNPS Rank 1B.2	Openings in closed-cone coniferous forest, coastal scrub, meadows and seeps, and marshes and swamps	CNPS Inventory 9-Quad Search	None. No forests, scrub, meadows, seeps, or marshes or swamps occur on or near the Project site. The Project site does not provide suitable habitat for this species.
Legenere	*Legenere limosa*	CNPS Rank 1B.1	Vernal pools	The closest record for this species occurs approximately 1.8 miles southwest of the Project site (CNDDB Occurrence No. 39).	None. No vernal pools occur on or near the Project site. The Project site does not provide suitable habitat for this species.

Table A-1. Special-Status Plant Species Known to Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Pitkin marsh lily	*Lilium pardalinum* ssp. *pitkinense*	Federally Endangered State Endangered CNPS Rank 1B.1	Cismontane woodland, meadows and seeps, and freshwater marshes and swamps	This species has been recorded on the same USGS quad as the Project site (Sebastopol)	None. No woodlands, meadows, seeps, or marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Sebastopol meadowfoam	*Limnanthes vinculans*	Federally Endangered State Endangered CNPS Rank 1B.1	Vernally mesic meadows and seeps, valley and foothill grassland, and vernal pools	The closest record for this species occurs approximately 0.9 mile west of the Project site (CNDDB Occurrence No. 22).	None. The Project site does not provide suitable mesic habitat for this species
Marsh microseris	*Microseris paludosa*	CNPS Rank 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland	The closest record for this species occurs approximately 2.7 miles south of the Project site (CNDDB Occurrence No. 20).	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Baker's navarretia	*Navarretia leucocephala ssp. bakeri*	CNPS Rank 1B.1	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools	The closest record for this species occurs approximately 0.9 mile west of the Project site (CNDDB Occurrence No. 21).	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Lobb's aquatic buttercup	*Ranunculus lobbii*	CNPS Rank 4B.2	Cismontane woodland, North Coast coniferous forest, valley and foothill grassland, and vernal pools	CNPS Inventory 9-Quad Search	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
White beaked-rush	*Rhynchospora alba*	CNPS Rank 2B.2	Bogs and fens, meadows and seeps, and freshwater marshes and swamps	CNPS Inventory 9-Quad Search	None. No bogs, fens, meadows, seeps, or marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
California beaked-rush	*Rhynchospora californica*	CNPS Rank 1B.1	Bogs and fens, lower montane coniferous forest, meadows and seeps, and freshwater marshes and swamps	CNPS Inventory 9-Quad Search	None. No bogs, fens, forests, meadows, seeps, or marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Brownish beaked-rush	*Rhynchospora capitellata*	CNPS Rank 2B.2	Lower montane coniferous forest, meadows and seeps, marshes and swamps, and upper montane coniferous forest	CNPS Inventory 9-Quad Search	None. No forests, meadows, seeps, or marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Round-headed beaked-rush	*Rhynchospora globularis*	CNPS Rank 2B.1	Freshwater marshes and swamps	CNPS Inventory 9-Quad Search	None. No marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.

Table A-1. Special-Status Plant Species Known to Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Two-fork clover	*Trifolium amoenum*	Federally Endangered CNPS Rank 1B.1	Coastal bluff scrub and valley and foothill grassland (sometimes serpentinite)	An historic record for this species occurs in the vicinity of the Project site (CNDDB Occurrence No. 20).	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Saline clover	*Trifolium hydrophilum*	CNPS Rank: 1B.2	Mesic soils in marshes and swamps, valley and foothill grassland, and vernal pools	The closest record for this species occurs approximately 2.5 miles west of the Project site (CNDDB Occurrence No. 16).	None. The project site does not provide suitable mesic habitat for this species.
Oval-leaved viburnum	*Viburnum ellipticum*	CNPS Rank: 2B.3	Mesic soils in marshes and swamps, valley and foothill grassland, and vernal pools	CNPS Inventory 9-Quad Search	None. The project site does not provide suitable mesic habitat for this species.

Table A-2. Special-Status Wildlife Species Known to Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Tri-colored Blackbird	*Agelaius tricolor*	California Candidate Endangered	Nests in emergent wetland with tall, dense cattails or tules, or thickets of willow, blackberry, or tall herbs	An historic record (1976) for this species is located at the Project site (CNDDB Occurrence No. 831).	None. Emergent wetlands do not occur on or near the Project site. The Project site does not provide suitable habitat for this species.
California Tiger Salamander	*Ambystoma californiense*	Federally Endangered California Threatened	Grasslands adjacent to seasonal wetlands and ponds	The closest record for this species occurs approximately 2 miles east of the Project site (CNDDB Occurrence No. 60).	None. The Project site occurs outside of the known range for this species.
California Giant Salamander	*Dicamptodon ensatus*	California Species of Special Concern	In or near streams in damp forests and riparian habitats	The closest record for this species is located approximately 2.8 miles northwest of the Project site (CNDDB Occurrence No. 221).	None. No damp forests or riparian habitats occur on or near the Project site. The Project site does not provide suitable habitat for this species.
Western Pond Turtle	*Emys marmorata*	California Species of Special Concern	A variety of habitats adjacent to permanent or nearly permanent water.	The closest record for this species is located approximately 1.2 mile east of the Project site (CNDDB Occurrence No. 682).	None. This Project site does not provide suitable habitat for this species.
Coho Salmon - Central California Coast ESU	*Oncorhynchus kisutch*	Federally Endangered	Spawn from streams and freshwater tributaries to estuarine and marine waters of the Pacific Ocean, from Punta Gorda, CA to Aptos Creek, including the San Francisco Bay and tributaries.	The closest record for this species is located approximately 3 miles northwest of the Project site (CNDDB Occurrence No. 25) in Mark West Creek.	None. No streams or rivers on the Project site. The Project site does not provide suitable habitat for this species.
California Red-Legged Frog	*Rana draytonii*	Federally Threatened California Species of Special Concern	Grassland and riparian habitats adjacent to creeks/streams with plunge pools or ponds	The closest record for this species is located approximately 2.4 miles south of the Project site (CNDDB Occurrence No. 742).	None. No streams or ponds occur on or near the Project site. The Project site does not provide suitable habitat for this species. Further, this species is not known to occur in Sebastopol.
California Freshwater Shrimp	*Syncaris pacifica*	Federally Endangered California Endangered	Perennially flowing streams with slow moving water and flat gradients	The closest record for this species is located approximately 1 mile southwest of the Project site (CNDDB Occurrence No. 9).	None. No perennially flowing streams or rivers occur on or near the Project site. The Project site does not provide suitable habitat for this species.

HORTICULTURAL Associates

Consultants in Horticulture and Arboriculture

TREE PRESERVATION AND MITIGATION REPORT

Gravenstein Village
Sebastopol, CA

Prepared For:

City Ventures
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San Francisco, CA 94105

Prepared by:

John C. Meserve
International Society of Arboriculture
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor

July 18, 2019

HORTICULTURAL Associates

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P.O Box 1261, Glen Ellen, CA 95442

July 18, 2019

Samantha Hauser
City Ventures
444 Spear Street, Suite 200
San Francisco, CA 94105

Re: Updated *Tree Preservation and Mitigation Report*, Gravenstein Village, Sebastopol, California

Samantha,

Attached you will find our updated Tree Preservation and Mitigation Report for the above noted site in Sebastopol. A total of 133 trees were evaluated, and this includes all protected trees over 10 inches in trunk diameter and non-protected trees between 6 and 9 inches in diameter.

The Sebastopol Tree Ordinance requires protected trees 10 inches and greater to be included in an Arborist Report. We have also included trees 6 inches to 9 inches to be thorough. Trees of this smaller size are not protected, and 42 of the 133 in this report are in this smaller size category.

There are a number of large Acacias at this site, and this species was also not included in our Inventory because it is found on the Sebastopol 'escaped exotic' list and does not require retention.

This site is a remnant apple orchard which originated in the early 1900's, according to CEQA documents prepared in the late 1990's. Apples are also not a protected species, and most are generally over-mature, declining, decayed, or dying back. No apples were included in this Inventory.

Each tree is identified in the field with a numbered aluminum tag placed on the trunk at approximately eye level.

All trees in this report were evaluated and documented for species, size, health, and structural condition. The *Tree Inventory Chart* also includes our evaluation of the expected impacts of the proposed development and based on that impact a recommendation for preservation or removal is provided. The *Tree Location Plan* shows the location and numbering sequence of all evaluated trees.

~ Voice 707-935-3911 Fax 707-935-7103 ~

EXISTING SITE CONDITIONS SUMMARY

The project site consists of an abandoned apple orchard bordered on one side by a walking path, three sides by residential development, one side by a City street, and one side by commercial development.

EXISTING TREE SUMMARY

Native species present include Coast Live Oak, Black Oak, Douglas Fir, and Valley Oak.

California native species that have been planted as ornamentals include Coast Redwood, White Alder, and Incense Cedar.

Non-native species other than Acacia and Apple include Honey Locust, Pine, Deodar Cedar, and Chinese Pistache.

Some large off-site trees that overhang the site were also included in this inventory.

Please feel free to contact me if you have questions or if additional discussion is required.

Regards,

John C. Meserve
Consulting Arborist and Horticulturist
ISA Certified Arborist, WE #0478A
ISA Tree Risk Assessment Qualified

KEY TO TREE INVENTORY CHART

KEY TO TREE INVENTORY CHART

Gravenstein Village
Healdsburg, California

Tree Number

Each tree has been identified in the field with an aluminum tag and reference number. Tags are attached to the trunk at approximately eye level and the *Tree Location Plan* illustrates the location of each numbered tree.

Species

Each tree has been identified by genus, species and common name. Many species have more than one common name.

Trunk

Each trunk has been measured, to the nearest one-half inch, to document its diameter at 4 feet above adjacent grade. Trunk diameter is a good indicator of age, and is commonly used to determine mitigation replacement requirements.

Height

Height is estimated in feet, using visual assessment.

Radius

Radius is estimated in feet, using visual assessment. Since many canopies are asymmetrical, it is not uncommon for a radius estimate to be an average of the canopy size.

Health

The following descriptions are used to rate the health of a tree. Trees with a rating of 4 or 5 are very good candidates for preservation and will tolerate more construction impacts than trees in poorer condition. Trees with a rating of 3 may or may not be good candidates for preservation, depending on the species and expected construction impacts. Trees with a rating of 1 or 2 are generally poor candidates for preservation.

(5) Excellent - health and vigor are exceptional, no pest, disease, or distress symptoms.

(4) Good - health and vigor are average, no significant or specific distress symptoms, no significant pest or disease.

(3) Fair - health and vigor are somewhat compromised, distress is visible, pest or disease may be present and affecting health, problems are generally correctable.

(2) Marginal - health and vigor are significantly compromised, distress is highly visible and present to the degree that survivability is in question.

(1) Poor - decline has progressed beyond the point of being able to return to a healthy condition again. Long-term survival is not expected. This designation includes dead trees.

Structure

The following descriptions are used to rate the structural integrity of a tree. Trees with a rating of 3 or 4 are generally stable, sound trees which do not require significant pruning, although cleaning, thinning, or raising the canopy might be desirable. Trees with a rating of 2 are generally poor candidates for preservation unless they are preserved well away from improvements or active use areas. Significant time and effort would be required to reconstruct the canopy and improve structural integrity. Trees with a rating of 1 are hazardous and should be removed.

(4) Good structure - minor structural problems may be present which do not require corrective action.

(3) Moderate structure - normal, typical structural issues which can be corrected with pruning.

(2) Marginal structure - serious structural problems are present which may or may not be correctable with pruning, cabling, bracing, etc.

(1) Poor structure - hazardous structural condition which cannot be effectively corrected with pruning or other measures, may require removal depending on location and the presence of targets.

Expected Impacts

Considering the proximity of construction activities, type of activities, tree species, and tree condition - the following ratings are used to estimate the amount of impact on tree health and stability. Most trees will tolerate a (1) rating, many trees could tolerate a (2) rating with careful consideration and mitigation, but trees with a (3) rating are poor candidates for preservation due to their very close proximity to construction or because they are located within the footprint of construction and cannot be preserved.

(3) A significant impact on long term tree integrity can be expected as a result of proposed development.

(2) A moderate impact on long term tree integrity can be expected as a result of proposed development.

(1) A minor impact on long term tree integrity can be expected as a result of proposed development.

(0) No impact is expected

Recommendations

Recommendations are provided for removal or preservation. For those being preserved, protection measures and mitigation procedures to offset impacts and improve tree health are provided.

(1) Preservation appears to be possible.

(2) Removal is required due to significant development impacts.

(3) Removal is recommended due to poor health or hazardous structure.

(4) Removal is required due to significant development impacts and poor existing condition.

(5) Removal is recommended due to poor species characteristics.

(6) Install temporary protective fencing at the edge of the dripline, or edge of approved construction, prior to beginning grading or construction. Maintain fencing in place for duration of all construction activity in the area.

(7) Maintain existing grade within the fenced portion of the dripline. Route drainage swales and all underground work outside the dripline.

(8) Place a 4" layer of chipped bark mulch over the soil surface within the fenced dripline prior to installing temporary fencing. Maintain this layer of mulch throughout construction.

(9) Prune to clean, raise, or provide necessary clearance. Prune to reduce branches that are over-loaded, over-extended, largely horizontal, arching, or have foliage concentrated near the branch ends, per International Society of Arboriculture Pruning Standards.

Pruning to occur by, or under the supervision of, an Arborist certified by the International Society of Arboriculture. Pruning Standards are attached to this report.

TREE INVENTORY CHART

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
1	*Quercus agrifolia*	Coast Live Oak	7+9	18	12	4	3	X		3	2
2	*Quercus agrifolia*	Coast Live Oak	8.5+multiple	20	20	4	3	X		3	2
3	*Quercus agrifolia*	Coast Live Oak	10.5+13	25	20	4	3			1	1, 6, 7, 8, 9
4	*Quercus agrifolia*	Coast Live Oak	20.5	35	20	4	3			1	1, 6, 7, 8, 9
5	*Quercus agrifolia*	Coast Live Oak	7.5+5+4+4	15	9	4	3	X		1	1, 6, 7, 8, 9
6	*Quercus agrifolia*	Coast Live Oak	11.5+10+7.5+8	20	18	4	3			3	2
7	*Quercus agrifolia*	Coast Live Oak	6+multiple	15	14	4	3	X		3	2
8	*Quercus agrifolia*	Coast Live Oak	8.5	15	12	3	3	X		2	1, 6, 7, 8, 9
9	*Quercus lobata*	Valley Oak	13	40	20	4	3			3	2
10	*Quercus kelloggi*	Black Oak	13+10	30	22	4	3			3	2
11	*Quercus agrifolia*	Coast Live Oak	13+14.5	35	24	4	2		Already braced	3	2
12	*Sequoia sempervirens*	Coast Redwood	14.5	35	14	4	3			1	1, 6, 7, 8, 9
13	*Quercus agrifolia*	Coast Live Oak	16	25	18	4	3			3	2

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
14	*Sequoia sempervirens*	Coast Redwood	12	25	10	4	3			2	1, 6, 7, 8, 9
15	*Sequoia sempervirens*	Coast Redwood	15	35	11	4	3			2	1, 6, 7, 8, 9
16	*Sequoia sempervirens*	Coast Redwood	14.5	35	10	4	3			2	1, 6, 7, 8, 9
17	*Sequoia sempervirens*	Coast Redwood	16	35	11	4	3			2	1, 6, 7, 8, 9
18	*Quercus agrifolia*	Coast Live Oak	8	20	12	4	3	X		3	2
19	*Sequoia sempervirens*	Coast Redwood	8	25	9	4	3	X		2	1, 6, 7, 8, 9
20	*Sequoia sempervirens*	Coast Redwood	11.5	35	12	4	3			3	2
21	*Pseudotsuga menziesii*	Douglas Fir	±24	60	22	3	3			2	1, 6, 7, 8, 9
22	*Quercus agrifolia*	Coast Live Oak	9	12	9	3	3	X	Drought stressed in past, good new growth this season	3	2
23	*Quercus agrifolia*	Coast Live Oak	11.5	16	12	3	3		Drought stressed in past, good new growth this season	2	1, 6, 7, 8, 9
24	*Pseudotsuga menziesii*	Douglas Fir	8.5	22	10	3	3	X		2	1, 6, 7, 8, 9
25	*Quercus agrifolia*	Coast Live Oak	10	15	11	3	3		Drought stressed in past, good new growth this season	2	1, 6, 7, 8, 9
26	*Quercus kelloggi*	Black Oak	7+7	18	13	4	3	X		3	2

TREE INVENTORY
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Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
27	*Quercus agrifolia*	Douglas Fir	8+7.5	18	14	3	3	X		3	2
28	*Pseudotsuga menziesii*	Douglas Fir	8	30	11	4-3	3	X		2	1, 6, 7, 8, 9
29	*Quercus agrifolia*	Coast Live Oak	11.5	18	14	3	3		Drought stressed in past, good new growth this season	3	2
30	*Sequoia sempervirens*	Coast Redwood	15	35	11	4	3			3	2
31	*Sequoia sempervirens*	Coast Redwood	11	30	10	4	3			3	2
32	*Sequoia sempervirens*	Coast Redwood	14.5	35	12	4	3			3	2
33	*Sequoia sempervirens*	Coast Redwood	16	38	13	4	3			3	2
34	*Pseudotsuga menziesii*	Douglas Fir	7	22	9	3	3	X		1	1, 6, 7, 8, 9
35	*Pseudotsuga menziesii*	Douglas Fir	9	20	9	3	3	X		3	2
36	*Sequoia sempervirens*	Coast Redwood	17	3	11					3	2
37	*Sequoia sempervirens*	Coast Redwood	15	4	11	4	3			3	2
38	*Sequoia sempervirens*	Coast Redwood	15	35	11	4	3			3	2
39	*Sequoia sempervirens*	Coast Redwood	14	35	10	4	3			3	2

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
40	*Sequoia sempervirens*	Coast Redwood	16	40	12	4	3			3	2
41	*Sequoia sempervirens*	Coast Redwood	13	35	10	4	3			3	2
42	*Sequoia sempervirens*	Coast Redwood	15.5	35	11	4	3			3	2
43	*Sequoia sempervirens*	Coast Redwood	16	40	11	4	3			3	2
44	*Quercus agrifolia*	Coast Live Oak	14+7.5	25	18	4	3			1	1, 6, 7, 8, 9
45	*Sequoia sempervirens*	Coast Redwood	14	30	10	4	3			1	1, 6, 7, 8, 9
46	*Sequoia sempervirens*	Coast Redwood	14	35	12	4	3			1	1, 6, 7, 8, 9
47	*Quercus agrifolia*	Coast Live Oak	28	45	24	4	3		Co-dominant trunks	1	1, 6, 7, 8, 9
48	*Quercus lobata*	Valley Oak	7+5+2.5	18	11	4	3	X		1	1, 6, 7, 8, 9
49	*Quercus agrifolia*	Coast Live Oak	±6+8+8	25	16	4	3	X		1	1, 6, 7, 8, 9
50	*Quercus agrifolia*	Coast Live Oak	7.5+6+6.5+6	20	11	4	3	X		1	1, 6, 7, 8, 9
51	*Sequoia sempervirens*	Coast Redwood	12	35	11	4	3			1	1, 6, 7, 8, 9
52	*Sequoia sempervirens*	Coast Redwood	13.5	38	12	4	3			1	1, 6, 7, 8, 9

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
53	*Sequoia sempervirens*	Coast Redwood	15.5	35	12	4	3			1	1, 6, 7, 8, 9
54	*Sequoia sempervirens*	Coast Redwood	14	35	12	4	3			1	1, 6, 7, 8, 9
55	*Sequoia sempervirens*	Coast Redwood	12	30	10	4	3			1	1, 6, 7, 8, 9
56	*Quercus agrifolia*	Coast Live Oak	11.5	20	14	3	3			1	1, 6, 7, 8, 9
57	*Sequoia sempervirens*	Coast Redwood	15	35	12	4	3			1	1, 6, 7, 8, 9
58	*Sequoia sempervirens*	Coast Redwood	16	35	12	4	3			1	1, 6, 7, 8, 9
59	*Sequoia sempervirens*	Coast Redwood	15.5	35	12	4	3			1	1, 6, 7, 8, 9
60	*Sequoia sempervirens*	Coast Redwood	12.5	30	10	4	3			1	1, 6, 7, 8, 9
61	*Sequoia sempervirens*	Coast Redwood	16.5	38	14	4	3			3	2
62	*Quercus agrifolia*	Coast Live Oak	9+7.5	22	13	4	3	X		1	1, 6, 7, 8, 9
63	*Pseudotsuga menziesii*	Douglas Fir	11	30	16	4	3			1	1, 6, 7, 8, 9
64	*Pseudotsuga menziesii*	Douglas Fir	11.5	35	11	4	3			1	1, 6, 7, 8, 9
65	*Quercus agrifolia*	Coast Live Oak	9	16	12	4	3	X		1	1, 6, 7, 8, 9

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
66	*Quercus agrifolia*	Coast Live Oak	14.5	20	17	4	3			1	1, 6, 7, 8, 9
67	*Quercus agrifolia*	Coast Live Oak	11	20	16	4	3			1	1, 6, 7, 8, 9
68	*Sequoia sempervirens*	Coast Redwood	14.5	30	11	4	3			2	1, 6, 7, 8, 9
69	*Sequoia sempervirens*	Coast Redwood	12.5	30	10	4	3			2	1, 6, 7, 8, 9
70	*Sequoia sempervirens*	Coast Redwood	13	35	10	4	3			2	1, 6, 7, 8, 9
71	*Sequoia sempervirens*	Coast Redwood	11.5	30	9	4	3			1	1, 6, 7, 8, 9
72	*Sequoia sempervirens*	Coast Redwood	9	25	9	4	3	X		1	1, 6, 7, 8, 9
73	*Sequoia sempervirens*	Coast Redwood	9	26	9	4	3	X		1	1, 6, 7, 8, 9
74	*Sequoia sempervirens*	Coast Redwood	8	20	8	4	3	X		1	1, 6, 7, 8, 9
75	*Sequoia sempervirens*	Coast Redwood	6+8.5	25	8	4	3	X		1	1, 6, 7, 8, 9
76	*Quercus agrifolia*	Coast Live Oak	23	40	26	4	3			2	2
77	*Quercus agrifolia*	Coast Live Oak	26	60	26	3	3			1	1, 6, 7, 8, 9
78	*Quercus agrifolia*	Coast Live Oak	13+11+18.5+12.5+11.5	35	26	3	3			1	1, 6, 7, 8, 9

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
79	*Sequoia sempervirens*	Coast Redwood	8.5	22	9	4	3	X		1	1, 6, 7, 8, 9
80	*Quercus agrifolia*	Coast Live Oak	8+8.5	20	25	3	3	X		1	1, 6, 7, 8, 9
81	*Quercus agrifolia*	Coast Live Oak	8+16.5+12+14+ 15	50	25	3	3		Co-dominant trunks	1	1, 6, 7, 8, 9
82	*Quercus agrifolia*	Coast Live Oak	16	30	27	4	3			1	1, 6, 7, 8, 9
83	*Quercus agrifolia*	Coast Live Oak	22+12+22.5	50	27	3	3		Co-dominant trunks, included bark, anthracnose infection	1	1, 6, 7, 8, 9
84	*Pseudotsuga menziesii*	Douglas Fir	7	20	6	3	3	X		1	1, 6, 7, 8, 9
85	*Quercus agrifolia*	Coast Live Oak	15.5+14.5+15	40	25	3	3			1	1, 6, 7, 8, 9
86	*Sequoia sempervirens*	Coast Redwood	15	35	12	4	3			1	1, 6, 7, 8, 9
87	*Sequoia sempervirens*	Coast Redwood	11	30	10	4	3			1	1, 6, 7, 8, 9
88	*Sequoia sempervirens*	Coast Redwood	13	35	12	4	3			1	1, 6, 7, 8, 9
89	*Quercus agrifolia*	Coast Live Oak	7.5+10+6+6	25	16	3	3			1	1, 6, 7, 8, 9
90	*Quercus agrifolia*	Coast Live Oak	±8	18	12	3	3	X		1	1, 6, 7, 8, 9
91	*Quercus agrifolia*	Coast Live Oak	10.5+18	20	19	4	3			1	1, 6, 7, 8, 9

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
92	*Quercus agrifolia*	Coast Live Oak	15+10+5+11	25	18	3	3			1	1, 6, 7, 8, 9
93	*Pseudotsuga menziesii*	Douglas Fir	11.5	30	11	4	3			1	1, 6, 7, 8, 9
94	*Pseudotsuga menziesii*	Douglas Fir	10.5	30	11	3	3			1	1, 6, 7, 8, 9
95	*Quercus agrifolia*	Coast Live Oak	14+18	25	14	4	3			2	1, 6, 7, 8, 9
96	*Quercus agrifolia*	Coast Live Oak	7	18	10	4	3	X		1	1, 6, 7, 8, 9
97	*Quercus agrifolia*	Coast Live Oak	12	28	20	3	3			3	2
98	*Quercus agrifolia*	Coast Live Oak	18.5	30	22	4	3			1	1, 6, 7, 8, 9
99	*Quercus agrifolia*	Coast Live Oak	14.5+11	30	18	3	3			3	2
100	*Quercus agrifolia*	Coast Live Oak	6+8.5	20	18	4	3	X		1	1, 6, 7, 8, 9
101	*Quercus agrifolia*	Coast Live Oak	11+11+6	30	18	4	3			1	1, 6, 7, 8, 9
102	*Quercus agrifolia*	Coast Live Oak	10+13.5+12+9+ 13	28	24	4	3			1	1, 6, 7, 8, 9
103	*Quercus agrifolia*	Coast Live Oak	8+multiple	18	16	4	3	X		1	1, 6, 7, 8, 9
104	*Quercus agrifolia*	Coast Live Oak	6+6+5+4+5	18	12	4	3	X		3	2

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Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
105	*Quercus agrifolia*	Coast Live Oak	9+10+multiple	25	18	4	3			3	2
106	*Quercus agrifolia*	Coast Live Oak	8.5	20	16	4	3	X		1	1, 6, 7, 8, 9
107	*Quercus agrifolia*	Coast Live Oak	14+12.5	30	16	4	3			3	2
108	*Quercus agrifolia*	Coast Live Oak	30	30	20	4	3			1	1, 6, 7, 8, 9
109	*Quercus agrifolia*	Coast Live Oak	18+29	30	25	3	3		Co-dominant trunks, included bark, anthracnose infection	3	2
110	*Pseudotsuga menziesii*	Douglas Fir	8	20	6	4	3	X		3	2
111	*Gleditsia triacanthos*	Honey Locust	14	38	22	3	3			3	2
112	*Pinus sp.*	Pine	18	60	18	2	3		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
113	*Pinus sp.*	Pine	16	60	18	3	2		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
114	*Cedrus deodara*	Deodar Cedar	22	50	22	4	3		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
115	*Cedrus deodara*	Deodar Cedar	26	60	26	4	3		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
116	*Calocedrus decurrens*	Incense Cedar	9	18	7	4	3	X	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
117	*Salix matsudana "Tortuosa"*	Curly willow	14+ mulitiple	30	20	2	2		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9

TREE INVENTORY
Gravenstein Village
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Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
118	*Gleditsia triacanthos*	Honey Locust	8	18	18	3	3	X	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
119	*Pinus radiata*	Monterey pine	30+ multiple	80	35	4	2		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
120	*Ulmus americana*	American Elm	20	25	14	3	2		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
121	*Sequoia sempervirens*	Coast Redwood	32	50	17	4	2		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
122	*Sequoia sempervirens*	Coast Redwood	9	30	10	4	3	X	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
123	*Cedrus deodara*	Deodar Cedar	9	30	12	4	3	X	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
124	*Sequoia sempervirens*	Coast Redwood	33	60	18	4	3		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
125	*Sequoia sempervirens*	Coast Redwood	36	60	18	4	3		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
126	*Cedrus deodara*	Deodar cedar	14	45	15	3	3		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
127	*Alnus rhombifolia*	Alder	10	18	8	2	2		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
128	*Alnus rhombifolia*	Alder	7	18	5	2	1	X	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
129	*Sequoia sempervirens*	Coast Redwood	13	25	10	4	3			1	1, 6, 7, 8, 9
130	*Pseudotsuga menziesii*	Douglas Fir	6	16	10	3	3	X		1	1, 6, 7, 8, 9

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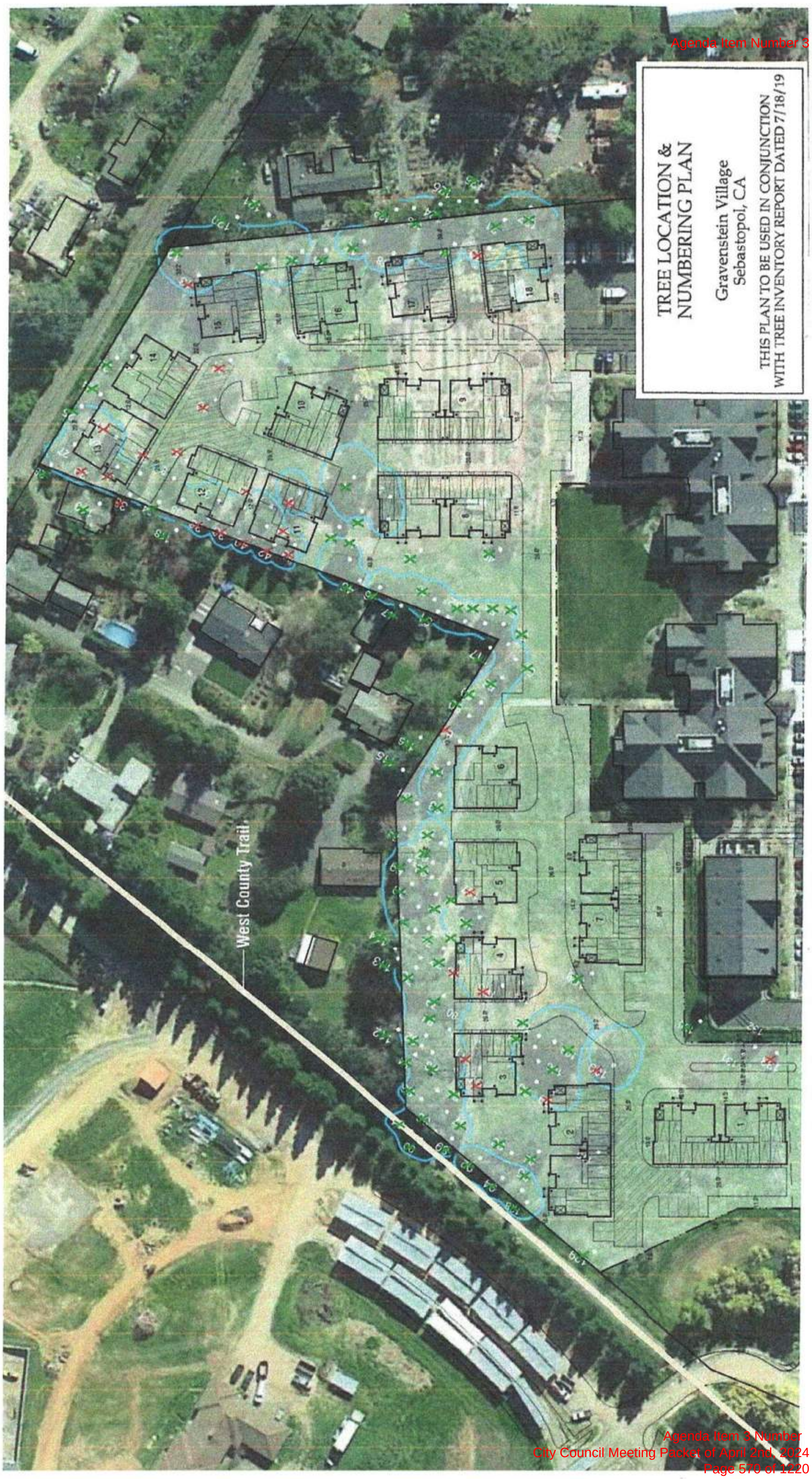
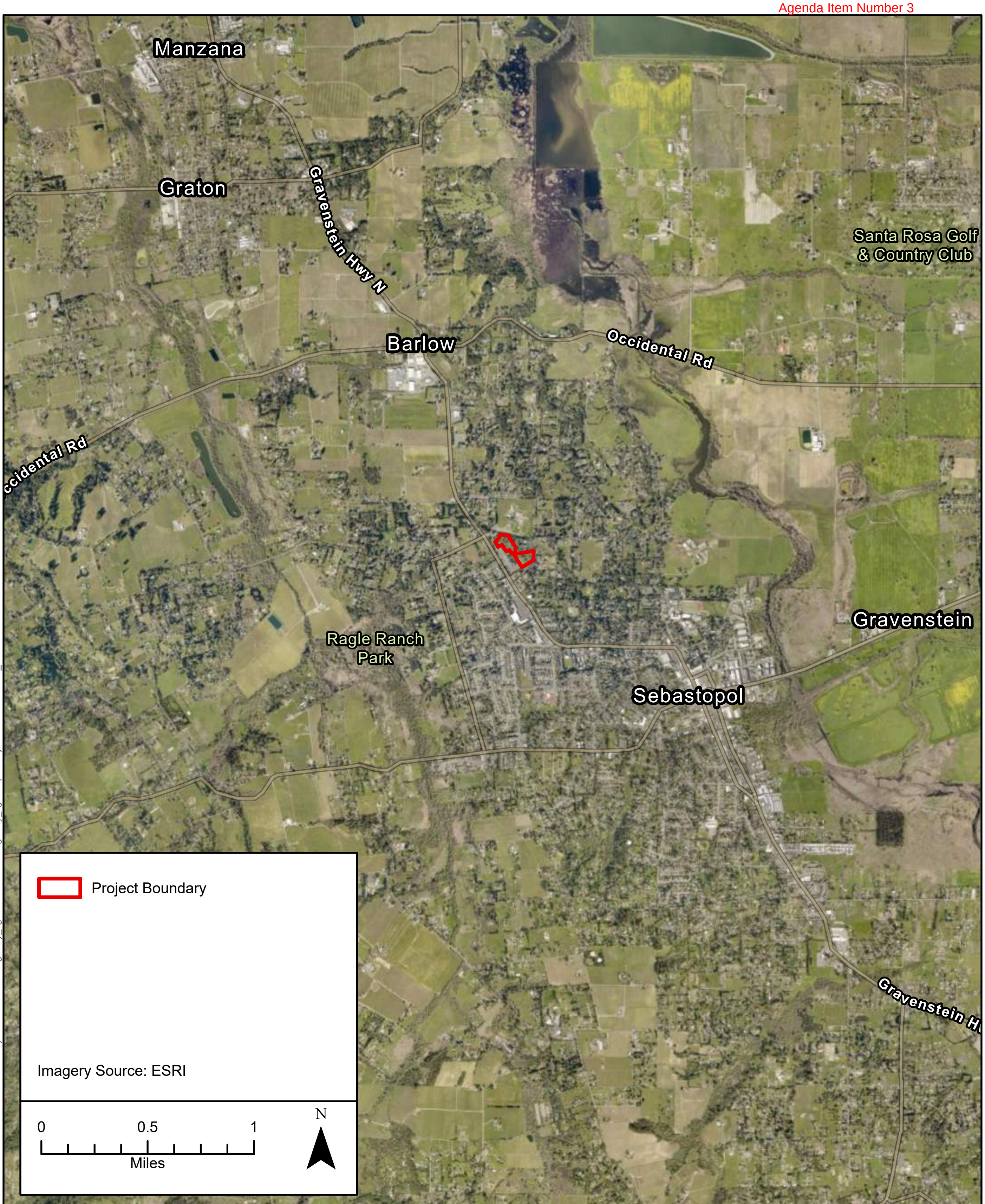
Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
131	*Pseudotsuga menziesii*	Douglas Fir	7	15	9	3	3	X		3	2
132	*Pseudotsuga menziesii*	Douglas Fir	8	16	10	3	3	X		3	2
133	*Pseudotsuga menziesii*	Douglas Fir	8	16	10	3	3	X		3	2
	Not protected trees = 9" trunk diameters or less										

TREE LOCATION PLAN


TREE LOCATION &
NUMBERING PLAN
Gravenstein Village
Sebastopol, CA
THIS PLAN TO BE USED IN CONJUNCTION
WITH TREE INVENTORY REPORT DATED 7/18/19
West County Trail



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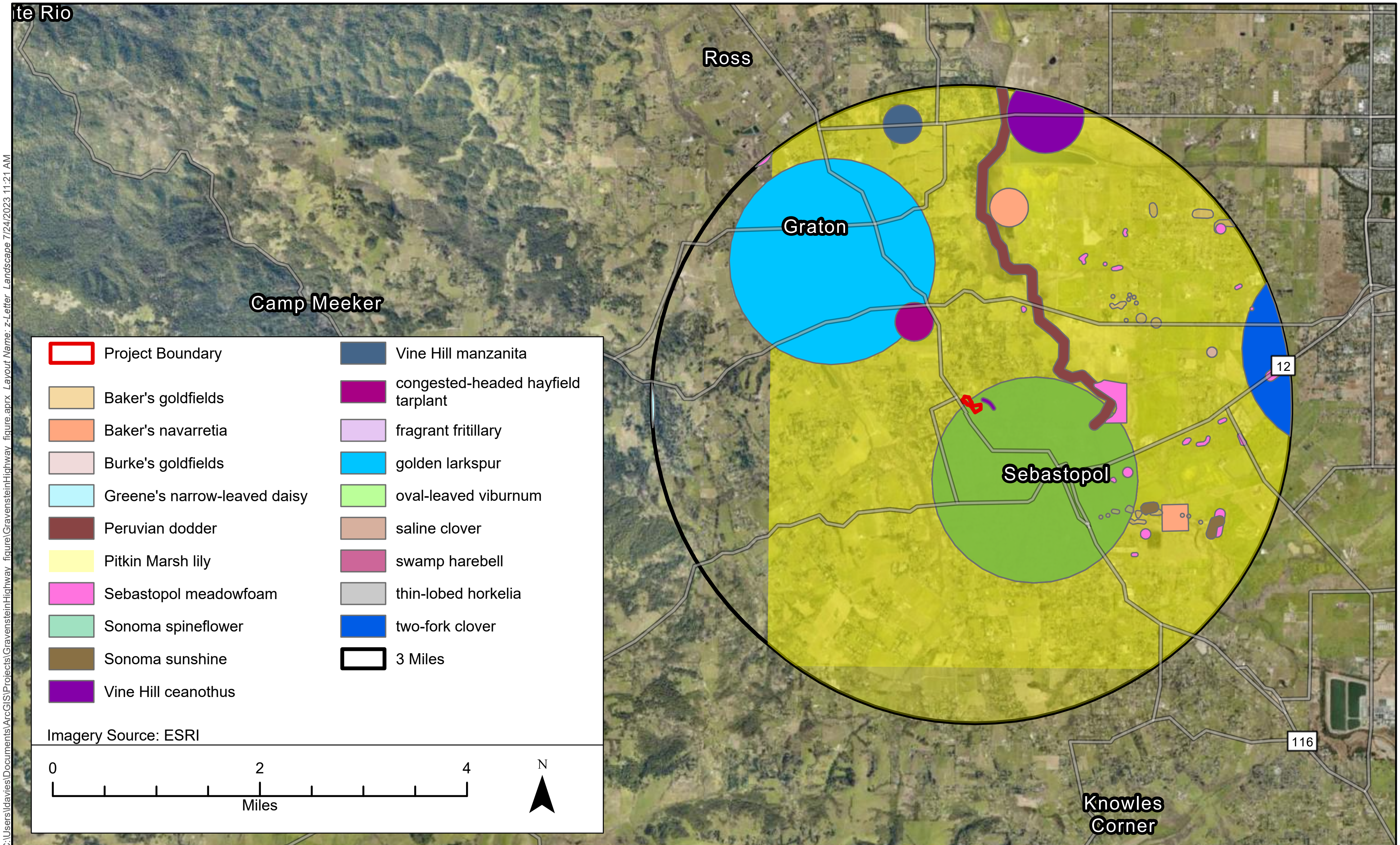
integral consulting inc.

The Canopy Project Figure 1.
Site and Vicinity Map



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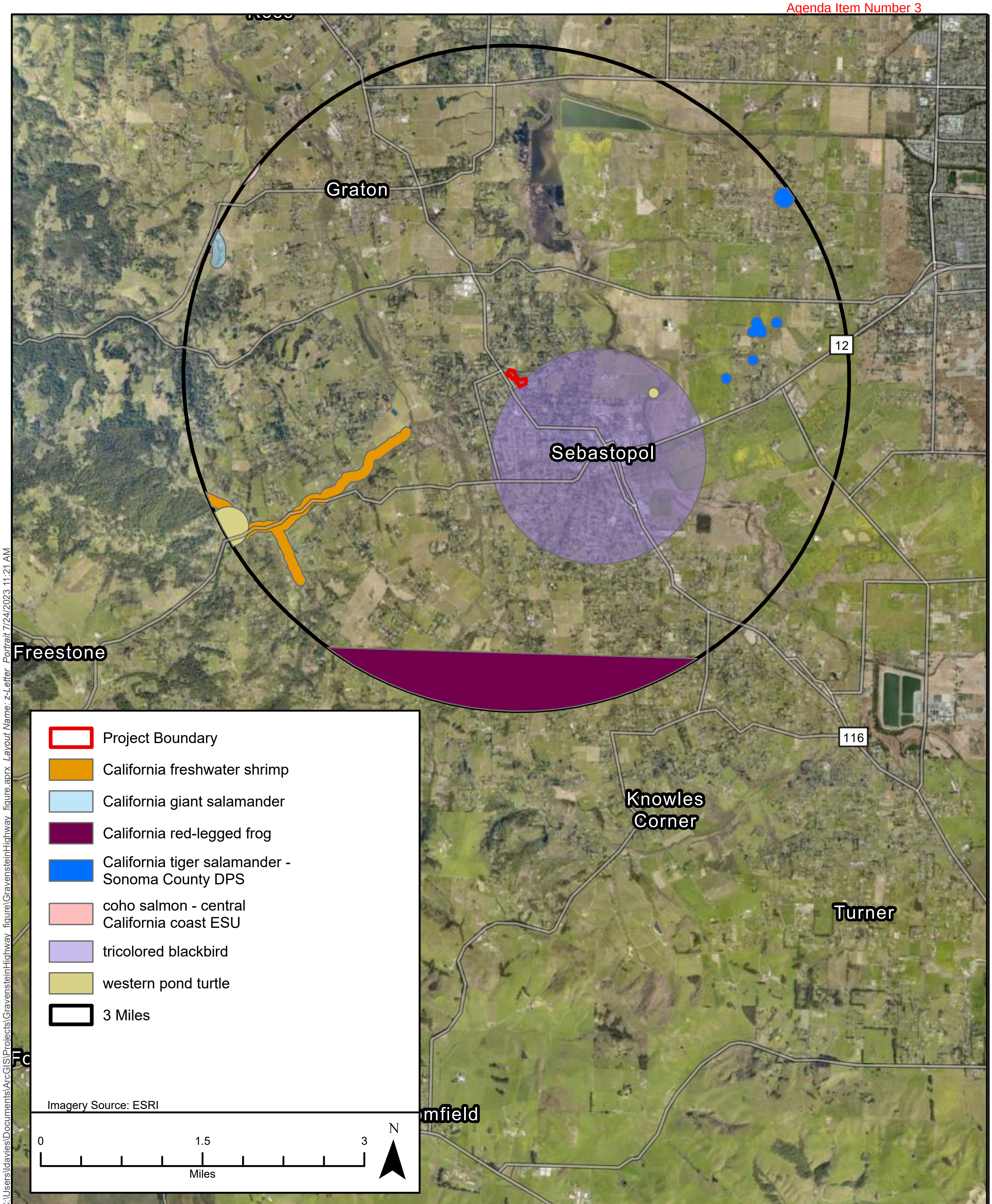
The Canopy Project Figure 2.
Rare Plants Map



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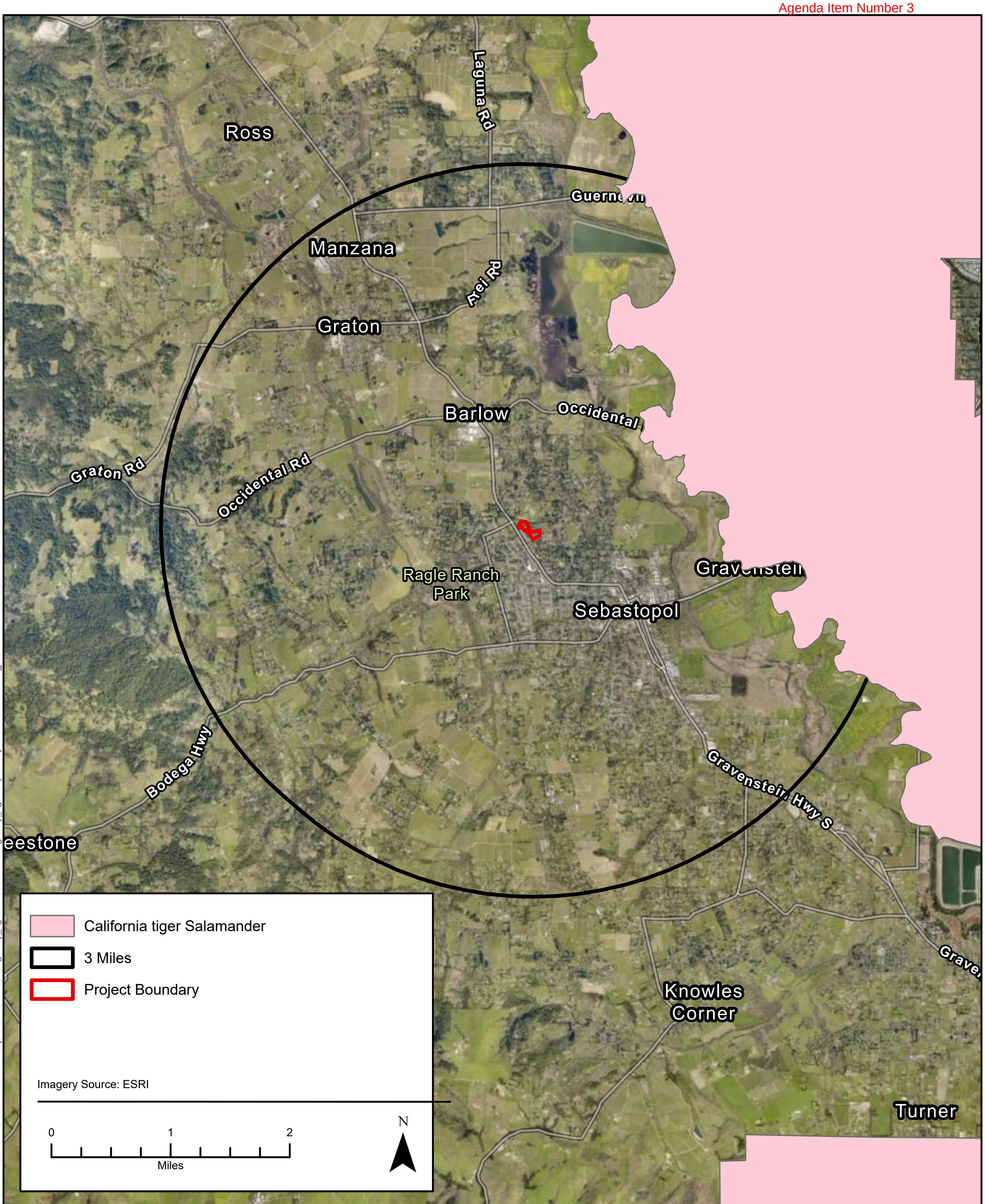
The Canopy Project Figure 3.
CNDDB Records Map



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The Canopy Project Figure 4.
Designated Critical Habitat Map

Table 1: Plants Observed on Project Site

Scientific Name	Common Name
Acacia dealbata	silver wattle
Anthemis arvensis	Corn chamomile
Atriplex prostrata	Fat-hen
Avena barbata	Slender wild oat
Bromus diandrus	Rip-gut brome
Bromus hordeaceus	Soft chess
Carduus pycnocephalus	Italian thistle
Cichorium intybus	Chicory
Convolvulus arvensis	Orchard morning glory
Daucus pusillus	Wild carrot
Elymus caput-medusae	Medusa head
Eschscholzia californica	California poppy
Erodium botrys	Big heron bill
Geranium dissectum	Cutleaf geranium
Genista monspessulana	French Broom
Helminthotheca echioides	Bristly ox-tongue
Heterotheca grandiflora	Telegraph weed
Hirschfeldia incana	Mustard
Hordeum Murinum	Foxtail barley
Hypochaeris radicata	Hairy cats ear
Lactuca saligna	Willow lettuce
Malus domestica	Apple
Medicago polymorpha	California burclover
Navarretia leptalea	Bridges pincushionplant
Phalaris aquatica	Harding grass
Plantago lanceolata	Ribwort
Pinus radiata	Monterey pine
Plantago lanceolata	Narrow leaved plantain
Prunus persica	Peach
Pseudotsuga menziesii	Douglas fir

Quercus agrifolia	Coast live oak
Raphanus sativus	Radish
Rubus armeniacus	Himalayan blackberry
Rumex crispus	Curly dock
Salvia apiana	White sage
Senegalia greggii	Devil's claw
Sequoia sempervirens	Coast redwood
Sonchus asper	Spiny sowthistle
Solanum nigrum	Black nightshade
Taraxacum officinale	Dandelion
Toxicodendron diversilobum	Poison oak
Verbascum virgatum	Wand mullein

BIOLOGICAL CONSTRAINTS ANALYSIS

1003 Gravenstein Highway

CITY OF SEBASTAPOL, SONOMA COUNTY, CALIFORNIA

May 27, 2021

Prepared by:
Johnson Marigot Consulting, LLC
433 Visitacion Ave
Brisbane, California 94005

On behalf of:
SEB, LLC
3121 Michelson Drive, Suite 150
Irvine, CA 92612

JOHNSON MARIGOT
CONSULTING, LLC

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1003 Gravenstein Highway

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INTRODUCTION

Johnson Marigot Consulting, LLC has been retained to provide a biological constraints analysis for the approximately 6.3-acre property located at 1003 Gravenstein Highway, in the City of Sebastopol, Sonoma County, California (herein referred to as the property) (Figure 1). The purpose of this report is to qualitatively identify potential occurrences and/or habitat for special-status plant and animal species on the property, and to identify local, state, and/or federal biological constraints and ordinances applicable to the development of the property.

METHODOLOGY

Prior to conducting a site visit, a literature review was conducted for special-status species known to occur in the vicinity of the property. In addition to a literature review, the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) and the California Native Plant Society (CNPS) Inventory of Rare, Threatened, and Endangered Plants of California were queried for occurrences of special-status species in the vicinity of the property (note that CNDDB occurrences that were greater than 50 years old were not considered). A list of these special-status species has been compiled in tables (Table 2 and 3) which also discuss listing/ranking status, required habitat components, proximity of records to the property, and probability of occurrence on the property.

On May 21, 2021, Johnson Marigot Consulting, LLC personnel Mr. Cameron Johnson conducted a site visit to evaluate biological resources present on the property. This site assessment included a survey of the entire property in order to characterize the vegetation, topography, and current and historic uses of the property (as well as the surrounding properties), and to investigate waters of the U.S./State. This information was used to determine the potential for the property to provide suitable habitat for special-status species (presence of habitat components necessary to support the species) and sensitive habitats.

EXISTING SITE CONDITIONS

The approximately 6.2-acre property is located on the northern boundary of the City of Sebastopol, Sonoma County, California (the approximate center of the property is at 38°41'17.26"N, 122°84'03.34"W). The property is located east of the intersection of Mill Station Road and the Gravenstein Highway. The property is bound to the north by a public trail, existing residential development, and a sports facility, to the south by an existing commercial development (including buildings and parking lots), and to the east by Hurlburt Avenue. A portion of the site (approximately 0.8-ac) is currently occupied by a community

garden site.
The property overall is relatively flat with a gentle western-facing slope, with elevations ranging from approximately 200 feet above mean sea level (AMSL) at the eastern border to approximately 190 feet AMSL at the northwestern corner of the site.

VEGETATION

The property consists of an apple orchard that is interspersed with an occasional Coast live oak tree. Trees occurring on the property include coast live oak trees (*Quercus agrifolia*) interspersed throughout the orchard, and several Douglas fir trees (*Pseudotsuga menziesii*) and Coast redwood trees (*Sequoia sempervirens*) that occur along the northern boundary of the site. The site is considered disturbed as it is maintained as an apple orchard. At the time of the site visit the site had been recently disced and mowed and there was very little understory vegetation present. A list of all observed onsite plant species is included in Table 1

RUDERAL

The edges of the property, in areas where the mowers and disks could not cover, there exist some vegetation that is dominated by species that colonize and thrive in disturbed areas, collectively referred to as ruderal species. These species may be native or non-native, but are often thought of as "weedy" species. The property is dominated by non-native herbaceous species such as bristly ox-tongue (*Helminthotheca echioides*), wild radish (*Raphanus sativus*), and hairy cat's-ear (*Hypochaeris radicata*). Lesser dominants include non-native grasses such as slender wild oats (*Avena barbata*), rip-gut brome (*Bromus diandrus*), and soft chess (*Bromus hordeaceus*).

STORMWATER BASIN

At the northwestern corner of the property (off of the property) there is an existing stormwater basin. This feature was likely constructed when the adjacent commercial project was constructed, and there is evidence that the majority of the project site, as well as commercial development and the associated parking lots, currently drain to this basin. The basin is designed to temporarily retain stormwater prior to discharge to the City stormwater system. The basin is currently vegetated almost entirely by silver wattle (*Acacia dealbata*), with some Harding grass (*Phalaris aquatica*) in the understory.

SOILS

According to the Natural Resource Conservation Service, two soil units, or types, have been mapped on the property (NRCS 2021): Goldridge fine sandy loam, 2 to 9 Percent Slopes, representing approximately 21% of the on-site soils, and Sebastopol sandy loam, 2 to 9% slopes, representing approximately 79% of the onsite soils (Figure 2).

Goldridge fine sandy loam is listed as a hydric soil on the California Hydric Soils List for Sonoma County; Sebastapol sandy loam is not a listed hydric soil.

WATERS OF THE U.S./STATE

The property appears to derive its hydrology from direct precipitation only, and is well drained. Onsite slopes are groomed and do not result in any pooling or ponding, and there are no distinct flow patterns (i.e. sheet flow only). There are existing storm drains located at the lower elevation of the site (along the northwestern boundary), and there is no evidence of any onsite waters or wetlands present.

BIOLOGICAL RESOURCE CONSTRAINTS

SPECIAL STATUS SPECIES

Special-status species include those considered to be rare by state and federal resource agencies (CDFW and the United States Fish and Wildlife Service [USFWS]) and/or the scientific community (CNPS), and are accordingly legally protected via local, state, and/or federal law. For purposes of this assessment, special-status species are defined as plants or animals protected pursuant to:

1. Federal Endangered Species Act (FESA),
2. State Endangered Species Act (CESA),
3. California Fish and Game Codes that protect nesting birds (Section 3503), raptors (Section 3503.5), and “fully protected species” (Sections 3511, 4700, 5050, and 5515)
4. Migratory Bird Treaty Act,
5. CNPS “rare” designation - all of the plants constituting California Rare Plant Rank 1A, 1B, and 2 meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 of the CESA of the California Department of Fish and Game Code, and are eligible for state listing (CNPS Inventory, 6th Edition, 2001), and/or
6. CDFW "species of special concern" (SSC) designation.

For a brief description of all special-status wildlife known to occur in the vicinity of the property, see the attached Special-Status Plant/Wildlife Species Known to Occur in the Vicinity of the 1003 Gravenstein Highway Property tables (Tables 2 and 3).

PLANTS

According to the CNDDB and the CNPS Inventory of Rare, Threatened, and Endangered Plants of California, a total of 12 records for special-status plant species occur in the vicinity of the property (within 3 miles of the property and/or on the same U.S. Geological Survey (USGS) 7.5' topographic quadrangle (quad) (Sebastopol quad), or the adjacent quads (Table 2). Protocol-level rare plant surveys were not conducted on the property, and none were observed during the site visit.

The California Natural Diversity Database shows records for three federally-listed species within 2-miles of the Project Site; of these, there are two plants (Burke's goldfields and Sebastopol meadowfoam) and one animal (California freshwater shrimp). There is no habitat for any of these species present on the project site (Figure 3).

The site does not contain any wetlands, and it is routinely disked and mowed as an orchard; none of these special-status plants are expected to occur on the property.

WILDLIFE

State and Federally Listed Wildlife

While no special-status wildlife species have been recorded on the property, due to the site's location and its proximity to open spaces and agricultural fields, nine special-status wildlife species are known to occur, or have the potential to occur within 3 miles of the property: tri-colored blackbird (*Agelaius tricolor*), California tiger salamander (*Ambystoma californiense*), burrowing owl (*Athene cunicularia*), white-tailed kite (*Elanus lecurus*), western pond turtle (*Emys marmorata*), steelhead - Central California Coast DPS (*Oncorhynchus mykiss* ssp. *irideus*), foothill yellow-legged frog (*Rana boylii*), California red-legged frog (*Rana draytonii*), and California freshwater shrimp (*Syncaris pacifica*) (Table 3). Eight of these species require specialized habitats that do not occur on the property such as emergent wetlands with tall dense vegetation (tri-colored blackbird), ponds (California tiger salamander) permanent/nearly-permanent waters (western pond turtle, steelhead, California freshwater shrimp), rocky streams (foothill yellow-legged frog, California red-legged frog), and open grasslands with ground squirrel burrows (burrowing owl, California tiger salamander).

The California Natural Diversity Database shows records for three federally-listed species within 2-miles of the Project Site; of these, there are two plants (Burke's goldfields and Sebastopol meadowfoam) and one animal (California freshwater shrimp). There is no habitat for any of these species present on the project site (Figure 3). The Project site is not within designated Critical Habitat for any listed species, nor does it contain suitable habitat for any listed species (Figure 4).

The property does provide suitable nesting habitat for one of the regionally-known special-status species: white-tailed kite (CDFW fully protected species). The coast live oak, fir, and redwood trees on the property provide suitable nesting habitat and there are suitable grasslands north of the site that provide suitable foraging habitat for the white-tailed kite. As such, in the absence of protocol-level surveys for these species, their presence on the property cannot be ruled out.

Nesting Birds

The trees and orchard that occur on and adjacent to the property provide suitable nesting habitat for many species of passerine (perching) birds and raptors (birds of prey) known to occur in the vicinity of the property. No nests were observed in the trees or grassland on or adjacent to the property during the site assessment, however, owing to the mobile nature of birds and the seasonality of their nesting cycle, this does not mean that birds will not nest onsite at a future date.

TREES

Pursuant to City of Sebastopol Code of Ordinances Chapter 8.12 (Tree Protection), the alteration, removal, or relocation of the onsite trees requires a tree removal permit. As such, if the development of the property requires the removal of the coast live oak and/or the Coast redwood trees on the property, a tree removal permit from the City of Sebastopol will likely be required.

WATERS OF THE U.S./STATE

The Project site does not contain any regulated waters of the U.S., or waters of the State California.

CONCLUSIONS AND RECOMMENDATIONS

While the property is fairly disturbed, it does provide suitable habitat for one regionally known special-status species: white-tailed kite. Due to the presence of suitable nesting habitat for white-tailed kite on the property, if work is scheduled to commence during the nesting season (February 1 through August 30), impacts to this species cannot be ruled out in the absence of nesting bird surveys. Similarly, due to the presence of trees (including the existing orchard trees) that provide suitable nesting habitat for more common, yet still protected, avian species, impacts to these species cannot be ruled out in the absence of nesting bird surveys. *A preconstruction survey should be conducted of all suitable nesting habitat prior to the commencement of vegetation removal/ground disturbance, if such work is scheduled to commence during the nesting season*.

On-site Coast live oaks and Coast redwood trees are subject to the City of Sebastopol' tree preservation ordinance. Prior to removal of any on-site trees, all on-site Coast live oaks and Coast redwoods should be identified and mapped, and a Tree Protection Plan and Tree Removal Permit will be required by the City for removal of any of these trees that are inconsistent with on-site development.

Table 1. Plants Observed at 1003 Gravenstein Highway

Scientific Name	Common Name
Acacia dealbata	silver wattle
Avena barbata	Slender wild oat
Bromus diandrus	Rip-gut brome
Bromus hordeaceus	Soft chess
Carduus pycnocephalus	Italian thistle
Cichorium intybus	Chicory
Convolvulus arvensis	Orchard morning glory
Elymus caput-medusae	Medusa head
Geranium dissectum	Cutleaf geranium
Helminthotheca echioides	Bristly ox-tongue
Hypochaeris radicata	Hairy catsear
Lactuca serriola	Prickly wild lettuce
Malus domestica	Apple
Phalaris aquatica	Harding grass
Pinus radiata	Monterey pine
Plantago lanceolata	Narrow leaved plantain
Pseudotsuga menziesii	Douglas fir
Quercus agrifolia	Coast live oak
Raphanus sativus	Radish
Rubus armeniacus	Himalayan blackberry
Sequoia sempervirens	Coast redwood
Taraxacum officinale	Dandelion

Table 2. Special-Status Plant Species Known to Occur in the Vicinity of 1003 Gravenstein Highway

Common Name	ScientificName	Status	Occurrence Information	Habitat	Probability of Occurring on the Project Site	Blooming Period
Clara Hunt's milk-vetch	***Astragalus claranus***	Federally Endangered State Threatened CNPS 1B.1	known to occur within the 8 adjacent Quads	Chaparral, Cismontane woodland, Valley and foothill grassland	None. The Project Site is farmed and management methods render the site as unsuitable habitat for this species.	Mar-May
Sonoma sunshine	***Blennosperma bakeri***	Federally Endangered State Endangered CNPS 1B.1	known to occur in the Sebastopol Quad	Valley and foothill grassland, Vernal pools	None. The Project Site does not provide suitable habitat for this species.	Mar-May
Vine Hill ceanothus	***Cenothus foliosus var. vineatus***	CNPS 1 B.1	known to occur in the Sebastopol Quad	Chaparral	None. The Project Site is farmed and management methods render the site as unsuitable habitat for this species.	Mar-May
Sonoma spineflower	***Chorizanthe valida***	Federally Endangered State Endangered CNPS 1B.1	known to occur in the Sebastopol Quad	Coastal prairie	None. The Project Site is farmed and management methods render the site as unsuitable habitat for this species.	Jun-Aug
Vine Hill clarkia	***Clarkia imbricata***	Federally Endangered State Endangered CNPS 1B.1	known to occur in the Sebastopol Quad	Chaparral, Valley and foothill grassland	None. The Project Site is farmed and management methods render the site as unsuitable habitat for this species.	Jun-Aug
Pennell's bird's-beak	***Cordylanthus tenuis ssp. capillaris***	Federally Endangered CNPS 1B.2	known to occur within the 8 adjacent Quads	Chaparral, Closed-cone coniferous forest	None. The Project Site does not provide suitable habitat for this species.	Jun-Sep
Baker's larkspur	***Delphinium bakeri***	Federally Endangered State Endangered CNPS 1B.1	known to occur within the 8 adjacent Quads	Broadleafed upland forest, Coastal scrub, Valley and foothill grassland	None. The Project Site is farmed and management methods render the site as unsuitable habitat for this species.	Mar-May
golden larkspur	***Delphinium luteum***	Federally Endangered CNPS 1B.1	known to occur in the Sebastopol Quad	Chaparral, Coastal prairie, Coastal scrub	None. The Project Site is farmed and management methods render the site as unsuitable habitat for this species.	Mar-May
Burke's goldfields	***Lasthenia burkei***	Federally Endangered State Endangered CNPS 1B.1	known to occur in the Sebastopol Quad	Meadows and seeps, Vernal pools	None. The Project Site does not provide suitable habitat for this species.	Apr-Jun
Pitkin Marsh lily	***Lilium pardalinum ssp. pitkinense***	Federally Endangered State Endangered CNPS 1B.1	known to occur in the Sebastopol Quad	Cismontane woodland, Marshes and swamps, Meadows and seeps	None. The Project Site does not provide suitable habitat for this species.	Jun-Jul
Sebastopol meadowfoam	***Limnanthes vinculans***	Federally Endangered State Endangered CNPS 1B.1	known to occur in the Sebastopol Quad	Meadows and seeps, Valley and foothill grassland, Vernal pools	None. The Project Site does not provide suitable habitat for this species.	Apr-May
many-flowered navarretia	***Navarretia leucocephala ssp. plieantha***	Federally Endangered State Endangered CNPS 1B.2	known to occur in the Sebastopol Quad	Vernal pools	None. The Project Site does not provide suitable habitat for this species.	May-Jun

Table 3. Special-Status Wildlife Species Known to Occur in the Vicinity of 1003 Gravenstein Highway

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Tri-colored Blackbird	***Agelaius tricolor***	State Candidate Endangered	Nests in emergent wetland with tall, dense cattails or tules, or thickets of willow, blackberry, or tall herbs	known to occur in the Sebastopol Quad	**None.** No suitable habitat occurs on or near the Project Site.
California Tiger Salamander	***Ambystoma californiense***	Federally Threatened State Threatened	Grasslands adjacent to seasonal wetlands and ponds	The closest record for this species occurs approximately 1.7 mile east of the Project SIte (CNDDB Occurrence No. 937).	**None.** No suitable habitat occurs on or near the Project Site.
Burrowing Owl	***Athene cunicularia***	California Species of Concern	Open, dry grassland and desert habitats, and in grass, forb and open shrub habitats with ground squirrel burrows	The closest record for this species occurs greater than 3-miles from the Project Site.	**None.** No suitable habitat was observed on the property. *Preconstruction nesting surveys should be conducted.*
White-tailed Kite	***Elanus leucurus***	California Fully Protected	Forages in grasslands Nests in trees with dense canopy	The closest record for this species occurs greater than 3-miles from the Project Site. However, this species is known to occur regionally and on-site trees represent potential nesting habitat.	**Moderate.** The project site provides suitable nesting habitat for this species. *Preconstruction nesting surveys should be conducted.*
Western Pond Turtle	***Emys marmorata***	California Species of Concern	A variety of habitats adjacent to permanent or nearly permanent water	The closest record for this species occurs approximately 1.0 miles east of the Project site (CNDDB Occurrence No. 682).	**None.** No suitable habitat occurs on or near the Project Site.
steelhead - Central California Coast DPS	***Oncorhynchus mykiss***	Federally Threatened	Freshwater streams with well developed riparian canopy	Critical Habitat approx 1-mile south of project site Jonive Creek	**None.** No suitable habitat occurs on or near the Project Site.
Foothill Yellow-legged Frog	***Rana boylii***	California Species of Concern	In or near rocky streams in a variety of habitats	The closest record for this species occurs approximately 3.9 mile southwest of the Project Site (CNDDB Occurrence No. 1835).	**None.** No suitable habitat occurs on or near the Project Site.
California Red-Legged Frog	***Rana draytonii***	Federally Threatened California Species of Concern	Grassland and riparian habitats adjacent to creeks/streams with plunge pools or ponds	The closest record for this species occurs greater than 3-miles from the Project Site.	**None.** No suitable habitat occurs on or near the Project Site.
California freshwater shrimp	***Syncaris pacifica***	Federally Endangered California Endangered	Freshwater streams with well developed riparian canopy	The closest record of this species is in Jonive Creek approx 1-mile from the Project Site (CNDDB Occurrence No. 9)	**None.** No suitable habitat occurs on or near the Project Site.


1003 GravensteinHwy
Sebastopol, CA
Legend
Approximate Boundary
116
W County & Rodota Trails
E Hurlbut Ave
Winona Ln
Gravenstein Hwy N
Hurlbut Ave
Norlee St
Google Earth
© 2018 Google
600 ft
N

Soil Map—Sonoma County, California
(NRCS Soils)

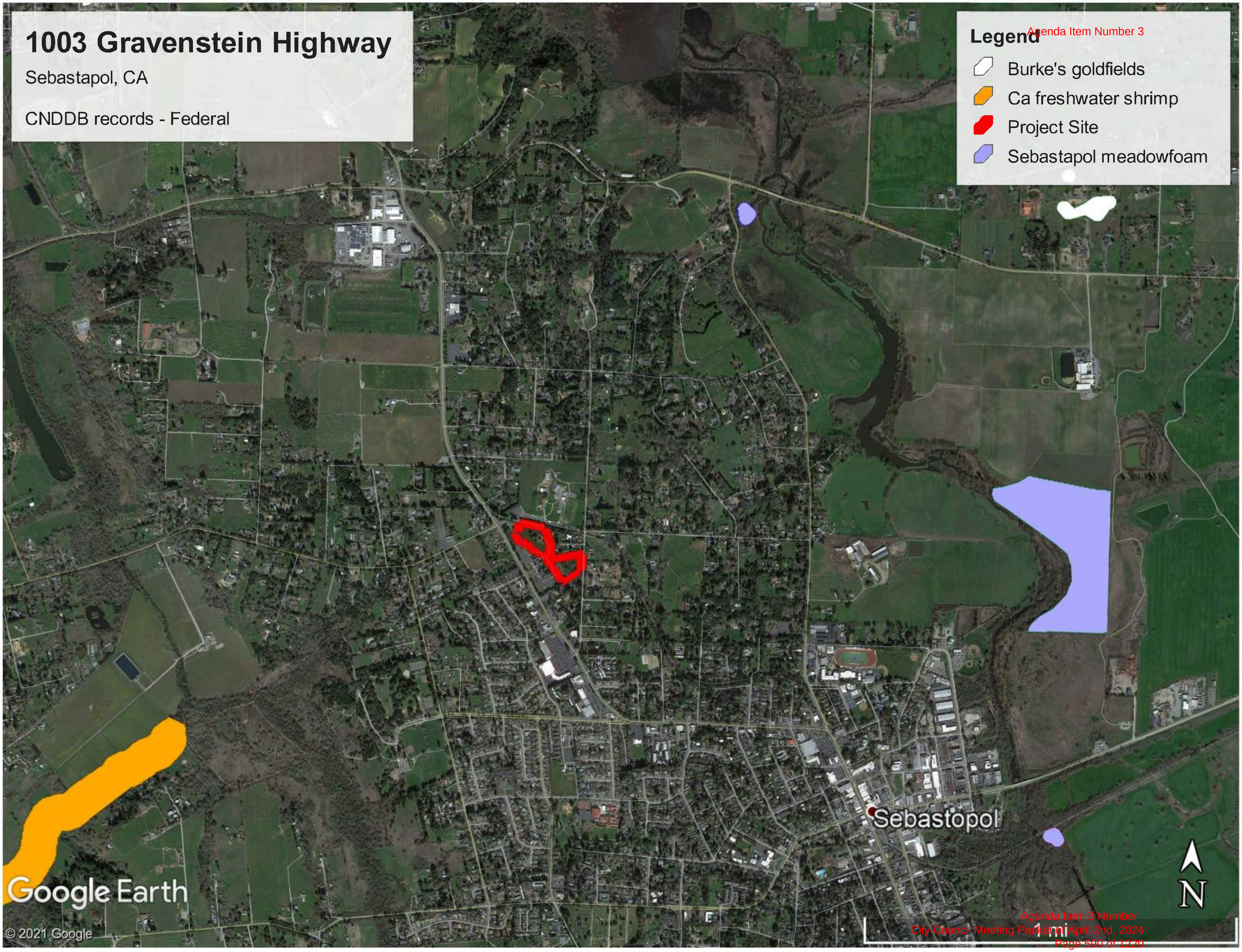
Map Scale: 1:2,150 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 30, 60, 120, 180

Feet: 0, 100, 200, 400, 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84


1003 Gravenstein Highway
Sebastapol, CA
CNDDB records - Federal
Legend
Burke's goldfields
Ca freshwater shrimp
Project Site
Sebastapol meadowfoam
Sebastopol
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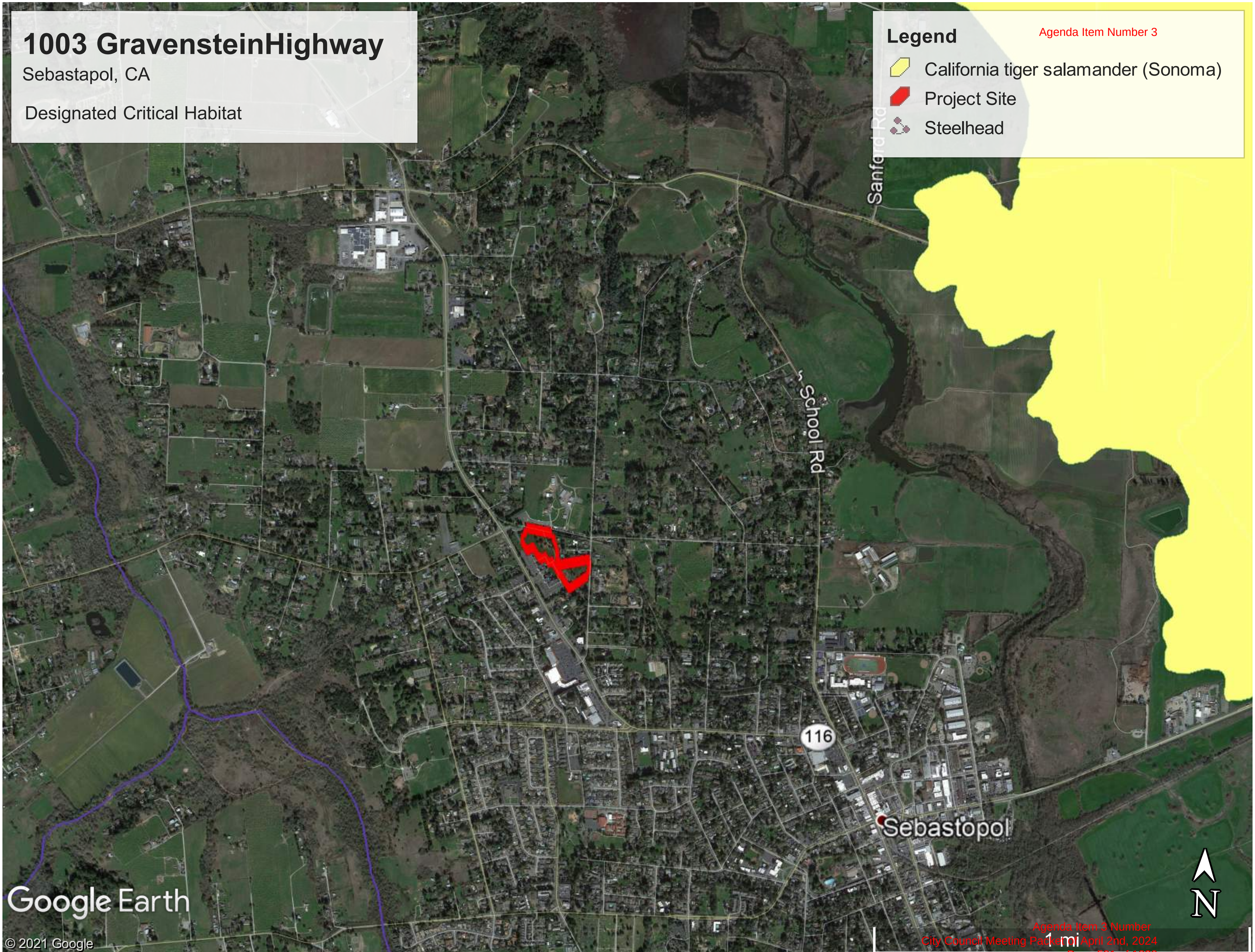
1003 GravensteinHighway
Sebastapol, CA
Designated Critical Habitat
Legend
California tiger salamander (Sonoma)
Project Site
Steelhead
Sanford Rd
School Rd
116
Sebastopol
Google Earth
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Appendix D

Tree Inventory Reports

HORTICULTURAL Associates
Consultants in Horticulture and Arboriculture
P.O Box 1261, Glen Ellen, CA 95442

October 25, 2022

Samantha Hauser
City Ventures
444 Spear Street, Suite 200
San Francisco, CA 94105

Re: Review of current Tree Preservation Plan; Gravenstein Highway, Sebastopol, California

Samantha,

I reviewed the latest set of project plans with regard to the preservation of existing trees at your Sebastopol project and I am providing the following observations and recommendations for your review:

1. The plan reviewed is attached. Trees highlighted in green are currently designated for preservation and trees highlighted in red are currently designated for removal.

2. I have been working with the design team to preserve as many trees as possible and the site plan has been modified several times toward this goal.

3. The larger and more visually significant trees are being preserved, including several Oaks located in interior areas of the site.

4. Most perimeter trees are being preserved and these will continue to function effectively as screening to the adjacent neighborhoods.

5. Grading details are still being worked out and trees designated for preservation are front and center in grading design. Minimal to no cut grading will be occurring in canopy driplines. Placement of minor fill within driplines will be necessary in some areas as part of pesticide residue mitigation measures. Details and specifications for this process will be determined as more information becomes available. The project arborist will be involved in preparation of these details.

6. Bike and walk paths in perimeter areas where trees are being preserved will be placed on grade and will meander around trees to the greatest extent possible. We are still working on these details.

~ Voice 707-935-3911 Fax 707-935-7103 ~

7. Design work completed to date has given the protection and preservation of trees a high priority. The plan currently under consideration acceptably protects the trees designation for preservation.

Please feel free to contact me if you have questions regarding this letter, or if further discussion would be helpful.

Regards,

John C. Meserve
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor/TRAQ
ASCA Qualified Tree and Plant Appraiser/TPAQ

HORTICULTURAL Associates

Consultants in Horticulture and Arboriculture

TREE PRESERVATION AND MITIGATION REPORT

Sebastopol A Project
Sebastopol, CA

Prepared For:

City Ventures
444 Spear Street, Suite 200
San Francisco, CA 94105

Prepared by:

John C. Meserve
International Society of Arboriculture
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor

April 10, 2019

HORTICULTURAL Associates
Consultants in Horticulture and Arboriculture
P.O Box 1261, Glen Ellen, CA 95442

April 10, 2019

Samantha Hauser
Director of Development
City Ventures
444 Spear Street, Suite 200
San Francisco, CA 94105

Re: Partial *Tree Preservation and Mitigation Report*, Sebastopol A Project, Sebastopol, California

Samantha,

Attached you will find our partial *Tree Preservation and Mitigation Report* for the above noted site in Sebastopol. A total of 132 trees were evaluated, and this includes all protected trees over 10 inches in trunk diameter and non-protected trees between 6 and 9 inches in diameter.

The Sebastopol Tree Ordinance requires protected trees 10 inches and greater to be included in an Arborist Report. We have also included trees 6 inches to 9 inches to be thorough. Trees of this smaller size are not protected, and 42 of the 132 in this report are in this smaller size category.

There are a number of large Acacias at the site, and this species was also not included in our Inventory because it is included on the Sebastopol 'escaped exotic' list and does not require retention.

This site is a remnant apple orchard which originated in the early 1900's, according to CEQA documents prepared in the late 1990's. Apples are also not a protected species, and most are generally over-mature, declining, decayed, or dying back. No apples were included in this inventory.

Each tree is identified in the field with a numbered aluminum tag placed on the trunk at approximately eye level.

All trees in this report were evaluated and documented for species, size, health, and structural condition. The *Tree Inventory Chart* does not include information about expected impacts of future development, or recommendations for action, because no solid plan has been developed yet.

The *Tree Location Plan* shows the location and numbering sequence of all evaluated trees. Protected trees are shown with white numbers and smaller non-protected trees are shown in a lighter shade.

~ Voice 707-935-3911 Fax 707-935-7103 ~

EXISTING SITE CONDITION SUMMARY

The project site consists of an abandoned apple orchard, bordered on one side by a walking path, three sides by residential development, one side by a City street, and one side by commercial development.

EXISTING TREE SUMMARY

Native species present include Coast Live Oak, Black Oak, Douglas Fir, and Valley Oak.

California native species that have been planted as ornamentals include Coast Redwood, White Alder, and Incense Cedar.

Non-native species other than Acacia and Apple include Honey Locust, Pine, Deodar Cedar, and Elm.

Some large off-site trees that overhang the site were also included in this inventory.

CONSTRUCTION IMPACT SUMMARY

No construction impact analysis is included in this study. When you have determined a final development plan we will provide an impact study for you then.

Please feel free to contact me if you have questions regarding this report, or if further discussion would be helpful.

Regards,

John C. Meserve
Consulting Arborist and Horticulturist
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor

TREE INVENTORY CHART

TREE INVENTORY
Sebastopol A Project
Sebastopol, CA

April 10, 2019

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
1	*Quercus agrifolia*	Coast Live Oak	7+9	18	12	4	3			
2	*Quercus agrifolia*	Coast Live Oak	8.5+multiple	20	20	4	3			
3	*Quercus agrifolia*	Coast Live Oak	10.5+13	25	20	4	3			
4	*Quercus agrifolia*	Coast Live Oak	20.5	35	20	4	3			
5	*Quercus agrifolia*	Coast Live Oak	7.5+5+4+4	15	9	4	3			
6	*Quercus agrifolia*	Coast Live Oak	11.5+10+7.5+8	20	18	4	3			
7	*Quercus agrifolia*	Coast Live Oak	6+multiple	15	14	4	3			
8	*Quercus agrifolia*	Coast Live Oak	8.5	15	12	3	3			
9	*Quercus lobata*	Valley Oak	13	40	20	4	3			
10	*Quercus kelloggi*	Black Oak	13+10	30	22	4	3			
11	*Quercus agrifolia*	Coast Live Oak	13+14.5	35	24	4	2	Already braced		
12	*Sequoia sempervirens*	Coast Redwood	14.5	35	14	4	3			
13	*Quercus agrifolia*	Coast Live Oak	16	25	18	4	3			
14	*Sequoia sempervirens*	Coast Redwood	12	25	10	4	3			

TREE INVENTORY
Sebastopol A Project
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
15	*Sequoia sempervirens*	Coast Redwood	15	35	11	4	3			
16	*Sequoia sempervirens*	Coast Redwood	14.5	35	10	4	3			
17	*Sequoia sempervirens*	Coast Redwood	16	35	11	4	3			
18	*Quercus agrifolia*	Coast Live Oak	8	20	12	4	3			
19	*Sequoia sempervirens*	Coast Redwood	8	25	9	4	3			
20	*Sequoia sempervirens*	Coast Redwood	11.5	35	12	4	3			
21	*Pseudotsuga menziesii*	Douglas-fir	±24	60	22	3	3			
22	*Quercus agrifolia*	Coast Live Oak	9	12	9	3	3	Drought stressed in past, good new growth this season		
23	*Quercus agrifolia*	Coast Live Oak	11.5	16	12	3	3	Drought stressed in past, good new growth this season		
24	*Pseudotsuga menziesii*	Douglas-fir	8.5	22	10	3	3			
25	*Quercus agrifolia*	Coast Live Oak	10	15	11	3	3	Drought stressed in past, good new growth this season		
26	*Quercus kelloggi*	Black Oak	7+7	18	13	4	3			
27	*Quercus agrifolia*	Coast Live Oak	8+7.5	18	14	3	3			
28	*Pseudotsuga menziesii*	Douglas-fir	8	30	11	4-3	3			

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
29	*Quercus agrifolia*	Coast Live Oak	11.5	18	14	3	3	Drought stressed in past, good new growth this season		
30	*Sequoia sempervirens*	Coast Redwood	15	35	11	4	3			
31	*Sequoia sempervirens*	Coast Redwood	11	30	10	4	3			
32	*Sequoia sempervirens*	Coast Redwood	14.5	35	12	4	3			
33	*Sequoia sempervirens*	Coast Redwood	16	38	13	4	3			
34	*Pseudotsuga menziesii*	Douglas-fir	7	22	9	3	3			
35	*Pseudotsuga menziesii*	Douglas-fir	9	20	9	3	3			
36	*Sequoia sempervirens*	Coast Redwood	17	3	11					
37	*Sequoia sempervirens*	Coast Redwood	15	4	11	4	3			
38	*Sequoia sempervirens*	Coast Redwood	15	35	11	4	3			
39	*Sequoia sempervirens*	Coast Redwood	14	35	10	4	3			
40	*Sequoia sempervirens*	Coast Redwood	16	40	12	4	3			
41	*Sequoia sempervirens*	Coast Redwood	13	35	10	4	3			
42	*Sequoia sempervirens*	Coast Redwood	15.5	35	11	4	3			

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
43	*Sequoia sempervirens*	Coast Redwood	16	40	11	4	3			
44	*Quercus agrifolia*	Coast Live Oak	14+7.5	25	18	4	3			
45	*Sequoia sempervirens*	Coast Redwood	14	30	10	4	3			
46	*Sequoia sempervirens*	Coast Redwood	14	35	12	4	3			
47	*Quercus agrifolia*	Coast Live Oak	28	45	24	4	3	Co-dominant trunks		
48	*Quercus lobata*	Valley Oak	7+5+2.5	18	11	4	3			
49	*Quercus agrifolia*	Coast Live Oak	±6+8+8	25	16	4	3			
50	*Quercus agrifolia*	Coast Live Oak	7.5+6+6.5+6	20	11	4	3			
51	*Sequoia sempervirens*	Coast Redwood	12	35	11	4	3			
52	*Sequoia sempervirens*	Coast Redwood	13.5	38	12	4	3			
53	*Sequoia sempervirens*	Coast Redwood	15.5	35	12	4	3			
54	*Sequoia sempervirens*	Coast Redwood	14	35	12	4	3			
55	*Sequoia sempervirens*	Coast Redwood	12	30	10	4	3			
56	*Quercus agrifolia*	Coast Live Oak	11.5	20	14	3	3			

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
57	*Sequoia sempervirens*	Coast Redwood	15	35	12	4	3			
58	*Sequoia sempervirens*	Coast Redwood	16	35	12	4	3			
59	*Sequoia sempervirens*	Coast Redwood	15.5	35	12	4	3			
60	*Sequoia sempervirens*	Coast Redwood	12.5	30	10	4	3			
61	*Sequoia sempervirens*	Coast Redwood	16.5	38	14	4	3			
62	*Quercus agrifolia*	Coast Live Oak	9+7.5	22	13	4	3			
63	*Pseudotsuga menziesii*	Douglas-fir	11	30	16	4	3			
64	*Pseudotsuga menziesii*	Douglas-fir	11.5	35	11	4	3			
65	*Quercus agrifolia*	Coast Live Oak	9	16	12	4	3			
66	*Quercus agrifolia*	Coast Live Oak	14.5	20	17	4	3			
67	*Quercus agrifolia*	Coast Live Oak	11	20	16	4	3			
68	*Sequoia sempervirens*	Coast Redwood	14.5	30	11	4	3			
69	*Sequoia sempervirens*	Coast Redwood	12.5	30	10	4	3			
70	*Sequoia sempervirens*	Coast Redwood	13	35	10	4	3			

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)		Special Notes	Expected Impact	Recommendations
71	*Sequoia sempervirens*	Coast Redwood	11.5	30	9	4	3			
72	*Sequoia sempervirens*	Coast Redwood	9	25	9	4	3			
73	*Sequoia sempervirens*	Coast Redwood	9	26	9	4	3			
74	*Sequoia sempervirens*	Coast Redwood	8	20	8	4	3			
75	*Sequoia sempervirens*	Coast Redwood	6+8.5	25	8	4	3			
76	*Quercus agrifolia*	Coast Live Oak	23	40	26	4	3			
77	*Quercus agrifolia*	Coast Live Oak	26	60	26	3	3			
78	*Quercus agrifolia*	Coast Live Oak	13+11+18.5+12.5+11.5	35	26	3	3			
79	*Sequoia sempervirens*	Coast Redwood	8.5	22	9	4	3			
80	*Quercus agrifolia*	Coast Live Oak	8+8.5	20	25	3	3			
81	*Quercus agrifolia*	Coast Live Oak	8+16.5+12+14+15	50	25	3	3	Co-dominant trunks		
82	*Quercus agrifolia*	Coast Live Oak	16	30	27	4	3			
83	*Quercus agrifolia*	Coast Live Oak	22+12+22.5	50	27	3	3	Co-dominant trunks, included bark, anthracnose infection		
84	*Pseudotsuga menziesii*	Douglas-fir	7	20	6	3	3			

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
85	*Quercus agrifolia*	Coast Live Oak	15.5+14.5+15	40	25	3	3			
86	*Sequoia sempervirens*	Coast Redwood	15	35	12	4	3			
87	*Sequoia sempervirens*	Coast Redwood	11	30	10	4	3			
88	*Sequoia sempervirens*	Coast Redwood	13	35	12	4	3			
89	*Quercus agrifolia*	Coast Live Oak	7.5+10+6+6	25	16	3	3			
90	*Quercus agrifolia*	Coast Live Oak	±8	18	12	3	3			
91	*Quercus agrifolia*	Coast Live Oak	10.5+18	20	19	4	3			
92	*Quercus agrifolia*	Coast Live Oak	15+10+5+11	25	18	3	3			
93	*Pseudotsuga menziesii*	Douglas-fir	11.5	30	11	4	3			
94	*Pseudotsuga menziesii*	Douglas-fir	10.5	30	11	3	3			
95	*Quercus agrifolia*	Coast Live Oak	14+18	25	14	4	3			
96	*Quercus agrifolia*	Coast Live Oak	7	18	10	4	3			
97	*Quercus agrifolia*	Coast Live Oak	12	28	20	3	3			
98	*Quercus agrifolia*	Coast Live Oak	18.5	30	22	4	3			

TREE INVENTORY
Sebastopol A Project
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
99	*Quercus agrifolia*	Coast Live Oak	14.5+11	30	18	3	3			
100	*Quercus agrifolia*	Coast Live Oak	6+8.5	20	18	4	3			
101	*Quercus agrifolia*	Coast Live Oak	11+11+6	30	18	4	3			
102	*Quercus agrifolia*	Coast Live Oak	10+13.5+12+9+ 13	28	24	4	3			
103	*Quercus agrifolia*	Coast Live Oak	8+multiple	18	16	4	3			
104	*Quercus agrifolia*	Coast Live Oak	6+6+5+4+5	18	12	4	3			
105	*Quercus agrifolia*	Coast Live Oak	9+10+multiple	25	18	4	3			
106	*Quercus agrifolia*	Coast Live Oak	8.5	20	16	4	3			
107	*Quercus agrifolia*	Coast Live Oak	14+12.5	30	16	4	3			
108	*Quercus agrifolia*	Coast Live Oak	30	30	20	4	3			
109	*Quercus agrifolia*	Coast Live Oak	18+29	30	25	3	3	Co-dominant trunks, included bark, anthracnose infection		
110	*Pseudotsuga menziesii*	Douglas-fir	8	20	6	4	3			
111	*Gleditsia triacanthos*	Honey Locust	14	38	22	3	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
112	*Pinus sp.*	Pine	18	60	18	2	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
113	*Pinus sp.*	Pine	16	60	18	3	2	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
114	*Cedrus deodara*	Deodar Cedar	22	50	22	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
115	*Cedrus deodara*	Deodar Cedar	26	60	26	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
116	*Calocedrus decurrens*	Incense Cedar	9	18	7	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
117	*Salix matsudana "Tortuosa"*	Curly willow	14+ mulitiple	30	20	2	2	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
118	*Gleditsia triacanthos*	Honey Locust	8	18	18	3	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
119	*Pinus radiata*	Monterey pine	30+ multiple	80	35	4	2	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
120	*Ulmus americana*	American Elm	20	25	14	3	2	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
121	*Sequoia sempervirens*	Coast Redwood	32	50	17	4	2	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
122	*Sequoia sempervirens*	Coast Redwood	9	30	10	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
123	*Cedrus deodara*	Deodar Cedar	9	30	12	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
124	*Sequoia sempervirens*	Coast Redwood	33	60	18	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
125	*Sequoia sempervirens*	Coast Redwood	36	60	18	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
126	*Cedrus deodara*	Deodar cedar	14	45	15	3	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		

TREE INVENTORY
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Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
127	*Alnus rhombifolia*	Alder	10	18	8	2	2	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
128	*Alnus rhombifolia*	Alder	7	18	5	2	1	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
129	*Sequoia sempervirens*	Coast Redwood	13	25	10	4	3			
130	*Pseudotsuga menziesii*	Douglas-fir	6	16	10	3	3			
131	*Pseudotsuga menziesii*	Douglas-fir	7	15	9	3	3			
132	*Pseudotsuga menziesii*	Douglas-fir	8	16	10	3	3			

KEY TO TREE INVENTORY CHART

KEY TO TREE INVENTORY CHART

Tree Number

Each tree has been identified in the field with an aluminum tag and reference number. Tags are attached to the trunk at approximately eye level. The *Tree Location Plan* illustrates the location of each numbered tree.

Species

Each tree has been identified by genus, species and common name. Many species have more than one common name.

Trunk

Each trunk has been measured or estimated, in inches, to document its diameter, at 4.5 feet above adjacent grade. Trunk diameter is a good indicator of age, and is commonly used to determine mitigation replacement requirements.

Height

Height is estimated in feet, using visual assessment.

Radius

Radius is estimated in feet, using visual assessment. Since many canopies are asymmetrical, it is not uncommon for a radius estimate to be an average of the canopy size.

Health

The following descriptions are used to rate the health of a tree. Trees with a rating of 4 or 5 are very good candidates for preservation and will tolerate more construction impacts than trees in poorer condition. Trees with a rating of 3 may or may not be good candidates for preservation, depending on the species and expected construction impacts. Trees with a rating of 1 or 2 are generally poor candidates for preservation.

(5) Excellent - health and vigor are exceptional, no pest, disease, or distress symptoms.

(4) Good - health and vigor are average, no significant or specific distress symptoms, no significant pest or disease.

(3) Fair - health and vigor are somewhat compromised, distress is visible, pest or disease may be present and affecting health, problems are generally correctable.

(2) Marginal - health and vigor are significantly compromised, distress is highly visible and present to the degree that survivability is in question.

(1) Poor - decline has progressed beyond the point of being able to return to a healthy condition again. Long-term survival is not expected. This designation includes dead trees.

Structure

The following descriptions are used to rate the structural integrity of a tree. Trees with a rating of 3 or 4 are generally stable, sound trees which do not require significant pruning, although cleaning, thinning, or raising the canopy might be desirable. Trees with a rating of 2 are generally poor candidates for preservation unless they are preserved well away from improvements or active use areas. Significant time and effort would be required to reconstruct the canopy and improve structural integrity. Trees with a rating of 1 are hazardous and should be removed.

(4) Good structure - minor structural problems may be present which do not require corrective action.

(3) Moderate structure - normal, typical structural issues which can be corrected with pruning.

(2) Marginal structure - serious structural problems are present which may or may not be correctable with pruning, cabling, bracing, etc.

(1) Poor structure - hazardous structural condition which cannot be effectively corrected with pruning or other measures, may require removal depending on location and the presence of targets.

TREE LOCATION PLAN

Protected trees with white numbers
Non protected trees with grey numbers

Sebastopol A Tree Location Map

Horticultural Associates

Date: 4/11/2019 Scale: 1:1,500 1 inch = 125 feet

125 0 125 Feet

Legend

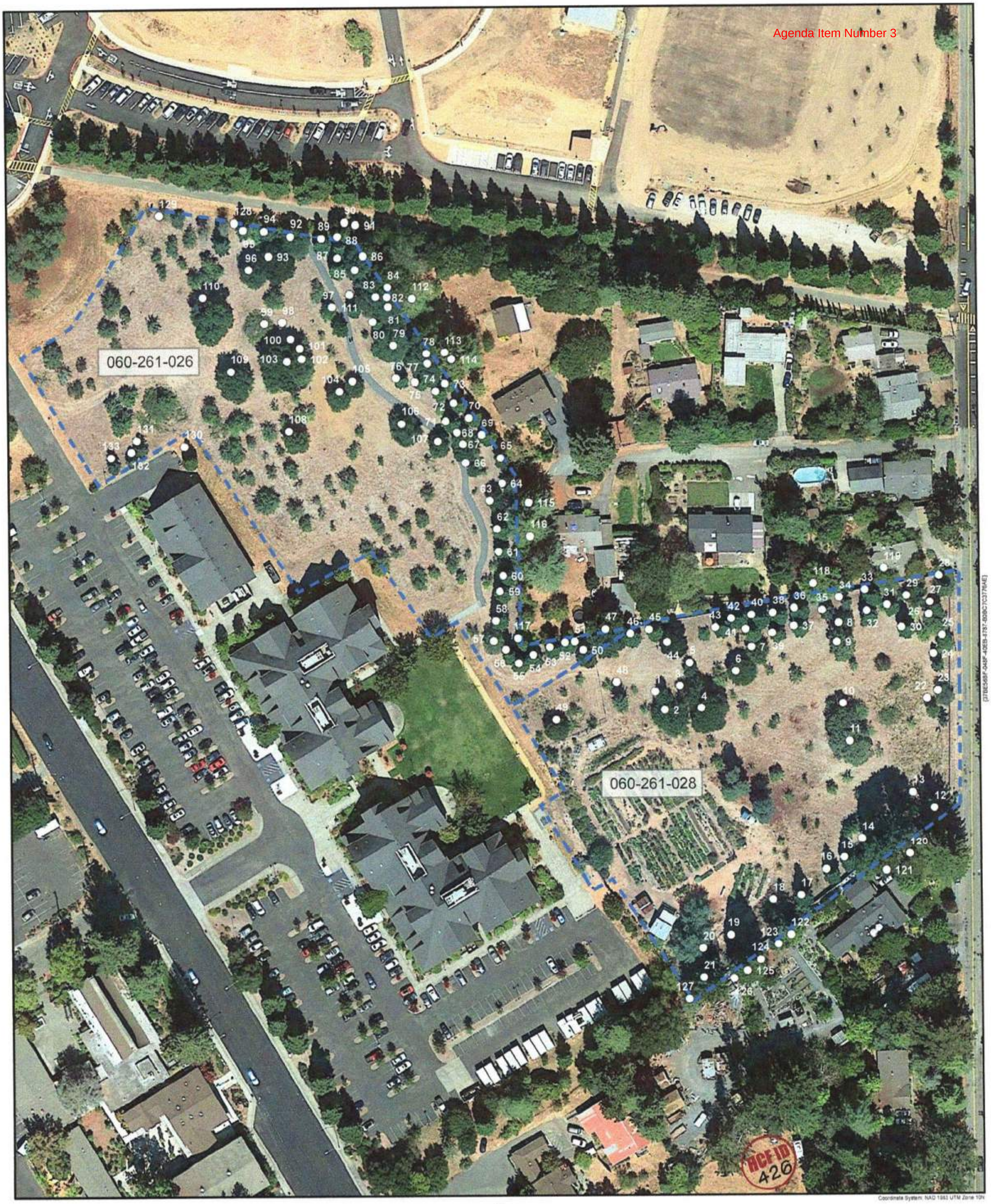
Tree Locations

Tree < 10 in dia.

Parcels

TREE LOCATION PLAN

Illustrates all trees greater than 6 inches in trunk diameter



Sebastopol A Tree Location Map

Horticultural Associates

Date: 4/8/2019 **Scale: 1:1,500** **1 inch = 125 feet**

125 0 125 Feet

Legend

Tree Locations Parcels

HORTICULTURAL Associates
Consultants in Horticulture and Arboriculture
P.O Box 1261, Glen Ellen, CA 95442

January 17, 2023

Samantha Hauser
City Ventures
444 Speer Street
San Francisco, CA 94105

Re: North Gravenstein Highway, Sebastopol A Subdivision; additional tree removal documentation

Samantha,

After reviewing the latest set of plans for the above referenced project I found one additional protected tree that will require removal due to the required location of the new driveway apron along Gravenstein Highway, and this tree data is documented below:

Tree # 134
Sequoia sempervirens- Coast Redwood
Trunk Diameter 30", Dripline Radius 15', Height 50'

Health- Good (4)

Structure- Good (4)

Development Impact- Significant (3)

Recommendation- Removal required, significant development impacts (2)

I have included plans that show the location of this tree. Please contact me if you have questions or need additional information.

Regards,

John C. Meserve
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor/TRAQ
ASCA Qualified Tree and Plant Appraiser/TPAQ

INTERNATIONAL SOCIETY OF ARBORICULTURE ★ JOHN C. MESERVE ★ WE-0478A ★ CERTIFIED ARBORIST

~ Voice 707-935-3911 Fax 707-935-7103 ~

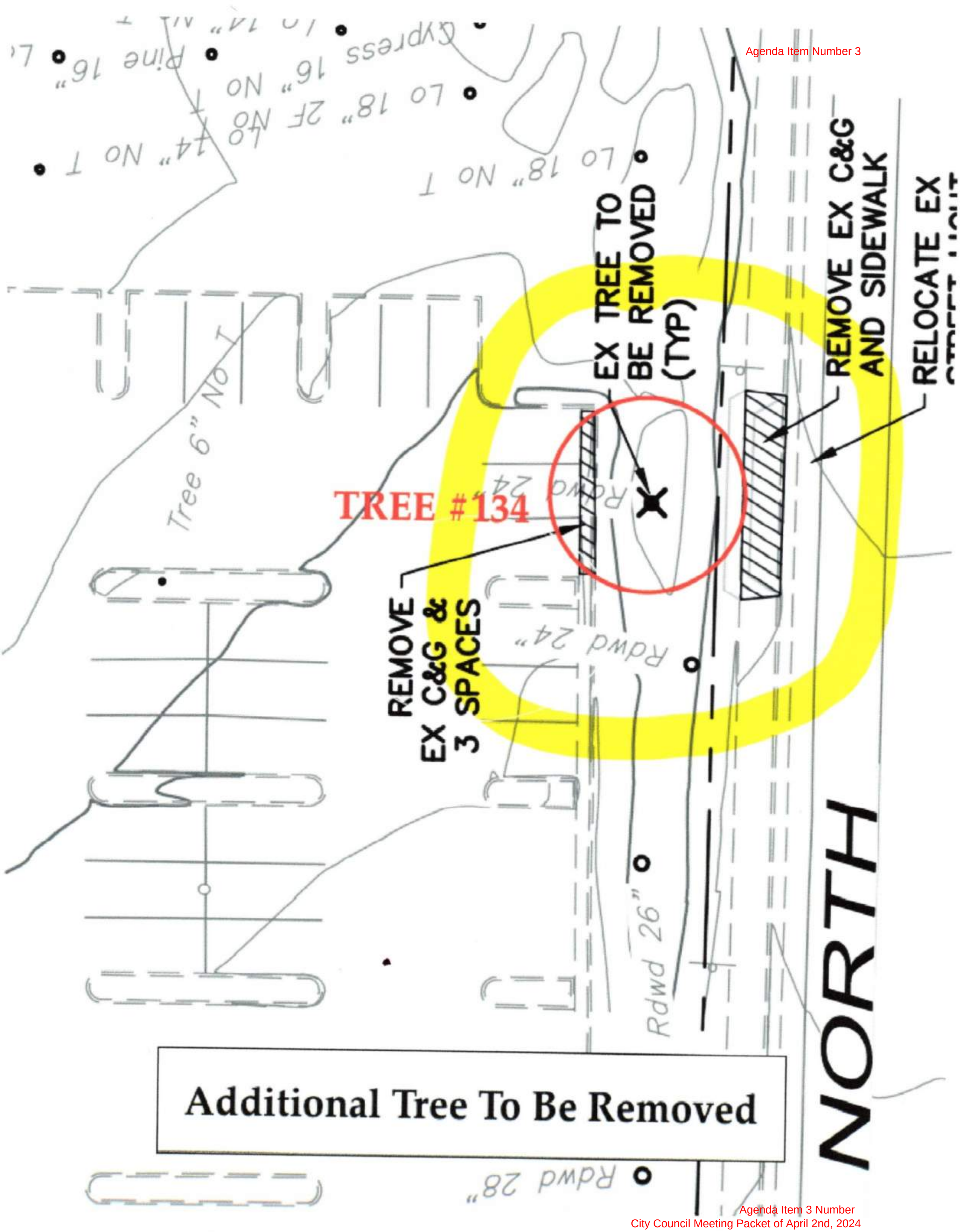
TREE LOCATION PLANS

Sebastopol A Tree Location Map

Horticultural Associates

Date: 4/11/2019 Scale: 1:1,500 1 inch = 125 feet

Location of additional tree that requires removal


TREE #134
EX TREE TO BE REMOVED (TYP)
REMOVE EX C&G AND SIDEWALK
RELOCATE EX
REMOVE EX C&G & 3 SPACES
NORTH
Tree 6" No 1
Rdwd 24"
Rdwd 26"
Rdwd 28"
Lo 18" No 1
Additional Tree To Be Removed

Appendix E

Confidential Cultural Resources Evaluation

This appendix item is not public because it contains confidential information regarding the location of cultural resources. To discuss this report, please contact:

City of Sebastopol Planning Department
7120 Bodega Avenue
Sebastopol, California 95472
(707) 823-6167

Appendix F

Geotechnical Investigation

GEOTECHNICAL INVESTIGATION

On

PROPOSED RESIDENTIAL DEVELOPMENT
GRAVENSTEIN VILLAGE

At

1003, 1005 and 1007 Gravenstein Highway,
Sebastopol, California

For

SEB LLC

By
Quantum Geotechnical, Inc.

Project No. E037.G
June 17, 2021

QUANTUM GEOTECHNICAL, INC.

Project No. E037.G
June 17, 2021

Mr. Craig Atkins
SEB LLC
3121 Michelson Drive
Suite 150
Irvine, CA 92612

Subject: Proposed Residential Development
Gravenstein Village
1003, 1005 and 1007 Gravenstein Highway
Sebastopol, California
GEOTECHNICAL INVESTIGATION

Dear Mr. Atkins;

In accordance with your authorization, ***Quantum Geotechnical, Inc.,*** has investigated the geotechnical conditions at the subject site located in Sebastopol, California

The accompanying report presents the results of our field investigation. Our findings indicate that development of the site for the proposed development is feasible provided the recommendations of this report are carefully followed and are incorporated into the project plans and specifications.

Should you have any questions relating to the contents of this report or should additional information be required, please contact our office at your convenience.

Sincerely,
Quantum Geotechnical, Inc.

Simon Makdessi, P.E., G.E.
President

TABLE OF CONTENTS

GEOTECHNICAL INVESTIGATION

PURPOSE AND SCOPE

The purpose of the investigation for the proposed new residential development located at 1003, 1005 and 1007 Gravenstein Hwy, Sebastopol in California was to determine the surface and subsurface soil conditions at the subject site. Based on the results of the investigation, criteria were established for the grading of the site, the design of foundations for the proposed development, and the construction of other related facilities on the property.

Our investigation included the following:

a. Field reconnaissance by the Soil Engineer;
b. Determine the general seismicity of the site in accordance with the 2019 CBC;
c. Excavation and logging of four exploratory soil borings;
c. Laboratory testing of soil samples;
d. Analysis of the data and formulation of conclusions and recommendations; and
e. Preparation of this written report.

PROPOSED DEVELOPMENT

Based on a review of a Conceptual Site Plan by WHA, it is our understanding that the proposed project consists of developing the site for the construction of a multi-family residential subdivision, and associated improvements. Preliminary development plans indicate a total of 80 units within 19 buildings.. Grading details are not known but are anticipated to consist of cuts and fills up to 5 feet given the gently undulating nature of the terrain. The proposed structures are planned to be founded on a post-tensioned slab foundation

SITE LOCATION AND DESCRIPTION

The site is located in an established residential neighborhood in the western part of Sebastopol, on the north east side of Gravenstein Highway, just south of the intersection with Mill Station Road. The site resides on gently undulating terrain within a broad northwest to southeast trending valley at elevation approximately 185 to 200 feet above mean sea level. The site is irregular in shape and approximately 6.1 acres in size.

The site is currently occupied by an apple orchard, asphaltic concrete trail and a community garden at the south corner. Vegetation cover consists of short to tall grass, scattered blackberry bushes, many apple trees, some pear and almond trees and mature redwood, oak and other native trees,

General Geologic Conditions

The site is located within the Coast Ranges Geomorphic Province of California. Throughout the Cenozoic Era, the western part of California has been affected by tectonic forces associated with lateral or transform plate motion between the North American and Pacific crustal plates, which has produced a complex system of northwest-trending faults - the San Andreas, Hayward, and Calaveras Fault systems being the most prominent within the Bay Area. Uplift, erosion and subsequent re-deposition of sedimentary rocks within this province have been driven primarily by the northwest-southeast directed strike-slip movement of the tectonic plates and the associated northeast oriented compressional stress. The northwest-trending coastal mountain ranges are the result of an orogeny believed to have been occurring since the Pleistocene epoch (approximately 2-3 million years before present).

According to the geologic map of Blake et al. (2005), the site is underlain by sediments of the Wilson Grove Formation of Mio-Pliocene age. This formation consists predominantly of "mostly massive or thick-bedded, buff-weathering, light-grey, fine grained quartz lithic arenite". It is expected that this bedrock is capped in places by a thin fill of Holocene age alluvium and weathered bedrock. These soils would be expected to consist of silty clays to sandy silts.

The California Geological Survey (CGS) has not yet published a map categorizing liquefaction or landslide hazards in the vicinity. The Association of Bay Area Governments (ABAG) liquefaction susceptibility map categorizes the site in an area with low susceptibility. The site lies within proximity of several major Quaternary active Bay Area faults including: the Joy Woods Fault 6.5 miles due west, the Rodgers Creek Fault 8.1 miles northeast, the Bennett Valley Fault 10.8 miles northeast, and the San Andreas Fault 12.2 miles southwest. The California Water Resources Library indicates that at a nearby site, approximately 0.2 miles to the north, groundwater historically has been encountered at 20 feet below ground surface.

INVESTIGATION

The field investigation was performed on May 6, 2021, and included a reconnaissance of the site and the drilling of four exploratory borings, at the locations shown on Figure 3, “Site Plan” attached to Appendix A.

The borings were drilled to depths ranging from 21 to 41 feet below the existing grade. The drilling was performed with a truck-mounted DR 10K1 drill rig utilizing 8 inch diameter hollow stem augers. Visual classifications were made from cuttings and the samples in the field. As the drilling proceeded, disturbed soil samples were obtained by means of a 2.0 inch O.D. split-spoon sampler. The sampler was driven into the in-situ soil under the impact of a 140-pound hammer undergoing a free fall of 30 inches. The number of blows required to advance the sampler 12 inches into the soil is reported on the boring logs. The samples were sealed and returned to the laboratory for testing. Classifications made in the field were verified in the laboratory after further examination and testing. The stratification of the soils, descriptions, location of undisturbed soil samples and blow counts are shown on the respective "Logs of Test Borings" contained within Appendix A.

Laboratory testing was conducted for moisture content, Atterberg Limits, sieve analysis, and corrosion potential. The laboratory test results are presented on the boring logs, and summarized in Appendix B.

SUBSURFACE CONDITIONS

The subsurface conditions as encountered in the borings were generally consistent across the site and consisted of a 1 to 2 foot thick surface layer of silty sand underlain by stiff to very stiff sandy clay with layers/zones of medium dense clayey sand, to a depth of 14 to 20 feet, where a medium dense to dense, silty, gravelly or clayey sand was encountered to the maximum depth explored of 41.5 feet.

Groundwater was encountered in boring B-1 at a depth of 33 feet, at the time of our investigation. Groundwater elevation may fluctuate based on seasonality, nearby development activities, and urbanization, among other factors.

A more thorough description and stratification of the soil conditions are presented on the respective, "Logs of Test Borings" in Appendix A. The approximate locations of the borings are shown on Figure 3, "Site Plan" Appendix A.

LIQUEFACTION POTENTIAL EVALUATION

Liquefaction occurs primarily in relatively loose, saturated, cohesionless soils. Under earthquake stresses, these soils become "quick", lose their strength and become incapable of supporting the weight of the overlying soils or structures. The data used for evaluating liquefaction potential of the subsurface soils consisted of the penetration resistance, the soil gradation, the relative density of the materials, and the groundwater level. For the purpose of our evaluation, we have assumed a design groundwater table depth of 30 feet.

Loose to medium dense cohesionless soil such as sands and some silts and low plasticity clays are potentially liquefiable, while dense and very dense cohesionless sands and gravels are considered to have a very low potential for liquefaction. Based on the data from boring B-1, it is estimated that a liquefaction induced settlement of 0.75 inch may occur. Given the variability in consistency and distribution of the sand layers across the site, a differential settlement of 0.4 inches over 100 feet is estimated. Due to the presence of a thick predominantly non-liquefiable cover overlying any potential liquefiable sand layers, no sand boils are expected and will limit any surface manifestations of liquefaction to differential settlements estimated above.

DYNAMIC COMPACTION/SETTLEMENT EVALUATION

Strong earthquake shaking can cause densification of loose to medium dense cohesionless soils above the groundwater table. The cohesionless soil above the groundwater table in all borings were generally medium dense and has the potential for dynamic settlement. Dynamic settlements of up to 0.5 inch may occur. A differential settlement of 0.3 inches over 100 feet is estimated.

2019 CBC SEISMIC DESIGN CRITERIA

The potential damaging effects of regional earthquake activity should be considered in the design of structures. As a minimum, seismic design should be in accordance with Chapter 16 of the 2019

California Building Code (CBC). The 2019 CBC utilizes the design procedures outlined in the ASCE 7-16 Standard.

Using the criteria in Chapter 20 of ASCE 7-16, in its current condition, the site is classified as Site Class F, due to the presence of liquefiable soil, and a site response analysis is required. However, per the requirements of ASCE 7-10, section 20.3.1.1, a site response analysis is not required because the fundamental period of vibration of the proposed structures is less than 0.5 seconds, and the seismic design can be based on using a site class as determined from Table 20.3-1. Accordingly, the site is classified as Site Class D. The seismic design parameters have been developed using the online "Seismic Design Maps" tool (6) by the Structural Engineering Association (SEA) and Office of Statewide Health Planning and Development (OSHPD) and a site location based on longitude and latitude. The seismic design parameters generated for the subject site for a latitude of 38.411627° N, and longitude of 122.840338° W, are presented in Table I:

According to Section 11.4.8 of ASCE 7-16, a ground motion hazard analysis shall be performed when the coefficient S_1 has a value greater than or equal to 0.2 for Site Class D and E sites. A ground motion hazard analysis is excepted if the C_s value is determined by equation 12.8-2 of ASCE 7-16. This is to be determined by the structural engineer. In the event that the calculated C_s values do not trigger a ground motion hazard analysis, the following parameters may be used.

Table I
2019 CBC Seismic Design Criteria

Seismic Parameter	Coefficient	Value
Site Class – Stiff Soil		D
Peak Ground Acceleration (Site Modified)	PGA_M	0.55
Mapped MCE Spectral Acceleration at Short-Period 0.2 secs	S_s	1.500
Mapped MCE Spectral Acceleration at a Period of 1.0s	S_1	0.600
Adjusted MCE, 5% Damped Spectral Response Acceleration at Short Period of 0.2s	S_{MS}	1.500
Adjusted MCE, 5% Damped Spectral Response Acceleration at Period of 1.0s	S_{M1}	1.020
Design 5% Damped Spectral Response Acceleration at Short Period of 0.2s for Occupancy Category I/II/III	S_{DS}	1.000
Design 5% Damped Spectral Response Acceleration at Period of 1.0s for Occupancy Category I/II/III	S_{D1}	0.680

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

GENERAL

1. From a geotechnical point of view, the site is suitable for the construction of the proposed residential development provided the recommendations presented in this report are incorporated into the project plans and specifications.

2. The most prominent geotechnical features of this site are;
   a) the presence of moderately expansive near surface clay soil that may form the foundation subgrade.
   b) and potentially liquefiable soil deposits.

3. Atterberg Limits testing on the surficial clay registered a Plasticity Index (PI) value of 9, 10 and 22, indicating the near surface materials to vary from low to moderately expansive. The moderately expansive soil material is prone to heave and shrink movements with changes in moisture content and must be carefully considered in the design and construction of foundations, drainage, hardscape and pavements. A post-tensioned slab foundation is the most appropriate foundation system for the proposed structures.

4. As indicated earlier, combined total liquefaction and dynamic settlements are estimated to be of the order of 1.25 inches, with differential settlement of 0.7 inches over 100 feet. This differential settlement must be incorporated into the design of gravity utilities and foundations.

SITE DEMOLITION

5. Prior to any grading, demolition and grubbing of the existing orchard trees, walkways and the community garden, on the site should be completed. Demolition should include the complete removal of all surface and subsurface structures. In addition, all known underground structures such as irrigation pipes or tanks (if present) must be located on the grading plans so that proper removal may be carried out, and all excavations are left open for proper backfilling. It is vital that Quantum Geotechnical Inc., intermittently observe the removal of subsurface structures and excavations, and be notified in ample time to ensure that no subsurface structures or excavations are covered. If

Quantum Geotechnical Inc., is not contacted to observe the demolition and removal of tree root systems, further backhoe exploratory investigation will need to be performed prior to the commencement of grading.

6. Excavations made by the grubbing/removal of the trees and any irrigation pipes will create significant disturbed/loose areas, and where this occurs the loose material should be excavated and replaced as engineered fill, or if it is less than 1 foot in thickness, can be compacted in place, prior to placing fill. We recommend that excavations greater than 1 foot deep be left open by the demolition contractor for backfill in accordance with the requirements for engineered fill. Any soil exposed by the removal operations which are deemed soft or unsuitable by the Soil Engineer, shall be excavated as uncompacted fill and be removed as required by the Soil Engineer during grading. Any resulting excavations should be properly backfilled with engineered fill under the observation of the Soil Engineer. It is important that Quantum Geotechnical Inc., be present during removal activities to verify that all excavations created by removal of subsurface structures are left open and located on a grading plan. If any excavations are loosely backfilled without our knowledge and these excavations are not located and backfilled during grading, future settlement of these loosely filled excavations could occur and may cause damage to structures and improvements.

GRADING

7. The grading requirements presented herein are an integral part of the grading specifications presented in Appendix C of this report and should be considered as such.

8. Grading activities during the rainy season on cohesive soils will be hampered by excessive moisture. Grading activities may be performed during the rainy season, however, achieving proper compaction may be difficult due to excessive moisture; and delays may occur. In addition, measures to control potential erosion may need to be provided. Grading performed during the dry months will minimize the occurrence of the above problems.

9. The site contains much vegetation cover and stripping of vegetation and topsoil will be required. Vegetation conditions may be different at the time of grading, and the extent of any stripping will be revaluated at that time. Organically contaminated soil material or strippings may be utilized in landscape areas located outside the building footprint.

10. Demolition of the existing structures and grubbing of trees may create disturbed/loose areas, and where this occurs the loose material should be excavated and replaced as engineered fill or if it is less than 1 foot in thickness, compacted in place, prior to placing fill. In addition, removal of portions of the existing pavements will be performed. The removed concrete, asphaltic concrete and aggregate base can be reused as fill provided the concrete and AC is broken down to pieces less than 6 inches in size and thoroughly mixed with soil material, however, we recommend that AC not be used in the upper 2 feet of soil in landscape areas as the AC may affect plant growth.

11. Following the removal of any strippings, old fill or loose fill, the top 8 inches of exposed native ground should be scarified and compacted to a minimum degree of relative compaction of 90% at 2 to 3 percent above optimum moisture content as determined by ASTM D1557-12 Laboratory Test Procedure. After recompacting the subgrade, the site may be brought to the desired finished grades by placing engineered fill in lifts of 8 inches in uncompacted thickness and compacting to a relative compaction of at least 90%, at 2 to 3 percent above optimum moisture content.

12. Given the undulating topography of the site and anticipated pad grading, differential fill thickness across a building pad may generally be of the order of 1 to 4 feet. Differential fill thicknesses less than 7 feet do not require mitigation by sub-excavation.

13. In addition, it is anticipated that due to the undulating topography some building pads will be graded such that the building pad will be created by cut and fill. The depth of cut and fill appears to range from 0 to 6 feet. For lots located within cut/fill areas, we recommend that the cut portion of the building pad be sub-excavated to a depth of 2 feet, and the excavation be backfilled with the sub-excavated material as engineered fill. If the base of the sub-excavation is to be ripped moisture conditioned as needed and recompacted in place to the requirements of engineered fill.

14. The near surface soil has variable expansion potential, and it is likely that due to the planned grading, the material at pad grade will have variable expansion potential. This may create non-uniform performance of the soil expansion for cut pads, fill pads and cut/fill pads. This condition will be evaluated in the field during grading, and where this condition occurs, we recommend that the upper 2 feet of the building pad and extending 5 feet laterally beyond the

building perimeter, consist of uniformly mixed and blended soil material. We further recommend this condition be evaluated during grading when the building pad is within 1 foot of design grade, and specific recommendations will be provided for each building pad

15. All soils encountered during our investigation are suitable for use as engineered fill when placed and compacted at the recommended moisture content and provided it does not contain any debris.

SURFACE AND SUBSURFACE DRAINAGE

16. All finish grades should be provided with a positive gradient to an adequate discharge point in order to provide rapid removal of surface water runoff away from all foundations. No ponding of water should be allowed on the pad or adjacent to the foundations. Surface drainage must be designed by the project Civil Engineer and maintained by the property owners at all times. The pad should be graded in a manner that surface flow is to a controlled discharge system.

17. Lot slopes and drainage must be provided by the project Civil Engineer to remove all storm water from the pad and to minimize storm and/or irrigation water from seeping beneath the structures. Should surface water be allowed to seep under the structure, foundation movement resulting in structural cracking and damage will occur. Finished grades around the perimeter of the structure should be compacted and should be sloped at a minimum 2% gradient away from the exterior foundation. Surface drainage requirements constructed by the builder should be maintained during landscaping. In particular, the creation of planter areas confined on all sides by concrete walkways or decks and the residence foundation is not desirable since any surface water due to rain or irrigation becomes trapped in the planter area with no outlet. If such a landscape feature is necessary, surface area drains in the planter area or a subdrain along the foundation perimeter must be installed.

BIO-FILTRATION FACILITIES

18. According to local government requirements, roof downspout and drain flows should be directed to at grade bio-filtration areas, or raised planter boxes next to the building perimeter, where possible. From a geotechnical and maintenance point of view it is undesirable to discharge

water into at grade bio-filtration areas near foundations, because of the possibility of water ponding for sustained periods of time, potentially creating excessive moisture related issues. However, certain design features could be made to minimize such potential effects. In addition, the property owners must always maintain the bio-filtration area to ensure that they are performing as designed and that water does not pond in the area for longer than 48 hours.

19. Typically, the bio-filtration areas consist of an 18 inch layer of sandy loam over 18 inches of permeable gravel material. The top of the bio-filtration area is typically approximately 1 foot below pad grade, therefore, the base of the bio-filtration area will be approximately 4 feet below pad grade. The base of the bio-filtration area will typically contain a perforated pipe to drain any water that may collect within 24 hours. In some situations, the bio-filtration areas may be located immediately adjacent the building structure.

20. Where bio-filtration areas are located closer than 5 feet of the building, the section of loose loam and gravel will provide reduced lateral support, and we recommend a deepened footing be constructed along the perimeter the building adjacent to the bio-filtration area and extending 3 feet beyond in plan length. The depth of the deepened footing will depend on how close the bio-filtration area is located to the building perimeter. As a guide, the footing is to be deepened such that when an imaginary line inclined at 45 degrees from the outside edge base of the footings, it extends below the base of the bio-filtration area excavation. Where bio-filtration areas are located further than 5 feet, no special design is required. Provided the bio-filtration facility is lined with an impermeable liner, no waterproofing of the deepened footing is required.

21. Where bio-filtration areas are located closer than 3 feet of street pavements, a deepened curb footing is required. Where bio-filtration areas are located closer than 1 foot of street pavements, because pavements do not have a positive connection to a deepened curb/footing, the deepened curb/footing may need to be designed as a retaining wall rigid enough to create minimal lateral deflections.

22. Where bio-filtration areas are located closer than 2 feet of hardscape areas, a deepened edge footing is required. The deepened edge should extend at least 1 foot below the subgrade. Where the bio-filtration area is immediately adjacent the hardscape, the deepened edge is to extend at least 3 inches below the base of the bio-filtration system.

FOUNDATIONS

23. Provided the site is prepared as recommended in the "Grading" section, a post-tensioned slab foundation may be satisfactorily used. The slab must be designed to tolerate the expansive clay criteria presented in this section and the estimated total and differential settlements due to liquefaction and consolidation settlement provided earlier.

Post Tensioned Slab-on-Grade

24. Post-tensioned slabs should be designed using the following criteria which is based on the design method presented in the Post-Tensioning Institute, Standard Requirements for Design and Analysis of Shallow Post-Tensioned Concrete Foundations on Expansive Soils (PTI DC10.5-12), 2012. Using the relevant site soil and climatic parameters, the recommended geotechnical criteria for use in the design of the post-tensioned slabs is as follows;

	Swelling Mode	
	Center Lift	Edge Lift
Edge Moisture Variation Distance (e_m)	8.9 feet	4.6
Differential Soil Movement (y_m)	0.70 inches	1.19 inches

25. The maximum allowable bearing pressure at the base of the slab and for localized thickened footings should not exceed 2,000 p.s.f. for dead plus sustained live loads.

26. As indicated earlier, bio-filtration areas may be designed close to the foundation. Where bio-filtration areas are located closer than 5 feet of the building, the section of loose loam and gravel, will provide reduced lateral support, and we recommend a deepened footing be constructed along the perimeter the building adjacent to the bio-filtration area and extending 3 feet beyond in plan length. The depth of the deepened footing will depend on how close the bio-filtration area to the building perimeter. As a guide, the footing is to be deepened such that when an imaginary line inclined at 45 degrees from the outside edge base of the footings, it extends below the base of the bio-filtration area excavation.

General Construction Requirements for Post Tensioned Slab-on-Grade

27. Prior to construction of the slab, the slab subgrade should be observed by the Soil Engineer to verify that all under-slab utility trenches greater than 18 inches in width have been properly backfilled and compacted, and that no loose or soft soils are present on the slab subgrade.

28. Where the building pad consist of clayey soil, the slab subgrade should be soaked to saturation (minimum 5% above optimum) to a depth of 12 to 18 inches prior to placement of the capillary break or vapor retarder/barrier. This should be verified and approved by the Soil Engineer. The penetration of a thin metal probe to a depth of 10-12 inches generally indicates sufficient saturation.

29. The four (4) inch (minimum thickness) layer of gravel typically placed to provide a capillary break beneath concrete slab-on-grade floors may be omitted beneath the monolithically poured mat slab foundations provided that the slabs are at least 10 inches thick as recommended above. If it is desired to use a 4 inch layer or thinner of gravel section, the gravel should consist of broken stone, crushed or uncrushed gravel, quarry waste, or a combination thereof. The aggregate shall be free from deleterious substances. It shall be of such quality that the absorption of water in a saturated dry condition does not exceed 3% of the oven dry weight of the sample. The material shall be ¾" minus material with no more than 3% passing the #200 sieve, as specified in Appendix C.

30. A moisture vapor retarder/barrier is recommended beneath all slabs-on-grade that will be covered by moisture-sensitive flooring materials such as vinyl, linoleum, wood, carpet, rubber, rubber-backed carpet, tile, impermeable floor coatings, adhesives, or where moisture-sensitive equipment, products, or environments will exist. We recommend that design and construction of the moisture vapor retarder/barrier conform to Section 1805 of the 2013 CBC and relevant sections of American Concrete Institute (ACI) guidance documents 302.1R-04, 302.2R-06 and 360R-10.

31. The moisture vapor retarder/barrier can be placed above the 4 inches of gravel or directly on the soil subgrade and should consist of a minimum 10 mils thick polyethylene with a maximum perm rating of 0.1 in accordance with ASTM E 1745. Seams in the moisture vapor retarder/barrier should be overlapped no less than 6 inches or in accordance with the manufacturer's recommendations. Joints and penetrations should be sealed with the manufacturer's recommended adhesives, pressure-sensitive tape, or both. The contractor must avoid damaging or puncturing the

moisture vapor retarder/barrier and repair any punctures with additional polyethylene properly lapped and sealed. The installation of the vapor retarder membrane must be in conformance with ASTM E1643.

32. A minimum of two inches of wetted sand should be placed over the vapor retarder membrane to facilitate curing of the concrete and to act as a cushion to protect the membrane. The perimeter of the mat should be thickened to bear on the prepared building pad and to confine the sand. During winter construction, sand may become saturated due to rainy weather prior to pouring. Saturated sand is not desirable because the sand cushion may become over saturated, and boil into the concrete causing undesirable structural monopolies of sand pockets within the slab. As an alternate, a sand-fine gravel mixture that is stable under saturated conditions may be used. However, the material must be approved by the Soil Engineer prior to use.

33. Alternatively, the sand layer may be eliminated provided the concrete has a maximum water/cement ratio of 0.45 and a 10 mil Class A vapor retarder membrane, such as Stego® Wrap. In any case, the vapor retarder/barrier should have a maximum perm rating of 0.3 in accordance with ASTM E 1745. Seams in the moisture vapor retarder/barrier should be overlapped no less than 6 inches or in accordance with the manufacturer's recommendations. Joints and penetrations should be sealed with the manufacturer's recommended adhesives, pressure-sensitive tape, or both. The contractor must avoid damaging or puncturing the vapor retarder/barrier and repair any punctures with additional polyethylene properly lapped and sealed.

34. It is our understanding that the preferred post-tensioned slab section is to consist of a slab with concrete having a water/cement ratio of no greater than 0.45, over a vapor retarder membrane underlain by soil subgrade. The sand and gravel sections that are sometimes typically used will not be utilized for this project. This is acceptable from a geotechnical point of view.

MISCELLANEOUS CONCRETE FLATWORK

35. Miscellaneous flatwork, driveways, and walkways may be designed with a minimum thickness of 4.0 inches. Any exterior concrete flatwork such as driveways, steps, patios, or walkways should be designed independently of the slab, and expansion joints should be provided between the flatwork and the structural unit. Control joints should be constructed to create squares

or rectangles with a maximum spacing of 15 feet on large slab areas. Control joints for walkways should be constructed at a maximum of 5 feet spacing.

RETAINING WALLS

36. Retaining walls should be designed to resist lateral pressures exerted from a media having an equivalent fluid weight as follows:

Active Condition	=	45 p.c.f. for horizontal backslope
At-rest Condition	=	65 p.c.f.
Passive Condition	=	250 p.c.f.
Coefficient of Friction	=	0.30

37. For a non-horizontal backslope, the active condition equivalent fluid weight can be increased by 1.5 p.c.f. for each 2 degree rise in slope from the horizontal.

38. Active conditions occur when the top of the wall is free to move outward. At-rest conditions apply when the top of wall is restrained from any movement.

39. It should be noted that the effects of any surcharge, traffic or compaction loads behind the walls must be accounted for in the design of the walls.

40. The above criteria are based on fully drained conditions. If drained conditions are not possible, then the hydrostatic pressure must be included in the design of the wall. An additional linear distribution of hydrostatic pressure of 63 p.c.f. should be adopted, in this case.

41. In order to achieve fully-drained conditions, a drainage filter blanket should be placed behind the wall. The blanket should be a minimum of 12 inches thick and should extend the full height of the wall to within 12 inches of the surface. If the excavated area behind the wall exceeds 12 inches, the entire excavated space behind the 12-inch blanket should consist of compacted engineered fill or blanket material. The drainage blanket material may consist of either granular crushed rock and drain pipe fully encapsulated in geotextile filter fabric or Class II permeable material that meets CalTrans Specification, Section 68, with drainage pipe but without fabric. A 4-inch perforated drain pipe should be installed in the bottom of the drainage blanket and should be underlain by at least 4 inches of filter type material. A 12-inch cap of clayey soil material should be placed over the drainage blanket. All back drains should be outlet to suitable drainage devices.

Retaining wall less than 3 feet in height may be provided with backdrains or weep holes.

42. As an alternate to the 12-inch drainage blanket, a pre-fabricated strip drain (such as Miradrain) may be used between the wall and retained soil. In this case, the wall must be designed to resist an additional lateral hydrostatic pressure of 30 p.c.f.

43. Piping with adequate gradient shall be provided to discharge water that collects behind the walls to an adequately controlled discharge system away from the structure foundation.

44. The retaining walls may be founded on a friction pier foundation or on spread footing foundations. Spread footing and pier design criteria are given below.

Retaining Wall/Soundwall Foundation - Spread Footings

45. Spread footings should have a minimum depth of eighteen (18) inches below lowest adjacent pad grade (i.e., trenching depth) for soil subgrade. At this depth, the recommended design bearing pressure for continuous footings should not exceed 2,500 p.s.f. due to dead plus sustained live loads and 3,300 p.s.f. due to all loads which include wind and seismic.

46. To accommodate lateral loads, the passive resistance of the foundation soil can be utilized. The passive soil pressures can be assumed to act against the front face of the footing below a depth of one foot below the ground surface. It is recommended that a passive pressure equivalent to that of a fluid weighing 250 p.c.f. be used. The weight of the soil above the footing can be used in the frictional calculations. For design purposes, an allowable friction coefficient of 0.30 can be assumed at the base of the spread footing.

Retaining Wall/Soundwall Foundation - Pier Footings

47. The piers should be designed on the basis of skin friction acting between the soil and the pier. For the soils at the site, an allowable skin friction value of 500 p.s.f. can be used for combined dead and live loads, below a depth of 2 feet. This value can be increased by one-third for total loads which include wind or seismic forces. Given the moderately expansive nature of the soil, we recommend that any grade beams footings or bottom of soundwall panels that are buried into the ground, should be designed for an uplift pressure of 500 p.s.f. acting against the bottom of the

grade beam/soundwall panel and an uplift adhesion of 300 p.s.f. acting along the upper 2 feet of the pier. Resistance to uplift is to be provided by the pier foundations, and an allowable skin friction value of 500 p.s.f can be used below 2 feet. The size, depth and spacing of the piers is to be determined by the structural engineer.

48. To resist lateral loads, the passive resistance of the soil can be used. The soil passive pressures can be assumed to act against the lateral projected area twice the pier diameter. It is recommended that a passive pressure equivalent to that of a fluid weighing 250 p.c.f be used below 2 feet of final pad grade.

Pavement Areas

49. R-value tests were not performed as part of this investigation, as the soil expected at subgrade level is not known and depends on the planned grading. Assuming the subgrade material will consist of the moderately expansive clay material, we will assume an R-value of 5 for preliminary design.

50. Based on an R-Value of 5, the following flexible pavement sections are recommended.

Traffic Index	AC (inches)	Class II[1] AB (inches)
4.5	3.0	10.0
5.0	3.0	12.0
5.5	3.0	14.0
6.0	4.0	13.5
7.0	4.0	17.0

Notes: [1]Minimum R-Value = 78
R-Value = Resistance Value
All Layers in compacted thickness to Cal-Trans Standard Specifications

51. After underground facilities have been placed in the areas to receive pavement and removal of excess material has been completed, the upper 6 inches of the sub-grade soil shall be scarified,

moisture conditioned, and compacted to a minimum relative compaction of 95% in accordance with the grading recommendations specified in this report.

52. All aggregate base material placed subsequently should be compacted to a minimum relative compaction of 95% based on the ASTM Test Procedure of D1557-12 (latest edition). The construction of the pavement areas should conform to the requirements set forth by the latest Standard Specifications of the Department of Transportations of the State of California and/or City of Sebastopol, Department of Public Works.

53. If planter areas are provided within or immediately adjacent to the pavement areas, provisions should be made to control irrigation water from entering the pavement subgrade. Water entering the pavement section at subgrade level, which does not have a means for discharge, could cause softening of this zone.

UTILITY TRENCHES

54. Applicable safety standards require that trenches in excess of 5 feet must be properly shored or that the walls of the trench slope back to provide safety for installation of lines. If trench wall sloping is performed, the inclination should vary with the soil type. The underground contractor should request an opinion from the Soil Engineer as to the type of soil and the resulting inclination.

55. With respect to state-of-the-art construction or local requirements, utility lines are generally bedded with granular materials. These materials can convey surface or subsurface water beneath the structures. It is, therefore, recommended that all utility trenches which possess the potential to transport water be sealed with a compacted impervious cohesive soil material or lean concrete where the trench enters/exits the building perimeter.

56. Utility trenches extending underneath all traffic areas must be backfilled with native or approved import material and compacted to a relative compaction of 90% to within 6 inches of the subgrade. The upper 6 inches should be compacted to 95% relative compaction in accordance with Laboratory Test Procedure ASTM D1557 (latest edition). Backfilling and compaction of these trenches must meet the requirements set forth by the City of Sebastopol, Department of

Public Works. Utility trenches within landscape areas may be compacted to a relative compaction of 85%.

PROJECT REVIEW AND CONSTRUCTION MONITORING

57. All grading and foundation plans for the development must be reviewed by the Soil Engineer prior to contract bidding or submitted to governmental agencies so that plans are reconciled with soil conditions and sufficient time is allowed for suitable mitigative measures to be incorporated into the final grading specifications.

58. ***Quantum Geotechnical, Inc.*** should be notified at least two working days prior to site clearing, grading, and/or foundation operations on the property. This will give the Soil Engineer ample time to discuss the problems that may be encountered in the field and coordinate the work with the contractor.

59. Field observation and testing during the demolition and/or foundation operations must be provided by representatives of ***Quantum Geotechnical, Inc.*** to enable them to form an opinion regarding the adequacy of the site preparation, the acceptability of fill materials, and the extent to which the earthwork construction and the degree of compaction comply with the specification requirements. Any work related to the grading and/or foundation operations performed without the full knowledge and under the direct observation of the Soil Engineer will render the recommendations of this report invalid. This does not imply full-time observation. The degree of observation and frequency of testing services would depend on the construction methods and schedule, and the item of work.

REFERENCES

1. California Geological Survey. 2008. Guidelines for Evaluating and Mitigating Seismic Hazards in California. Special Publication 117A.

2. Structural Engineers Association and Office of Statewide Health Planning and Development. 2018. “Seismic Design Maps”. Accessed June 17, 2021 from web site: https://seismicmaps.org/.

3. U.S. Geological Survey and California Geological Survey. 2020. "Quaternary fault and fold database for the United States". Accessed June 17, 2021 from USGS web site: http//earthquakes.usgs.gov/regional/qfaults/.

4. U.S. Geological Survey. 2020. “The National Map - Elevation”. Accessed June 17, 2021, from USGS website: https://viewer.nationalmap.gov/theme/elevation/##bottom

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. It should be noted that it is the responsibility of the owner or his representative to notify ***Quantum Geotechnical, Inc.,*** in writing, a minimum of two working days before any clearing, grading, or foundation excavations can commence at the site.

2. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings and from a reconnaissance of the site. Should any variations or undesirable conditions be encountered during the development of the site, ***Quantum Geotechnical,*** will provide supplemental recommendations as dictated by the field conditions.

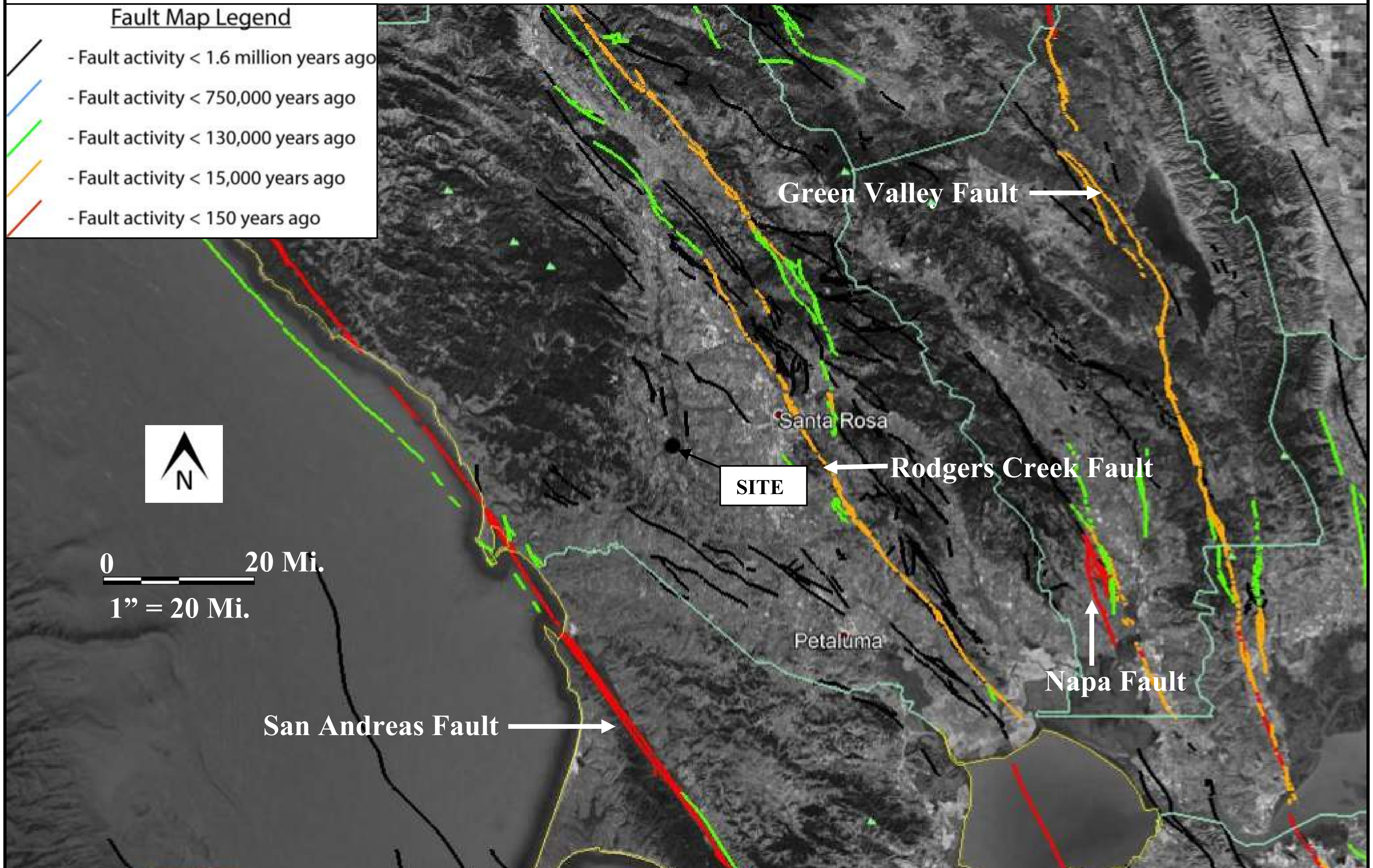
3. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are brought to the attention of the Architect and Engineer for the project and incorporated into the plans and the necessary steps are taken to see that the Contractor and Subcontractors carry out such recommendations in the field.

4. At the present date, the findings of this report are valid for the property investigated. With the passage of time, significant changes in the conditions of a property can occur due to natural processes or works of man on this or adjacent properties. In addition, legislation or the broadening of knowledge may result in changes in applicable standards. Changes outside of our control may render this report invalid, wholly or partially. Therefore, this report should not be considered valid after a period of two (2) years without our review, nor should it be used, or is it applicable, for any properties other than those investigated.

5. Not withstanding all the foregoing, applicable codes must be adhered to at all times.

APPENDIX A

1. Base Map: Google Earth, 2021
2. Fault Map Overlay: U.S. Geological Survey and California Geological Survey. 2020. Quaternary fault and fold database for the United States. Accessed July 15, 2021 from USGS web site: https://earthquake.usgs.gov/hazards/qfaults/.

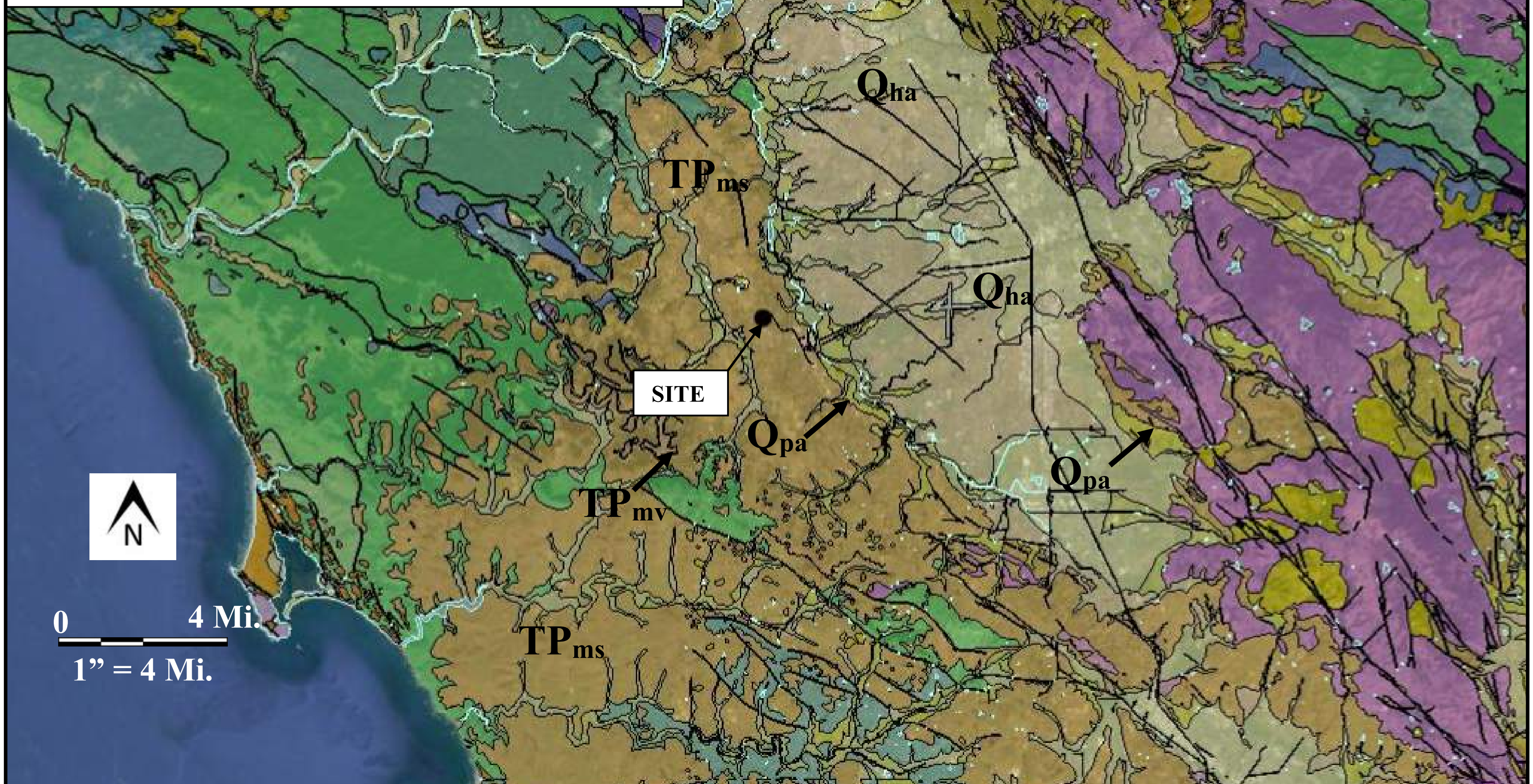


QUANTUM GEOTECHNICAL, INC.	SITE VICINITY AND FAULT MAP			
	Proposed Townhome Development 1003-1007 Gravenstein Hwy., Sebastopol Sonoma County, California	Project No. E037.G	Drawn by: D.T.	Figure No. 1

1. Base Map: Google Earth, 2021
2. Geologic Map Overlay: Graymer, R.W., Moring, B.C., Saucedo, G.J., Wentworth, C.M., Brabb, E.E., and Knudsen, K.L. 2006. “Geologic Map of the San Francisco Bay Region”. USGS. Scientific Investigations Map 2918.

Map Legend

1) Q_{ha} – Alluvium (Holocene)
2) Q_{pa} –Alluvial Fan Deposits (Pleistocene)
3) TP_{ms} – Sedimentary Rock (Pliocene)
4) TP_{mv} –Volcanic Rock (Pliocene)



QUANTUM GEOTECHNICAL, INC.	**REGIONAL GEOLOGIC MAP**			
	Proposed Townhome Development **1003-1007 Gravenstein Hwy., Sebastopol** **Sonoma County, California**	**Project No.** **E037.G**	**Drawn by:** **D.T.**	**Figure No.** **2**

SITE PLAN

Proposed Townhome Development - Gravenstein Village
1003 - 1007 Gravenstein Hwy., Sebastopol
Sonoma County, California

Project No.	Drawn by:	Figure No.
E037.G	D.T.	3

QUANTUM GEOTECHNICAL, INC.

Project: **Gravenstein Village** Project Location: **1003-1007 Gravenstein Hwy., Sebastopol** Project Number: **E037.G**	Log of Boring B-1 **Sheet 1 of 2**	**Quantum Geotechnical, Inc.** **1110 Burnett Ave., Ste B** **Concord, CA 94520**

Date(s) Drilled **05-06-21**	Logged By **SM**	Checked By **DT**
Drilling Method **Hollow Stem**	Drill Bit Size/Type **8"**	Total Depth of Borehole **41.5 ft.**
Drill Rig Type **DR10K1**	Drilling Contractor **Clearheart**	Approximate Surface Elevation **201 ft. amsl.**
Groundwater Level and Date Measured **33 ft.**	Sampling Method(s) **Modified California**	Hammer Data **Auto.**
Borehole Backfill **Grout**	Location **See Site Plan**	

Elevation (feet)	Depth (feet)	Sample Number	Sampling Resistance, blows/ft	Material Type	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines (-#200)	LL, %	PI, %
201	0			SM	Silty SAND: Light brown; dry; fine sand; some fine gravel; dense.					
		1-1	18	CL	Sandy CLAY: Orange to reddish brown with light brown mottling; moist; stiff, friable.	29.3	86.7			
196	5	1-2	16			28.2	90.0		37	10
191	10	1-3	14	CL	Sandy Silty CLAY: Variegated light to orange brown with black charcoal specks, moist to very moist; firm/stiff.	43.1	73.4			
186	15	1-4	21	SM	Clayey silty fine SAND: Cream brown with black charcoal specks; moist; medium dense.	23.9	95.8			
181	20	1-5	24		Grades in and out of sandy clayey silt, clayey silty sand, and silty sandy clay	27.9	92.6			
176	25	1-6	18							
171	30									

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Project: **Gravenstein Village**
Project Location: **1003-1007 Gravenstein Hwy., Sebastopol**
Project Number: **E037.G**

Log of Boring B-1
Sheet 2 of 2

Quantum Geotechnical, Inc.
1110 Burnett Ave., Ste B
Concord, CA 94520

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines (-#200)	LL, %	PI, %
171	30		1-7	23	SM		Clayey silty fine to medium SAND: Cream brown with black charcoal specks; moist; medium dense.					
166	35		1-8	20	SM		Silty SAND: Cream brown; wet; medium dense; fine to medium sand; rounded to subrounded gravels up to 1/2 inch in size.					
161	40		1-9	38								
							Bottom of Boring at 41.5 ft. Groundwater encountered at 33 ft.					
156	45											
151	50											
146	55											
141	60											
136	65											

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Project: **Gravenstein Village** Project Location: **1003-1007 Gravenstein Hwy., Sebastopol** Project Number: **E037.G**	Log of Boring B-2 **Sheet 1 of 1**	**Quantum Geotechnical, Inc.** **1110 Burnett Ave., Ste B** **Concord, CA 94520**

Date(s) Drilled **05-06-21**	Logged By **SM**	Checked By **DT**
Drilling Method **Hollow Stem**	Drill Bit Size/Type **8"**	Total Depth of Borehole **26.5 ft.**
Drill Rig Type **DR10K1**	Drilling Contractor **Clearheart**	Approximate Surface Elevation **201 ft. amsl.**
Groundwater Level and Date Measured **None Encountered**	Sampling Method(s) **Modified California**	Hammer Data **Auto.**
Borehole Backfill **Grout**	Location **See Site Plan**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines (-#200)	LL, %	PI, %
201	0				SM		Silty SAND: Light brown; dry; contains gravel.					
					CL		Sandy CLAY: Red - orange brown with light yellow brown mottling; slightly moist to moist; stiff, friable.					
			2-1	17				24.6	93.3	47.2	35	9
196	5		2-2	22				21.4	100.3			
					CL		At 6 ft.: As above but vari-colored with charcoal specks up to 1/8 inch in size.					
191	10		2-3	11				18.2	92.2			
					SM		Clayey to Silty fine to medium SAND: Cream with black mottling; slightly moist to moist; stiff;					
186	15		2-4	17				20.9	95.8			
181	20				CL		At 20 ft.: Grades from clayey silty sand to silty clayey sand with fine gravel and sandy silty clay with fine gravel.					
			2-5	25								
176	25		2-6	19								
							Bottom of Boring at 26.5 ft. No groundwater was encountered.					
171	30											

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Project: **Gravenstein Village** Project Location: **1003-1007 Gravenstein Hwy., Sebastopol** Project Number: **E037.G**	Log of Boring B-3 **Sheet 1 of 1**	**Quantum Geotechnical, Inc.** **1110 Burnett Ave., Ste B** **Concord, CA 94520**

Date(s) Drilled **05-06-21**	Logged By **SM**	Checked By **DT**
Drilling Method **Hollow Stem**	Drill Bit Size/Type **8"**	Total Depth of Borehole **21.5 ft.**
Drill Rig Type **DR10K1**	Drilling Contractor **Clearheart**	Approximate Surface Elevation **201 ft. amsl.**
Groundwater Level and Date Measured **None Encountered**	Sampling Method(s) **Modified California**	Hammer Data **Auto.**
Borehole Backfill **Grout**	Location **See Site Plan**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines (-#200)	LL, %	PI, %
201	0				SM		Silty SAND: Light brown; dry; dense; contains gravel.					
					CL		Sandy CLAY: Variegated reddish to orange brown and yellow brown; slightly moist to moist; stiff to very stiff; contains fine gravel.					
			3-1	31				26.1	94.1			
196	5		3-2	26				26.3	93.3			
191	10				CL		At 10 ft.: As above; grades to clayey sand with fine gravel; contains large oxidized nodules.					
			3-3	23				19.8	100.8			
					SM		Silty fine to medium SAND with clay: Cream brown; slightly moist; medium dense; minor black mottles.					
186	15		3-4	20								
181	20		3-5	29								
					SC		Clayey SAND: Cream to yellow brown; moist; dense; contains fine gravel up to 1/4 inch.					
							Bottom of Boring at 21.5 ft. No groundwater was encountered.					
176	25											
171	30											

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Project: **Gravenstein Village** Project Location: **1003-1007 Gravenstein Hwy., Sebastopol** Project Number: **E037.G**	Log of Boring B-4 **Sheet 1 of 1**	**Quantum Geotechnical, Inc.** **1110 Burnett Ave., Ste B** **Concord, CA 94520**

Date(s) Drilled **05-06-21**	Logged By **SM**	Checked By **DT**
Drilling Method **Hollow Stem**	Drill Bit Size/Type **8"**	Total Depth of Borehole **26.5 ft.**
Drill Rig Type **DR10K1**	Drilling Contractor **Clearheart**	Approximate Surface Elevation **201 ft. amsl.**
Groundwater Level and Date Measured **None Encountered**	Sampling Method(s) **Modified California**	Hammer Data **Auto.**
Borehole Backfill **Grout**	Location **See Site Plan**	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines (-#200)	LL, %	PI, %
201	0				SM		Silty SAND: Light brown; dry; dense; some gravel.					
			4-1	29	CL		Sandy CLAY with gravel up to 1/4-1/2 inch: Variegated reddish to orange brown and yellow brown; moist; very stiff, friable.	22.9	97.2			
196	5		4-2	30				25.6	97.9	54.3	60	22
191	10		4-3	22	SC		At 10 ft.: As above but grading to clayey sand with gravel and black charcoal specks.	21.0	92.2			
186	15		4-4	10				22.5	81.3			
181	20		4-5	20	SM		Silty fine to medium SAND: Cream brown with black mottles; moist; medium dense; fine to medium sand.					
176	25		4-6	19								
							Bottom of Boring at 26.5 ft. No groundwater was encountered.					
171	30											

Project: **Gravenstein Village** Project Location: **1003-1007 Gravenstein Hwy., Sebastopol** Project Number: **E037.G**	Key to Log of Boring **Sheet 1 of 1**	**Quantum Geotechnical, Inc.** **1110 Burnett Ave., Ste B** **Concord, CA 94520**

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Percent Fines (-#200)	LL, %	PI, %
1	2	3	4	5	6	7	8	9	10	11	12	13

COLUMN DESCRIPTIONS

1 Elevation (feet): Elevation (MSL, feet).
2 Depth (feet): Depth in feet below the ground surface.
3 Sample Type: Type of soil sample collected at the depth interval shown.
4 Sample Number: Sample identification number.
5 Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
6 Material Type: Type of material encountered.
7 Graphic Log: Graphic depiction of the subsurface material encountered.
8 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
9 Water Content, %: Water content of the soil sample, expressed as percentage of dry weight of sample.
10 Dry Unit Weight, pcf: Dry weight per unit volume of soil sample measured in laboratory, in pounds per cubic foot.
11 Percent Fines (-#200): The percent fines (soil passing the No. 200 Sieve) in the sample. WA indicates a Wash Sieve, SA indicates a Sieve Analysis.
12 LL, %: Liquid Limit, expressed as a water content.
13 PI, %: Plasticity Index, expressed as a water content.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS

Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)

Clayey SAND (SC)

Silty SAND (SM)

TYPICAL SAMPLER GRAPHIC SYMBOLS

2.5-inch-OD Modified California w/ brass liners

OTHER GRAPHIC SYMBOLS

Water level (at time of drilling, ATD)

Water level (after waiting)

Minor change in material properties within a stratum

Inferred/gradational contact between strata

? Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Figure B-1

APPENDIX B

Laboratory Investigation

Summary of Laboratory Test Results

LABORATORY INVESTIGATION

The laboratory testing program was directed towards providing sufficient information for the determination of the engineering characteristics of the site soils so that the recommendations outlined in this report could be formulated.

The following tests were performed

- Moisture content;
- Sieve analysis
- Atterberg Limits tests;

A summary of all laboratory test results is presented on Table B-I of this appendix and on the respective "Logs of Test Borings", Appendix A.

SUMMARY OF LABORATORY TESTS

TABLE B-1

Sample Number	Depth (ft)	Moisture Content (% Dry Wt.)	Dry Density (pcf)	Sieve Analysis (% Passing No. 200 Sieve)	Atterberg Limits	
					Liquid Limit (%)	Plasticity Index (%)
1-1	3	29.3	86.7			
1-2	6	28.2	90.0		37	10
1-3	11	43.1	73.4			
1-4	16	23.9	95.8			
1-5	21	27.9	92.6			
1-8	31					
2-1	3	24.6	93.3	47.2	35	9
2-2	6	21.4	100.3			
2-3	11	18.2	92.2			
2-4	16	20.9	95.8			
3-1	3	26.1	94.1			
3-2	6	26.3	93.3			
3-3	11	19.8	100.8			
4-1	3	22.9	97.2			
4-2	6	25.6	97.9	54.3	60	22
4-3	11	21.0	92.2			
4-4	16	22.5	81.3			

Appendix C

The Grading Specification

Guide Specifications for Rock Under Floor Slabs

THE GRADING SPECIFICATIONS
on
Proposed Residential Development
Gravenstein Hwy,
Sebastopol, California

1. General Description

1.1 These specifications have been prepared for the grading and site development of the subject residential development. ***Quantum Geotechnical Inc.***, hereinafter described as the Soil Engineer, should be consulted prior to any site work connected with site development to ensure compliance with these specifications.

1.2 The Soil Engineer should be notified at least two working days prior to any site clearing or grading operations on the property in order to observe the stripping of organically contaminated material and to coordinate the work with the grading contractor in the field.

1.3 This item shall consist of all clearing or grubbing, preparation of land to be filled, filling of the land, spreading, compaction and control of fill, and all subsidiary work necessary to complete the grading of the filled areas to conform with the lines, grades, and slopes as shown on the accepted plans. The Soil Engineer is not responsible for determining line, grade elevations, or slope gradients. The property owner, or his representative, shall designate the person or organizations who will be responsible for these items of work.

1.4 The contents of these specifications shall be integrated with the soil report of which they are a part; therefore, they shall not be used as a self-contained document.

2. Tests

The standard test used to define maximum densities of all compaction work shall be the ASTM D1557-12 Laboratory Test Procedure. All densities shall be expressed as a relative compaction in terms of the maximum dry density obtained in the laboratory by the foregoing standard procedure.

3. Clearing, Grubbing, and Preparing Areas To Be Filled

3.1 If encountered, all vegetable matter, trees, root systems, shrubs, debris, and organic topsoil shall be removed from all structural areas and areas to receive fill.

3.2 If encountered, any soil deemed soft or unsuitable by the Soil Engineer shall be removed. Any existing debris or excessively wet soils shall be excavated and removed as required by the Soil Engineer during grading.

3.3 All underground structures shall be removed from the site such as old foundations, abandoned pipe lines, septic tanks, and leach fields.

3.4 The final stripped excavation shall be approved by the Soil Engineer during construction and before further grading is started.

3.5 After the site has been cleared, stripped, excavated to the surface designated to receive fill, and scarified, it shall be disked or bladed until it is uniform and free from large clods. The native subgrade soils shall be moisture conditioned and compacted to the requirements as specified in the grading section of this report. Fill can then be placed to provide the desired finished grades. The contractor shall obtain the Soil Engineer's approval of subgrade compaction before any fill is placed.

4. Materials

4.1 All fill material shall be approved by the Soil Engineer. The material shall be a soil or soil-rock mixture which is free from organic matter or other deleterious substances. The fill material shall not contain rocks or lumps over 6 inches in greatest dimension and not more than 15% larger than 2-1/2 inches. Materials from the site below the stripping depth are suitable for use in fills provided the above requirements are met.

4.2 Materials existing on the site are suitable for use as compacted engineered fill after the removal of all debris and organic material. All fill soils shall be approved by the Soil Engineer in the field.

4.3 Should import material be required, it should be approved by the soil Engineer before it is brought to the site.

5. Placing, Spreading, and Compacting Fill Material

5.1 The fill materials shall be placed in uniform lifts of not more than 8 inches in uncompacted thickness. Each layer shall be spread evenly and shall be thoroughly blade mixed during the spreading to obtain uniformity of material in each layer. Before compaction begins, the fill shall be brought to a water content that will permit proper compaction by either (a) aerating the material if it is too wet, or (b) spraying the material with water if it is too dry.

5.2 After each layer has been placed, mixed, and spread evenly, either import material or native material shall be compacted to a relative compaction designated for engineered fill.

5.3 Compaction shall be by footed rollers or other types of acceptable compacting rollers. Rollers shall be of such design that they will be able to compact the fill to the specified density. Rolling shall be accomplished while the fill material is within the specified moisture content range. Rolling of each layer shall be continuous over its entire area and the roller shall make sufficient trips to ensure that the required density has been obtained. No ponding or jetting shall be permitted.

5.4 Field density tests shall be made in each compacted layer by the Soil Engineer in accordance with Laboratory Test Procedure ASTM D1556-15 or D6938-10. When footed rollers are used for compaction, the density tests shall be taken in the compacted material below the surface disturbed by the roller. When these tests indicate that the compaction requirements on any layer of fill, or portion thereof, has not been met, the particular layer, or portion thereof, shall be reworked until the compaction requirements have been met.

5.5 No soil shall be placed or compacted during periods of rain nor on ground which contains free water. Soil which has been soaked and wetted by rain or any other cause shall not be compacted until completely drained and until the moisture content is within the limits hereinbefore described or approved by the Soil Engineer. Approval by the Soil Engineer shall be obtained prior to continuing the grading operations.

6. Pavement

6.1 The proposed subgrade under pavement sections, native soil, and/or fill shall be compacted to a minimum relative compaction of 95% at 2% above optimum moisture content for a depth of 12 inches.

6.2 All aggregate base material placed subsequently should also be compacted to a minimum relative compaction of 95% based on the ASTM Test Procedure D1557-12. The construction of the pavement in the parking and traffic areas should conform to the requirements set forth by the latest Standard Specifications of the Department of Transportation of the State of California and/or City of Sebastopol, Department of Public Works.

6.3 It is recommended that soils at the proposed subgrade level be tested for a pavement design after the preliminary grading is completed and the soils at the site design subgrade levels are known.

7. Utility Trench Backfill

7.1 The utility trenches extending under concrete slabs-on-grade shall be backfilled with native on-site soils or approved import materials and compacted to the requirements pertaining to the adjacent soil. No ponding or jetting will be permitted.

7.2 Utility trenches extending under all pavement areas shall be backfilled with native or approved import material and properly compacted to meet the requirements set forth by the City of Sebastopol, Department of Public Works.*

7.3 Where any opening is made under or through the perimeter foundations for such items as utility lines and trenches, the openings must be resealed so that they are watertight to prevent the possible entrance of outside irrigation or rain water into the underneath portion of the structures.

8. Subsurface Line Removal

8.1 The methods of removal will be designated by the Soil Engineer in the field depending on the depth and location of the line. One of the following methods will be used.

8.2 Remove the pipe and fill and compact the soil in the trench according to the applicable portions of sections pertaining to compaction and utility backfill.

8.3 The pipe shall be crushed in the trench. The trench shall then be filled and compacted according to the applicable portions of Section 5.

8.4 Cap the ends of the line with concrete to prevent entrance of water. The length of the cap shall not be less than 5 feet. The concrete mix shall have a minimum shrinkage.

9. Unusual Conditions

9.1 In the event that any unusual conditions not covered by the special provisions are encountered during the grading operations, the Soil Engineer shall be immediately notified for additional recommendations.

10. General Requirements

Dust Control

10.1 The contractor shall conduct all grading operations in such a manner as to preclude windblown dirt and dust and related damage to neighboring properties. The means of dust control shall be left to the discretion of the contractor and he shall assume liability for claims related to windblown material.

GUIDE SPECIFICATIONS FOR ROCK UNDER FLOOR SLABS

Definition

Graded gravel or crushed rock for use under slabs-on-grade shall consist of a minimum thickness of mineral aggregate placed in accordance with these specifications and in conformance with the dimensions shown on the plans. The minimum thickness is specified in the accompanying report.

Material

The mineral aggregate shall consist of broken stone, crushed or uncrushed gravel, quarry waste, or a combination thereof. The aggregate shall be free from deleterious substances. It shall be of such quality that the absorption of water in a saturated dry condition does not exceed 3% of the oven dry weight of the sample.

Gradation

The mineral aggregate shall be of such size that the percentage composition by dry weight, as determined by laboratory sieves (U.S. Sieves) will conform to the following gradation:

Sieve Size	Percentage Passing
¾''	90-100
No. 4	25-60
No. 8	18-45
No. 200	0-3

Placing

Subgrade, upon which gravel or crushed rock is to be placed, shall be prepared as outlined in the accompanying soil report.

Appendix G

Transportation Impact Study

Draft Report

Transportation Impact Study for The Canopy Project

Prepared for the
City of Sebastopol

September 6, 2023

490 Mendocino Avenue, Suite 201 **SANTA ROSA**, CA 95401 707.542.9500
414 13th Street, 5th Floor **OAKLAND**, CA 94612 510.444.2600
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Table of Contents

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Introduction

This report presents an analysis of the potential transportation, traffic, and mobility impacts that would be associated with a proposed residential development to be located at 1009-1011 Gravenstein Highway North in the City of Sebastopol. The traffic study was completed in accordance with the criteria established by the City of Sebastopol and is consistent with standard traffic engineering techniques.

Prelude

The purpose of a traffic impact study is to provide City staff and policy makers with data that they can use to make an informed decision regarding the potential transportation impacts of the proposed project, and any associated improvements that would be required to mitigate these impacts to an acceptable level under the California Environmental Quality Act (CEQA), the City's General Plan, or other policies. This report provides an analysis of those items that are identified as areas of environmental concern under the CEQA. Impacts associated with access for pedestrians, bicyclists, and to transit; the vehicle miles traveled (VMT) generated by the project; and safety concerns are addressed in the context of the CEQA criteria. While no longer a part of the CEQA review process, vehicular traffic service levels at key intersections were evaluated for consistency with General Plan policies by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on anticipated travel patterns specific to the proposed project, then analyzing the effect the new traffic would be expected to have on the study intersections and need for improvements to maintain acceptable operation.

The report is organized to provide background data that supports the various aspects of the analysis, followed by the assessment of CEQA issues and then evaluation of policy-related issues.

Project Profile

Project Description

The proposed residential project site is located on a vacant 6.1-acre parcel in northwest Sebastopol. It is adjacent to the O'Reilly Media Center to the west, which fronts on SR 116 (Gravenstein Highway North). Access would be provided via the intersection of SR 116/Mill Station Road as well as via the southernmost drive aisle of the existing office park parking lot to the south. The project would include 80 three-story townhome-style condominiums, with the potential for 16 ADA-accessible accessory dwelling units (ADUs). For the purposes of CEQA, full buildout of the site with 96 units was assumed. The proposed project site plan is shown in Figure 1.

Source: Weinstein Architects + Urban Designers LLC 3/13 seb080.ai 9/23

Transportation Impact Study for The Canopy Project

Figure 1– Site Plan

W-Trans

Transportation Setting

Study Area and Periods

The study area varies depending on the topic. For pedestrian trips it consists of all streets within a half-mile of the project site that would lie along primary routes of pedestrian travel, or those leading to nearby generators or attractors. For bicycle trips it consists of all streets within one mile of the project site that would lie along primary routes of bicycle travel. For the safety and traffic operational analyses, it consists of the project frontage and the following intersections:

1. SR 116 (Gravenstein Highway North)/Occidental Road
2. SR 116 (Gravenstein Highway North)/Mill Station Road
3. SR 116 (Gravenstein Highway North)/Hurlbut Avenue
4. SR 116 (Gravenstein Highway North-Healdsburg Avenue)/Covert Lane
5. SR 116 (Healdsburg Avenue)/Murphy Avenue
6. SR 116 (Healdsburg Avenue-North Main St)/North Main Street

Operating conditions during the a.m. and p.m. peak periods were evaluated to capture the highest potential impacts for the proposed project as well as the highest volumes on the local transportation network. The morning peak hour occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute, while an extended p.m. peak hour between 2:00 and 6:00 p.m. was analyzed to capture afternoon traffic from the adjacent Sebastopol Charter School as well as traffic typically reflecting the highest level of congestion during the homeward bound commute.

Study Intersections

SR 116 (Gravenstein Highway North)/Occidental Road is a four-legged signalized intersection located outside of the Sebastopol City limits. Crosswalks with pedestrian phasing are present on all but the south leg. Protected left-turn phasing is present on the northbound and southbound approaches and the eastbound and westbound approaches are split-phased or operate concurrently.

SR 116 (Gravenstein Highway North)/Mill Station Road is a four-legged signalized intersection with marked crosswalks and pedestrian phasing on all but the south leg. Protected left-turn phasing is present on the northbound and southbound approaches and the eastbound and westbound approaches are split-phased.

SR 116 (Gravenstein Highway North)/Hurlbut Avenue is a signalized four-legged intersection with marked zebra crosswalks on all four legs. Protected left-turn phasing is present on the northern and southern approaches and pedestrian phasing is present on all four legs. Class II bike lanes are available on the north and south legs of the intersection.

SR 116 (Gravenstein Highway North-Healdsburg Avenue)/Covert Lane is a tee intersection with stop controls on the Covert Lane approach. Covert Lane runs east-west, but curves to the north as it approaches SR 116. East of Covert Lane, SR 116 runs east-west, but curves to the north to the west of Covert Lane. In this study, SR 116 is considered to be the north and south legs and Covert Lane is the west leg. Class II bike lanes exist on both sides of the north leg of SR 116 and exist on the southwest side of SR 116 on the south leg. There are no marked crosswalks on any legs of the intersection.

SR 116 (Healdsburg Avenue)/Murphy Avenue is a three-way intersection with the stop control on the northbound Murphy Avenue approach. Marked crosswalks exist on the west and south legs of the intersection. Class II bike lanes exist on the east and west legs of the intersection, while there are sharrow markings on the south leg. Yield markings are on the east and west legs approaching the intersection and Rectangular Rapid Flashing Beacons (RRFB) are present on the west leg.

SR 116 (Healdsburg Avenue-North Main Street)/North Main Street is a signalized tee intersection with zebra crosswalks and pedestrian phasing on the north and east legs. Protected left-turn phasing exists on the eastern approach of the intersection. North Main Street curves to the west as it approaches Healdsburg Avenue and continues north. Class II bike lanes are present on the north side of the east leg, both sides of the west leg, and Class II bike lanes are present on both sides of the north leg.

The locations of the study intersections and the existing lane configurations and controls are shown in Figure 2.

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is January 1, 2018, through December 31, 2022.

As presented in Table 1, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in *2022 Collision Data on California State Highways*, California Department of Transportation (Caltrans). These average rates statewide are for intersections in the same environment (urban, suburban, rural), with the same number of approaches, and the same controls. Four of the six study intersections had calculated collision rates at or below the statewide average collision rate for similar interactions. The intersections of SR 116/ Occidental Rodd and SR 116/Covert Lane were determined to have collision rates above the statewide average, so these intersections were further reviewed. The collision rate calculations are provided in Appendix A.

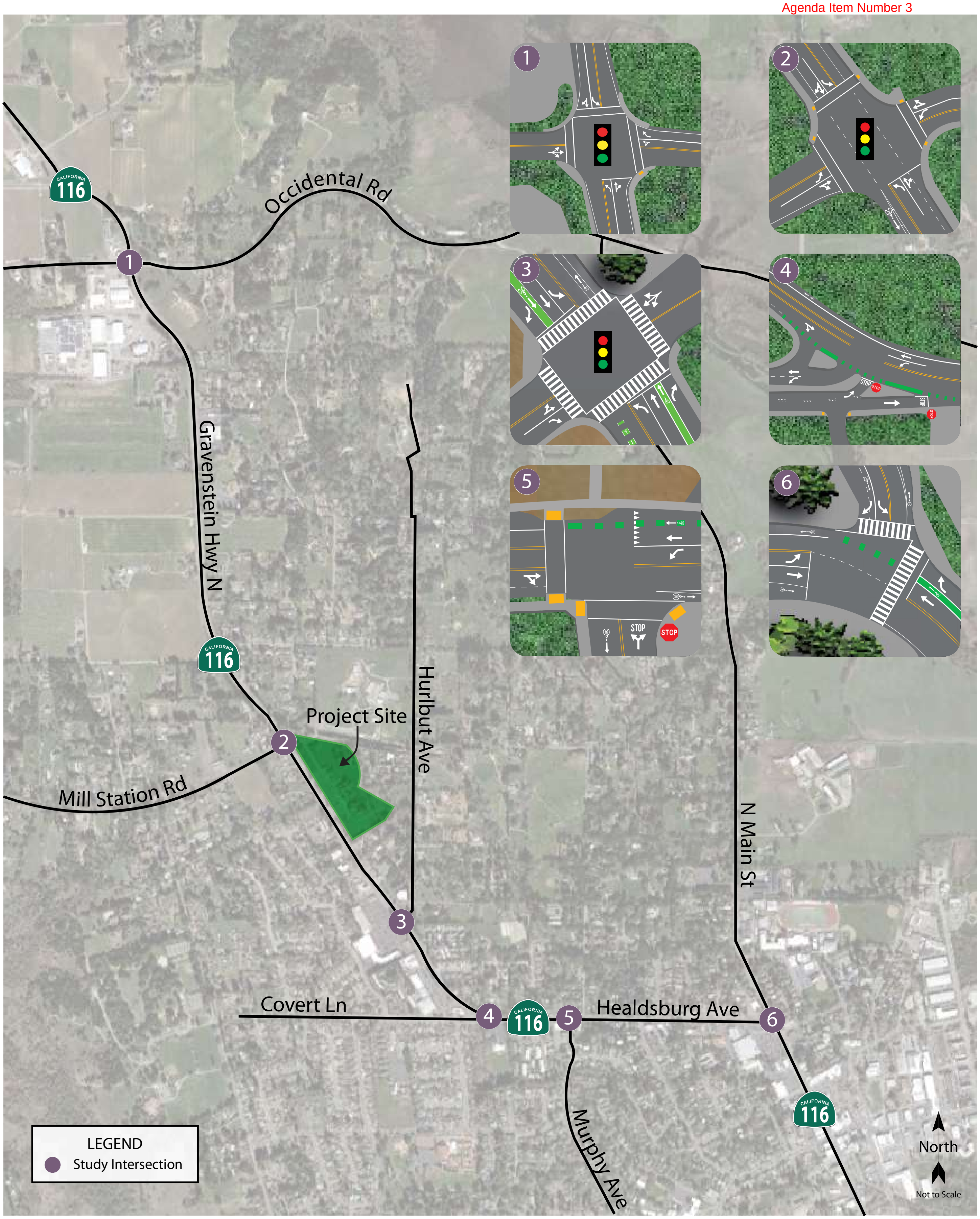
Table 1 – Collision Rates for the Study Intersections

Study Intersection	Number of Collisions (2018-2022)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. SR 116/Occidental Rd	12	**0.29**	0.20
2. SR 116/Mill Station Rd	4	0.14	0.33
3. SR 116/Hurlbut Ave	5	0.18	0.33
4. SR 116/Covert Ln	7	**0.22**	0.13
5. SR 116/Murphy Ave	4	0.13	0.13
6. SR 116 (Healdsburg Ave-N Main St)/N Main St	6	0.12	0.28

Note: c/mve = collisions per million vehicles entering; **Bold** text = higher than the statewide average

Of the 12 collisions that occurred at the intersection of SR 116/Occidental Road, eight were rear ends and four were sideswipes. Unsafe speed was the major factor in six of these collisions, improper passing resulted in three collisions, following too closely, unsafe starting and backing, and driving under the influence were stated as the primary causes for one collision each. While the collision rate is marginally higher than the statewide average, the injury rate is much lower: 16.7 percent versus the statewide average of 47.5 percent. No remedial action is therefore recommended.

The intersection of SR 116/Covert Lane had a total of seven collisions reported with four broadsides, one rear-end, one hit object, and one unspecified. Right-of-way violations were the primary cause of four of these collisions and unsafe speeds, driving on the wrong side of road, and driving under the influence each contributed to one collision. While this intersection has an above average collision rate, no patterns of correctable behavior could be determined and therefore no remedial action is recommended. However, it should be noted that this intersection has been identified for the future installation of a roundabout or traffic signal. The City will be coordinating with Caltrans for future planning and identification of funds to complete this project.



seb080.ai 9/23

Transportation Impact Study for The Canopy Project

Figure 2 – Study Area and Existing Lane Configurations

W-Trans

Circulation System

This section addresses the first transportation bullet point on the CEQA checklist, which relates to the potential for a project to conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

Pedestrian Facilities

Existing and Planned Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. Existing pedestrian facilities along the proposed project site frontage as well as within a one-quarter mile distance of the project site were reviewed.

A generally connected pedestrian network currently exists along SR 116 near the project site. However, there is no sidewalk on the west side of SR 116 north of its intersection with Danmar Drive. Sidewalks are present on the east side of SR 116 south of its intersection with Mill Station Road, and the West County-Joe Rodota Trail follows the east side of SR 116 north of Mill Station Road. As part of the project, pedestrian paths are planned to be built to connect the project site to the existing pedestrian network on the east side of SR 116. One pedestrian path would be located along the southeastern boundary of the project site and connect to the existing sidewalk on SR 116, and one would be located on the north side of the project site and connect to the West County-Joe Rodota Trail.

Caltrans has recently solicited bids for a project to install a new crosswalk with a HAWK (Pedestrian Hybrid Beacon) signal across the north leg of the intersection of SR 116/Danmar Drive. It is expected that this Caltrans-funded improvement will be installed before the end of 2023. It is recommended that a new pedestrian path be added through the center of the site to link the project and mixed commercial office park to the new HAWK crossing.

Pedestrian Safety

The collision history for the study area was reviewed to determine if any trends or patterns may indicate a potential safety issue for pedestrians. Collision records available from SWITRS reports were reviewed for the most current five-year period available, which was January 1, 2018, through December 31, 2022, at the time of the analysis. During the five-year study period there was one reported collision involving a pedestrian within a half mile of the project site. It occurred at the intersection of SR 116/Hurlbut Avenue, which is signalized and has high visibility crosswalks with pedestrian phasing. Based upon details contained in the SWITRS report, the collision was likely due to either driver or pedestrian inattention, and no remedial actions are recommended.

Finding – Pedestrian facilities serving the project site are adequate. The paths proposed and recommended as part of the project would provide adequate access to the existing pedestrian facilities. The project would not conflict with any existing plans or policies relative to pedestrian facilities.

Bicycle Facilities

Existing and Planned Bicycle Facilities

The *Highway Design Manual 7th Edition*, Caltrans, 2020, classifies bikeways into four categories:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route** – signage only for shared use with motor vehicles within the same travel lane on a street or highway.
- **Class IV Bikeway** – also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may

include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, striped buffers, or on-street parking.

In the project vicinity there are several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County-Joe Rodota Trail, which runs between Occidental Road and North Main Street. There are existing bicycle lanes along SR 116 between the north city limit and North Main Street, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116. There are also several Class III bike routes in the project vicinity, most of which feature sharrow pavement markings.

According to the *Countywide Active Transportation Plan* (2014), bike lanes are planned along SR 116 between Occidental Road and the north city limit, on Bodega Avenue between Ragle Road and Dutton Avenue, and along Mill Station and Ragle roads between SR 116 and Covert Lane. Class I facilities are planned adjacent to Occidental Road and Bodega Avenue, and a Class III route is planned on Mill Station Road west of Ragle Road. Bicyclists ride in the roadway and/or on sidewalks along all other streets within the project study area. Table 2 summarizes the existing and planned bicycle facilities in the project vicinity, as contained in the *Countywide Active Transportation Plan*.

Table 2 – Bicycle Facility Summary

Status Facility	Class	Length (miles)	Begin Point	End Point
Existing				
West County/Rodota Trail	I	1.68	Occidental Rd	N Main St
Occidental Rd	II	1.83	Mill Station Rd	High School Rd
Covert Ln	II	0.50	Ragle Rd	SR 116
SR 116	II	0.52	North City Limit	Covert Ln
SR 116 (Healdsburg Ave)	II	0.64	Covert Ln	N Main St
High School Rd/N Main St	II	1.56	Occidental Rd	SR 116
Valentine Ave	III	0.60	Ragle Rd	Murphy Ave
Danmar Dr/Norlee St	III	0.48	SR 116	Covert Ln
Washington Ave	III	0.56	Willard Libby Park	Bodega Ave
Ragle Rd	III	0.52	Covert Ln	Bodega Ave
Pleasant Hill Ave	III	0.50	Covert Ln	Bodega Ave
Zimpher Dr	III	0.21	Covert Ln	Valentine Ave
Murphy Ave	III	0.38	SR 116	Valentine Ave
Planned				
West County/Rodota Trail	I	0.91	West County/Rodota Trail (west segment)	SR 116
Bodega Ave	I	0.29	Atascadero Creek	Ragle Rd
Mill Station Rd	II	0.26	Ragle Rd	SR 116
Bodega Ave	II	0.87	Ragle Rd	Dutton Ave-Jewell Ave
SR 116	II	0.95	Occidental Rd	North City Limit
Ragle Rd	II	0.41	Mill Station Rd	Covert Ln
Mill Station Rd	III	1.91	Occidental Rd	Ragle Rd

Source: *Countywide Active Transportation Plan*, Sonoma County Transportation Authority, 2014

The project as proposed would not result in the construction of any new bicycle facilities.

Bicyclist Safety

Collision records for the study area were reviewed to determine if there had been any bicyclist-involved crashes during the five-year study period between January 1, 2018, and December 31, 2022. There were two reported collisions involving bicyclists in the study area and both were likely caused by the cyclist violating the vehicle's right of way. No remedial action is therefore recommended.

Finding – Existing and planned bicycle facilities would provide adequate access for bicyclists traveling to and from the project. The project would not conflict with any policies or plans for bicycle facilities.

Transit Facilities

Existing Transit Facilities

Sonoma County Transit

Sonoma County Transit (SCT) provides fixed-route bus service in Sebastopol and surrounding areas. SCT Route 20, Route 24, and Route 26 all have stops within a half mile of the project site. Route 20 runs from the Coddingtown Mall in the City of Santa Rosa to Monte Rio in the Russian River Area. Route 24 runs from the Sebastopol Transit Hub to the intersection of SR 116/Mill Station Road, and Route 26 operates on school days only with one bus run in each direction per day, at 7:22 a.m. and 3:38 p.m. Existing transit routes and details regarding their operation are summarized in Table 3.

Table 3 – Transit Routes

Transit Agency Route	Distance to Stop (mi)[1]	Service			Connections
		Days of Operation	Time	Frequency	
Sonoma County Transit					
Route #20	< 0.1	Mon-Fri Sat-Sun	6:30 a.m. - 9:30 p.m. 6:30 a.m. - 9:30 p.m.	50 – 80 min 50 – 105 min	Monte Rio Coddingtown/Santa Rosa
Route #24	< 0.1	Mon-Fri Sat	7:45 a.m. - 6:30 p.m. 7:45 a.m. - 5:30 p.m.	45 – 55 min 45 – 55 min	Sebastopol SR 116/Mill Station Road
Route #26	< 0.1	School Days	7:22 a.m. 3:38 p.m.	1 run 1 run	Mirabel Park Sonoma State Univ.

Notes: [1] Defined as the shortest walking distance between the project site and the nearest bus stop
Source: sctransit.com/maps-schedules

Two bicycles can be carried on most SCT buses, and bike rack space is provided on a first-come, first-served basis. Additional bicycles are allowed on SCT buses at the discretion of the bus operator.

Dial-a-ride, also known as paratransit or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. SCT Paratransit is designed to serve the needs of individuals with disabilities within the City of Sebastopol and the greater Sonoma County area.

Impact on Transit Facilities

Given the size of the proposed project, there is unlikely to be substantial new demand for transit service generated by the development, though it is likely that some residents or visitors will occasionally choose to use transit. The existing pedestrian facilities are adequate to provide access to the project site from the transit stops and there are sufficient routes and headways to accommodate the nominal additional demand.

Finding – Existing public transit routes are adequate to accommodate the additional demand generated by the project, and existing bus stops accessible via continuous sidewalks. Transit facilities serving the project site are therefore considered to be adequate and the project would not conflict with any programs or policies regarding transit.

Significance Finding – The proposed project would have a less-than-significant impact relative to pedestrian, bicycle, and transit modes as it would be consistent with existing plans, policies, and programs for these modes.

Vehicle Miles Traveled (VMT)

The potential for the project to conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b) was evaluated based the project's anticipated Vehicle Miles Traveled (VMT). This is the second bullet point in the CEQA checklist.

Background

The Vehicle Miles Traveled (VMT) associated with a project is the primary basis for determining traffic impacts under CEQA. Because the City of Sebastopol has not yet adopted standards of significance for evaluating VMT, guidance provided by the California Governor's Office of Planning and Research (OPR) in the publication *Transportation Impacts (SB 743) CEQA Guidelines Update and Technical Advisory*, 2018, was used (referred to herein as the Technical Advisory). These criteria are consistent with those applied by Caltrans as outlined in the *Vehicle Miles Traveled-Focused Transportation Impact Study Guide*, California Department of Transportation, May 2020.

Significance Threshold

The OPR Technical Advisory provides VMT threshold guidance for several land use types. Residential uses are assessed using a home-based VMT per capita metric, with VMT significance thresholds set at a level of 15 percent below the citywide or regional average. The Technical Advisory indicates that it may be appropriate to apply a countywide, rather than regional, average if most people both live and work within the smaller geographic area. According to data contained in the *Sonoma County Travel Behavior Study*, SCTA, 2020, approximately 98 percent of Sebastopol's vehicle trips remain within Sonoma County. Use of a common model to produce both project-level and threshold values also allows for a clear "apples to apples" assessment. Accordingly, the applied significance threshold was based on the Sonoma County per-capita VMT average rather than the nine-County Bay Area regional average.

SCTA operates and maintains the regional travel demand model that produces baseline VMT estimates. The VMT thresholds and projections applied in this analysis reflect the SCTM19 model updated in December 2021, which remains the current version as of the August 2023 timeframe of this analysis. Based on output from the SCTA model, the existing average residential VMT per capita in the County of Sonoma is 16.60 miles. VMT significance thresholds are set at 15 percent below this level, or 14.11 miles. Accordingly, the project would have a potentially significant impact on VMT if its projected residential VMT per Capita exceeds 14.11 miles.

Project VMT Assessment

VMT per Capita

The SCTA model includes traffic analysis zones (TAZ) covering geographic areas throughout Sonoma County. The Canopy project site is located within TAZ 803, which has a baseline VMT per capita of 15.57 miles. Based on the model, for the project to achieve the applied threshold of 15 percent below the Countywide average, its projected VMT per capita would need to be reduced by 9.4 percent.

Consideration was given to whether adjustments to the baseline per-capita VMT estimates produced by the SCTA model are warranted to reflect project-specific details. The most common adjustments pertain to project density, provision of affordable housing, mix of uses, and off-site improvements to non-auto travel networks. The publication *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*, California Air Pollution Control Officers Association (CAPCOA), 2021, includes a methodology to determine the VMT reductions associated with increases in residential density. Per the CAPCOA methodology, a minimum density of 9.1 units per acre would need to be achieved before VMT reduction benefits could be realized. The residential density of the proposed project is 15.7 dwelling units per acre and applying the CAPCOA density methodology results in a VMT reduction of 16.05 percent, or 2.5 VMT. Applying this percentage reduction yields an adjusted VMT value of 13.07, which is below the threshold of 14.11, and therefore does not yield a significant project impact for VMT. Table 4 shows a summary of the VMT analysis.

Table 4 – Vehicle Miles Traveled Analysis Summary				
VMT Metric	**Baseline VMT Rate (Countywide Avg)**	**Significance Threshold (15% Below Countywide Avg)**	**Project VMT per Capita**	
			Project Site TAZ 803[1]	**Meets Threshold?**
Residential VMT per Capita (Countywide Baseline)	16.60	14.11	15.57	No
Applicable VMT Reduction	**Baseline Density (Countywide Avg)**	**Project Density**	**Calculated VMT Reduction**	**Adjusted VMT**
Higher Density Residential	9.1 du/acre	15.7 du/acre	16.05%	13.07

Notes: VMT Rate is measured in VMT per Capita, or the number of daily miles driven per resident; TAZ=Traffic Analysis Zone[1]; du/acre=dwelling units per acre

Significance Finding – Applying an allowable residential density reduction of 16.05 percent to the project VMT reduces the VMT impact of the project to a less-than-significant level. The project is expected to meet the applicable significance threshold for vehicle miles traveled.

Safety Issues

The potential for the project to impact safety was evaluated in terms of the adequacy of sight distance and need for turn lanes at the project access locations, as well as the adequacy of stacking space in left-turn lanes at the study intersections. This section addresses the third transportation bullet on the CEQA checklist which is whether or not the project would substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

Site Access

Primary access to the site would be provided at two locations: by an existing private drive that links the existing office development adjacent to the project to Mill Station Road and via the southernmost drive aisle of the office development's parking lot. A new curb cut and driveway would be created at the southernmost point of this drive aisle to provide more direct access to SR 116.

Sight Distance

Sight distances along SR 116 at the proposed new project driveway at the southernmost parking lot drive aisle were evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. Though Caltrans does not indicate a recommended sight distance for driveways in urban areas, for safety reasons the stopping sight distance was evaluated using the approach travel speed as the basis for determining the recommended sight distance. Additionally, the stopping sight distance needed for a following driver to stop if there is a vehicle waiting to turn into a side street or driveway was evaluated based on the stopping sight distance criterion and approach speed on the major street. Based on a posted speed of 35 mph for SR 116, the minimum stopping sight distance needed is 250 feet.

Field measurements indicate that sight distance at the driveways on SR 116 is over 300 feet in each direction and exceeds the stopping sight distance needed for vehicles traveling five mph above the posted speed limit of 35 mph. The sight distance at the private driveway location on Mill Station Road was field measured at 100 feet in each direction and does not meet the stopping sight distance requirement of 200 feet in each direction for five mph over the *prima facie* speed limit of 25 mph. As landscaping and signage can impede sight lines, any landscaping or signage placed within the vision triangle at the driveway should be less than three feet or more than seven feet above the pavement surface to maintain a clear line of sight.

Significance Finding – Sufficient sight distance is anticipated to be available at the new driveway created by the project at the southernmost drive aisle of the existing office park parking lot. However, existing sight distance at the driveway intersection at Mill Station Road would need to be increased to 200 feet in each direction in order to be deemed sufficient.

Emergency Access

The final transportation bullet on the CEQA checklist requires an evaluation as to whether the project would result in inadequate emergency access or not.

Adequacy of Site Access

As noted above, the project site would be accessed by an existing private road that connects to Mill Station Road to the northwest of the project site and by the access easement via the southernmost drive aisle of the parking lot of the adjacent development as well as a new driveway on SR 116 at the end of the project access drive aisle to provide direct access from the project to the street. The project would include a small private internal street network with a minimum travel width of 24 feet. This network and the parking stalls located therein appear to be in accordance with City design standards. Site access and circulation is therefore expected to function acceptably for emergency response vehicles.

Additionally, the nominal increase in traffic volumes resulting from the project can reasonably be expected to result in similarly nominal changes to traffic delays in the area. Since emergency responders can claim the right-of-way through use of their lights and sirens, the addition of project-generated traffic would be expected to have little to no impact on emergency response times.

Significance Finding – The project would have a less-than-significant impact on emergency response.

Capacity Analysis

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM) *Sixth Edition*, Transportation Research Board, 2018. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The Levels of Services for the intersections with side street stop controls, or those which are unsignalized and have one or two approaches stop controlled, were analyzed using the "Two-Way Stop-Controlled" intersection capacity method from the HCM. The methodology determines a level of service for each minor turning movement by estimating the average delay in seconds per vehicle. Results are presented for the stop-controlled approaches together with the weighted overall average delay for the intersection.

The study intersections that are currently or planned to be controlled by a traffic signal were evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether the signals are coordinated or not, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using signal timing obtained from Caltrans. Adjustments were made to signal timing under Future conditions to account for changes in demand patterns that would be typically addressed by periodic retiming.

Intersections that are proposed to be controlled by modern roundabouts were evaluated using the Federal Highway Administration (FHWA) Roundabout Method, also contained within the Unsignalized Methodology of the HCM. This methodology determines intersection operation using a gap acceptance method along with basic geometric and volume data to calculate entering and circulating flows. This information is then translated to average vehicle delays, with LOS break points at the same delays as used in the two-way stop-controlled methodology.

The ranges of delay associated with the various levels of service are indicated in Table 5.

Agenda Item 3 Number

Table 5 – Intersection Level of Service Criteria			
LOS	**Two-Way Stop-Controlled**	**Roundabout**	**Signalized**
A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.	Delay of 0 to 10 seconds.	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
B	Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.	Delay of 10 to 15 seconds.	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
C	Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street.	Delay of 15 to 25 seconds.	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
D	Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.	Delay of 25 to 35 seconds.	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles must stop.
E	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.	Delay of 35 to 50 seconds.	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop, and drivers consider the delay excessive.
F	Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues.	Delay of more than 50 seconds.	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Reference: *Highway Capacity Manual*, Transportation Research Board, 2018

Traffic Operation Standards

Caltrans

All of the study intersections are under the jurisdiction of Caltrans, but Caltrans does not have a standard of significance relative to operation as this is no longer a CEQA issue. The *Vehicle Miles Traveled-Focused Transportation Impact Study Guide* (TISG), published in May 2020, replaced the *Guide for the Preparation of Traffic Impact Studies*, 2002. As indicated in the TISG, the Department is transitioning away from requesting LOS or other vehicle operation analyses of land use projects and will instead focus on Vehicle Miles Traveled (VMT). Adequacy of operation was therefore evaluated using the County's standards for the study intersection in Sonoma County (SR 116/Occidental Road) and using the City of Sebastopol's standards for the remaining five study intersections that are within City limits.

County of Sonoma

The Level of Service standard for intersections in Sonoma County is Level of Service D according to the *Sonoma County General Plan 2020* Policy CT-4.2. Based on the most recent criteria published by the County of Sonoma in May 2016 and updated in June 2019, the project would have an adverse effect on operation at SR 116/Occidental Road if it results in any of the following conditions:

- Project traffic would cause an intersection currently operating at an acceptable level of service (LOS D or better) to operate below the standard (LOS E or F).
- If the intersection currently operates or is projected to operate below the County standard (at LOS E or F), project traffic causes the average delay to increase by five seconds or more. The delay will be determined by comparing intersection operation with and without the project's traffic for both the existing and projected

future conditions. This criterion applies to all controlled intersections except for driveways and minor side streets that have less than 30 vehicle trips per hour per approach or exclusive left turn movement.

City of Sebastopol

The following criteria referenced in the *Draft Environmental Impact Report* (DEIR) *for the 2016 Sebastopol General Plan Update*, May 2016, De Novo Planning Group, were applied in order to determine if the project would have an adverse effect on operation at the five study intersections within the City limits:

- Utilize a Level of Service objective of LOS D at intersections to evaluate conditions and impacts, with primary focus on access and safety.
- At signalized intersections, levels of service shall be determined for the overall intersection.
- At unsignalized intersections, level of service shall be determined for both controlled movements and for the overall intersection. Controlled movements operating at LOS E or F would be considered acceptable if:
  - The intersection is projected to operate at LOS D or better overall; and
  - The projected traffic volume on the controlled movement is relatively low (30 vehicles or less per hour on approaches with single lanes, 30 vehicles or less per hour on lanes serving left turns and through movements).
- For intersections already operating worse than LOS objectives, development projects should not contribute substantially to further decline in LOS (causing the LOS to decline by a letter grade from LOS E to LOS F) or by more than a five percent increase in delay for intersections currently operating at an unacceptable LOS.

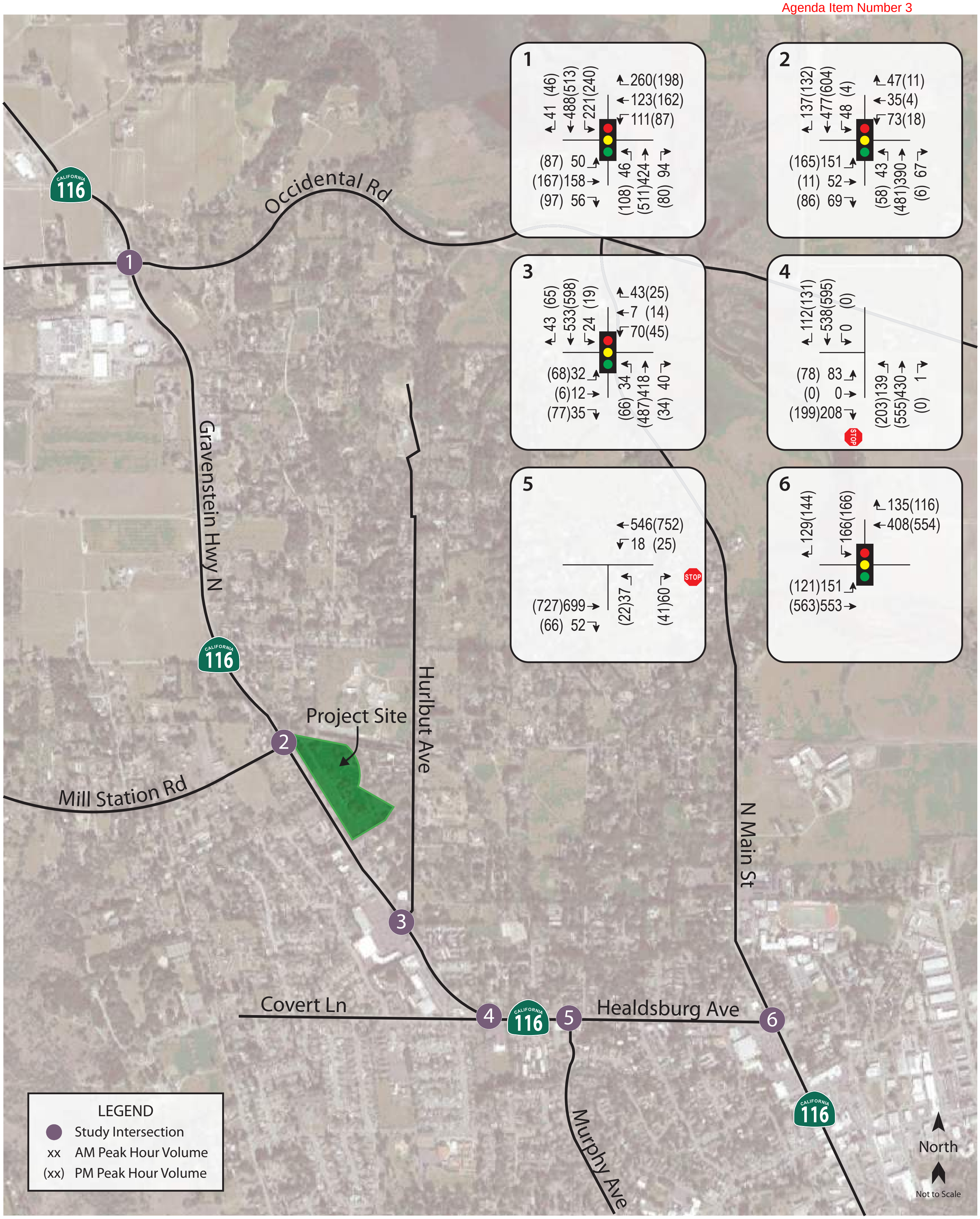
While not explicitly stated in the DEIR, it was also considered an adverse effect on operations if project traffic would cause an intersection operating acceptably at LOS D or better to operate unacceptably at LOS E or F. It is also noted Policy CIR 1-5 of the *Sebastopol General Plan*, November 2016, De Novo Planning Group, states that “when analyzing impacts to the circulation network created by new development or roadway improvements, consider the needs of all users, including those with disabilities, ensuring that pedestrians, bicyclists, and transit riders are considered preeminent to automobile drivers.” In other words, there should be careful review to ensure that automobile improvements do not negatively affect the experiences of pedestrians, bicyclists, and transit riders.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the a.m. and p.m. peak periods. This condition does not include project-generated traffic volumes. Existing traffic counts were obtained for the study intersections in late May 2023 while area schools were in session.

Under existing conditions, four of the six study intersections are operating acceptably while the intersection of SR 116/Occidental Road operates unacceptably at LOS F during both peak hours and SR 116/North Main Street operates unacceptably at LOS E during the p.m. peak hour. It is noted that the signal at SR 116/North Main Street includes an exclusive pedestrian phase which cannot be directly modeled using the HCM methodology, and thus the pedestrian phase was modeled as a northbound vehicle phase. The average vehicle delay and LOS for each scenario at SR 116 (Healdsburg Avenue-North Main Street)/North Main Street is contained in an additional spreadsheet in Appendix B in which the delay experienced by pedestrians was removed from the calculations.

The existing traffic volumes are shown in Figure 3. A summary of the intersection Level of Service calculations is presented in Table 6, and copies of the calculations are provided in Appendix B.



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Transportation Impact Study for The Canopy Project

Figure 3 – Existing Traffic Volumes

W-Trans

Table 6 – Existing Peak Hour Intersection Levels of Service				
Study Intersection	**AM Peak**		**PM Peak**	
Approach	**Delay**	**LOS**	**Delay**	**LOS**
1. SR 116/Occidental Rd	**109**	**F**	**123**	**F**
Add EBL/WBL Lanes with protected Phasing, WBR OL	**57.7**	**E**	**59.7**	**E**
Add EBL /WBL Lanes with protected Phasing, Add EBR Lane and WBR Overlap	48.2	D	49.8	D
With Roundabout	26.8	D	33.1	D
2. SR 116/Mill Station Rd	38.0	D	28.2	C
3. SR 116/Hurlbut Ave	20.9	C	23.9	C
4. SR 116/Covert Ln	5.5	A	4.9	A
Eastbound (Covert Ln) Approach	*21.8*	*C*	*22.0*	*C*
5. SR 116/Murphy Ave	1.7	A	0.9	A
Northbound (Murphy Ave) Approach	*23.1*	*C*	*20.3*	*C*
6. SR 116/N Main St	46.7	D	**56.8**	**E**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation; Shaded cells = conditions with indicated modifications

The following capacity measures to decrease delay and improve operation of the two intersections operating unacceptably were analyzed.

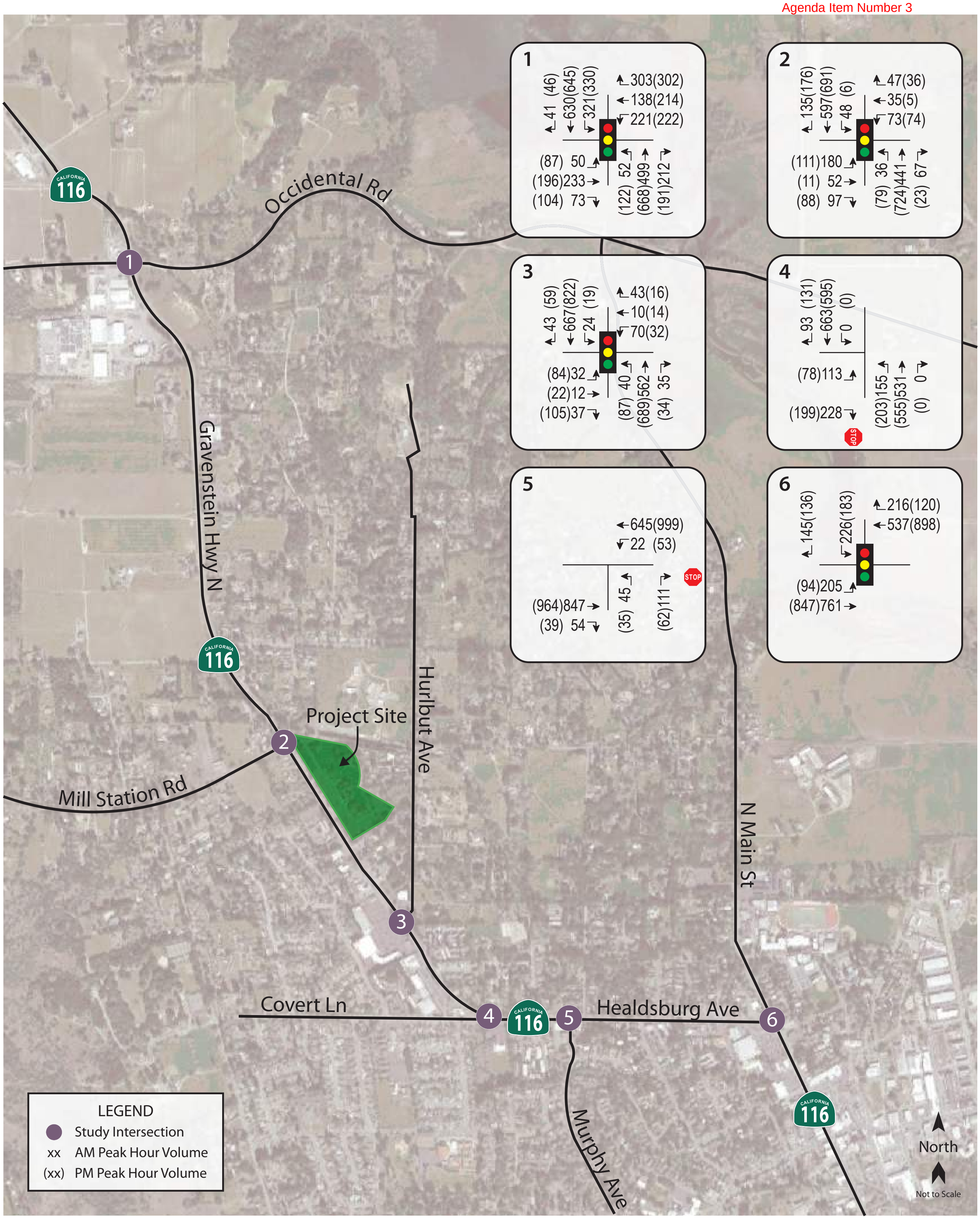
- SR 116 (Gravenstein Highway North)/Occidental Road
  - Add 200-foot-long left-turn pockets on the eastbound and westbound approaches.
  - Convert the existing split phasing to protected left-turn phasing on the eastbound and westbound approaches.
  - Install a westbound right-turn overlap phase.

The intersection would continue operating unacceptably at LOS E with these modifications despite the reduction in delay. Adding a 200-foot-long eastbound right-turn lane to the above changes or installing a single-lane roundabout would both result in acceptable operation of LOS D.

Future Conditions

Future intersection turning movements for five of the six study intersections were obtained from the Circulation Element of the *Sebastopol General Plan*, while future turning movements at SR 116/Occidental Road were developed using the "Furness" method and segment volumes for the horizon year of 2040 from the SCTA traffic model. The Furness method is an iterative process that employs existing turn movement data, existing link volumes, and future link volumes to project likely future turning movement volumes at intersections. In accordance with Action CIR 1d of the General Plan and *City of Sebastopol SR 116 Safety Study*, 2021, W-Trans, a roundabout at SR 116/Covert Lane was assumed to be completed by 2040. It is noted that a roundabout project is not currently a part of the City or Caltrans' Capital Improvement Program (CIP); however, the City will be pursuing a roundabout concept and potential funding sources at this location in cooperation with Caltrans later in the coming year.

Under anticipated Future volumes and with the addition of a roundabout at SR 116/Covert Lane, four of the six intersections are expected to operate acceptably. The intersection of SR 116/Occidental Road is expected to operate unacceptably at LOS F during both peak hours and SR 116/North Main Street is expected to operate unacceptably at LOS E during the p.m. peak hour. Future volumes are shown in Figure 4 and operating conditions are summarized in Table 7, and copies of the calculations are provided in Appendix B.



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Transportation Impact Study for The Canopy Project

Figure 4 – Future Traffic Volumes

W-Trans

Table 7 – Future Peak Hour Intersection Levels of Service				
Study Intersection	**AM Peak**		**PM Peak**	
Approach	**Delay**	**LOS**	**Delay**	**LOS**
1. SR 116/Occidental Rd	**235**	**F**	**225**	**F**
Add EBL/WBL Lanes, Protected LT Phasing, WBR Overlap	**158**	**F**	**130**	**F**
Add EBL /WBL Lanes, Protected LT Phasing, WBR Lane, and WBR OL	**134**	**F**	**109**	**F**
With Roundabout	**176**	**F**	**176**	**F**
2. SR 116/Mill Station Rd	36.0	D	33.9	D
3. SR 116/Hurlbut Ave	24.0	C	29.0	C
4. SR 116/Covert Ln	11.4	B	22.6	C
5. SR 116/Murphy Ave	2.8	A	1.8	A
Northbound (Murphy Ave) Approach	*29.8*	*D*	*34.1*	*D*
6. SR 116/N Main St	51.5	D	**62.4**	**E**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = deficient operation; Shaded cells = conditions with indicated modifications

Adding 200-foot-long left-turn pockets on the east and west legs, protected left-turn phasing on the eastbound and westbound approaches, and a westbound right-turn overlap phase to SR 116/Occidental Road or converting the intersection to a roundabout would be expected to decrease delay at the intersection under Future conditions; however, the intersection would continue operating unacceptably at LOS F during both peak hours as it also would under each improvement scenario.

Project Conditions

Trip Generation

The anticipated vehicle trip generation for the proposed project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 11th Edition, 2021. Since the site is currently undeveloped, no existing trips were analyzed. The trip generation potential of the project as planned was developed using the published standard rates for Single Family Attached Housing (Land Use #215) and Multifamily Housing (Low-Rise) (Land Use #220), as the description of these land uses most closely matches the proposed project.

The number of residential units analyzed is 96, which includes 80 condominiums and 16 potential ADUs. Based upon the application of these assumptions, the proposed project is expected to generate an average of 684 trips per day, including 44 a.m. peak hour trips and 54 trips during the p.m. peak hour on a typical weekday. These results are summarized in Table 8.

Table 8 – Trip Generation Summary												
Land Use	**Units**	**Daily**		**AM Peak Hour**				**PM Peak Hour**				
		Rate	**Trips**	**Rate**	**Trips**	**In**	**Out**	**Rate**	**Trips**	**In**	**Out**	
Single Family (Attached)	80 du	7.20	576	0.48	38	10	28	0.57	46	27	19	
Multifamily Housing	16 du	6.74	108	0.40	6	2	4	0.51	8	5	3	
Total			**684**		**44**	**12**	**32**		**54**	**32**	**22**	

Note: du = dwelling unit

Trip Distribution

The distribution pattern used to allocate new project trips to the street network was determined by reviewing existing turning movements at the study intersections as well as employment patterns for residents of the City of Sebastopol, as indicated by the 2010 Census. Since traffic conditions are generally most critical during the weekday p.m. peak hour, these distribution assumptions are primarily based on the expected trip routes during that time. The distribution assumptions shown in Table 9 were used.

Table 9 – Trip Distribution Assumptions				
Route	**Percent**	**Daily Trips**	**AM Trips**	**PM Trips**
Occidental Rd (To/From the East)	20%	137	9	11
Occidental Rd (To/From the West)	5%	34	2	3
SR 116 (To/From the North)	10%	68	4	5
SR 116 (To/From the South)	40%	275	18	22
Mill Station Rd (To/From the West)	5%	34	2	3
Covert Ln (To/From the West)	10%	68	4	5
N. Main St (To/From the North)	10%	68	4	5
TOTAL	**100%**	**684**	**44**	**54**

Existing plus Project Conditions

Upon the addition of project-generated traffic to the existing volumes, four of six study intersections are expected to continue operating acceptably while the intersection of SR 116/Occidental Road would continue operating unacceptably at LOS F during both peaks and SR 116/North Main Street would continue operating unacceptably at LOS E during the p.m. peak hour. Project traffic volumes are shown in Figure 5 and Existing plus Project volumes are shown in Figure 6. The analysis results are summarized in Table 10, and copies of the calculations are provided in Appendix B.

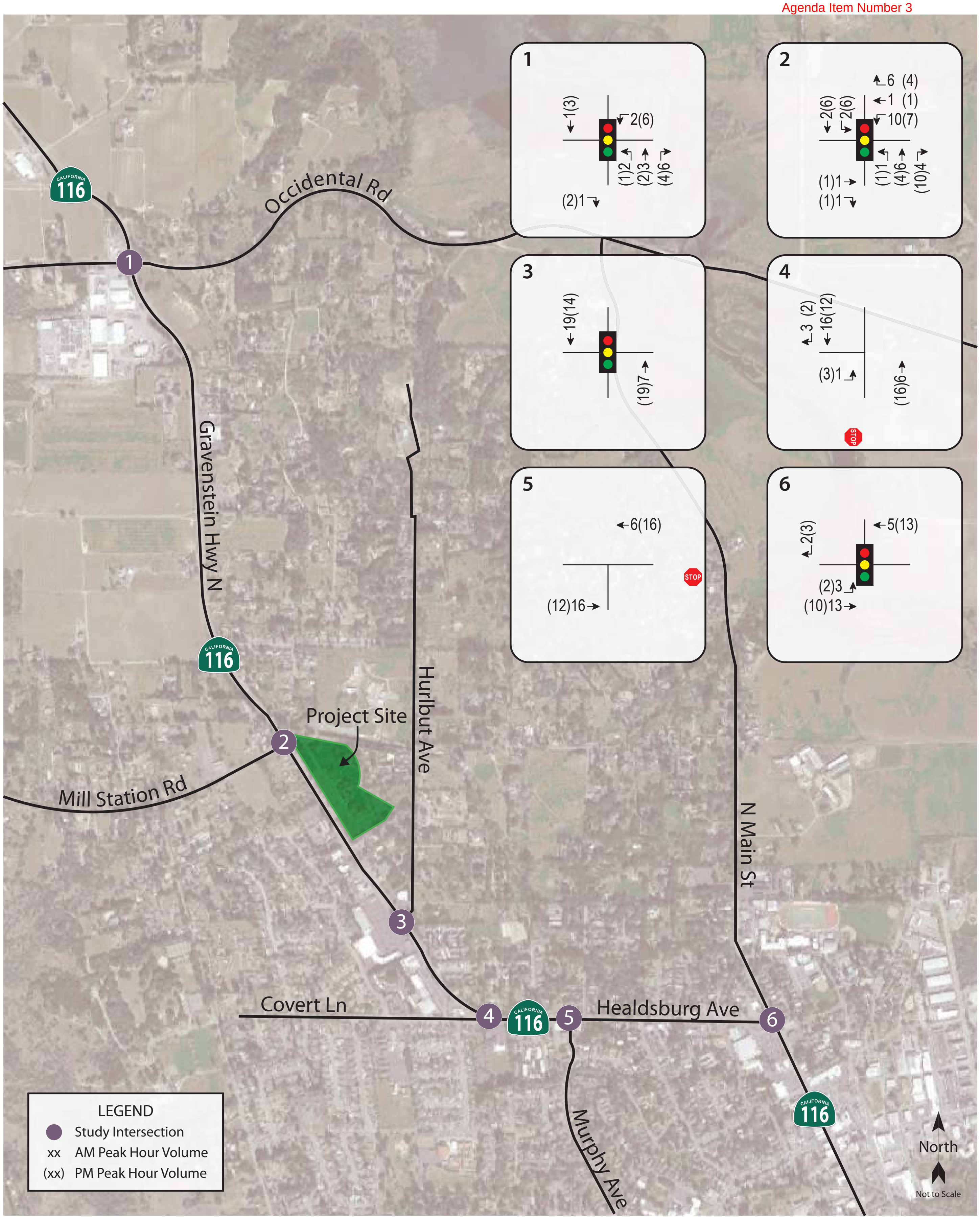

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Figure 5 – Project Traffic Volumes

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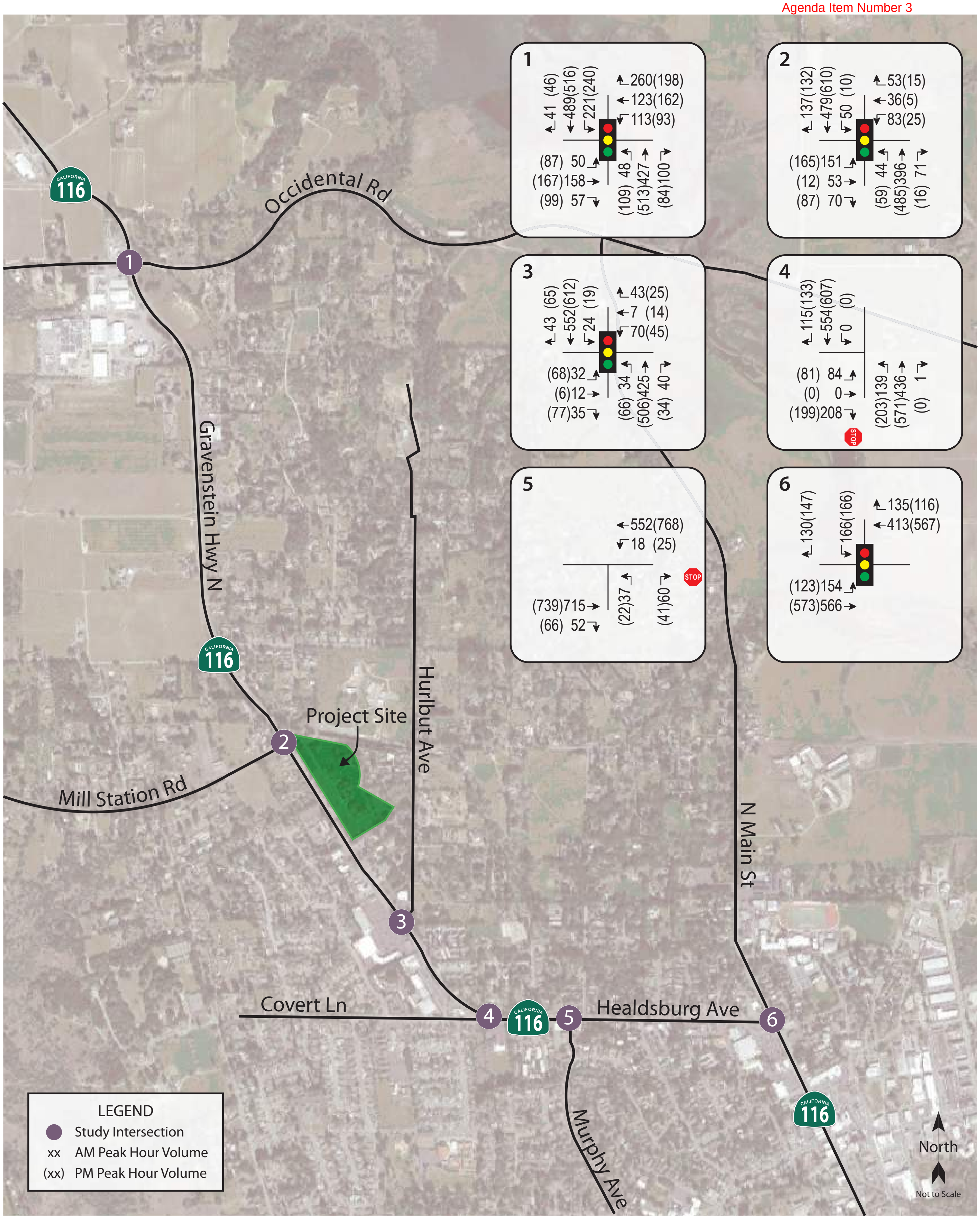

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Figure 6 – Existing plus Project Traffic Volumes

W-Trans

Table 10 – Existing and Existing plus Project Peak Hour Intersection Levels of Service

Study Intersection *Approach*	**Existing Conditions**				**Existing plus Project**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. SR 116/Occidental Rd	**109**	**F**	**123**	**F**	**113**	**F**	**127**	**F**
Add EBL/WBL Lanes, Protected LT Phasing, and WBR Overlap	**57.7**	**E**	**59.7**	**E**	**59.9**	**E**	**61.3**	**E**
Add EBL/WBL Lanes, Protected LT Phasing, WBR Lane and WBR Overlap	48.2	D	49.8	D	46.7	D	47.6	D
With Roundabout	26.8	D	33.1	D	27.8	D	34.5	D
2. SR 116/Mill Station Rd	38.0	D	28.2	C	38.7	D	31.6	C
3. SR 116/Hurlbut Ave	20.9	C	23.9	C	21.7	C	24.7	C
4. SR 116/Covert Ln	5.5	A	4.9	A	5.6	A	5.1	A
Eastbound (Covert Ln) Approach	*21.8*	*C*	*22.0*	*C*	*22.6*	*C*	*22.8*	*C*
5. SR 116/Murphy Ave	1.7	A	0.9	A	1.7	A	0.9	A
Northbound (Murphy Ave) Approach	*23.1*	*C*	*20.3*	*C*	*23.6*	*C*	*20.7*	*C*
6. SR 116/N Main St	46.7	D	**56.8**	**E**	47.8	D	**61.0**	**E**
With Signal Timing Optimization	-		-		-		54.5	D

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = deficient operation; Shaded cells = conditions with indicated modifications

Adding 200-foot-long left-turn lanes on the eastbound and westbound approaches, protected left-turn phasing, and a westbound right-turn overlap phase to SR 116/Occidental Road would reduce delay substantially, but the intersection would continue operating unacceptably at LOS E with or without project trips. Adding a 200-foot-long eastbound right-turn lane with the above modifications or installing a single-lane roundabout would result in acceptable operation under Existing plus Project volumes. The project would add less than five seconds of delay at SR 116/Occidental Road and would not cause a deterioration in the service level; therefore, the project would not cause an adverse effect on existing operations per the County's standards.

The project would result in a greater than a five percent increase in average delay at SR 116/North Main Street, which would operate unacceptably at LOS E during the p.m. peak hour without or with the project. As a result, this is considered an adverse project impact under the City's standards. Optimizing the signal's cycle length and splits to accommodate project trips would result in an improved LOS D. Therefore, it is recommended that the project applicant contribute to the City's Traffic Impact Fee (TIF) that could be used to adjust the signal's timing since the intersection is located near downtown with no right-of-way available for capacity enhancements.

Finding – Four of the six study intersections would be expected to operate acceptably with the addition of project traffic to existing volumes while the intersections of SR 116/Occidental Road and SR 116/North Main Street would operate unacceptably with or without the project. The project would result in a greater than five percent increase in delay at SR 116/North Main Street during the p.m. peak hour, resulting in an adverse effect per the County's standards.

Recommendation – The project applicant should contribute to the City of Sebastopol TIF that could be used to re-time the signal at SR 116/North Main Street to optimize operation.

Future plus Project Conditions

Upon the addition of project-generated traffic to the anticipated future volumes, and with a roundabout installed at SR 116/Covert Lane, four of the study intersections are expected to operate acceptably. Future plus Project intersection operations are summarized in Table 11, and volumes are shown in Figure 7. Copies of the calculations are provided in Appendix B.

Table 11 – Future and Future plus Project Intersection Levels of Service

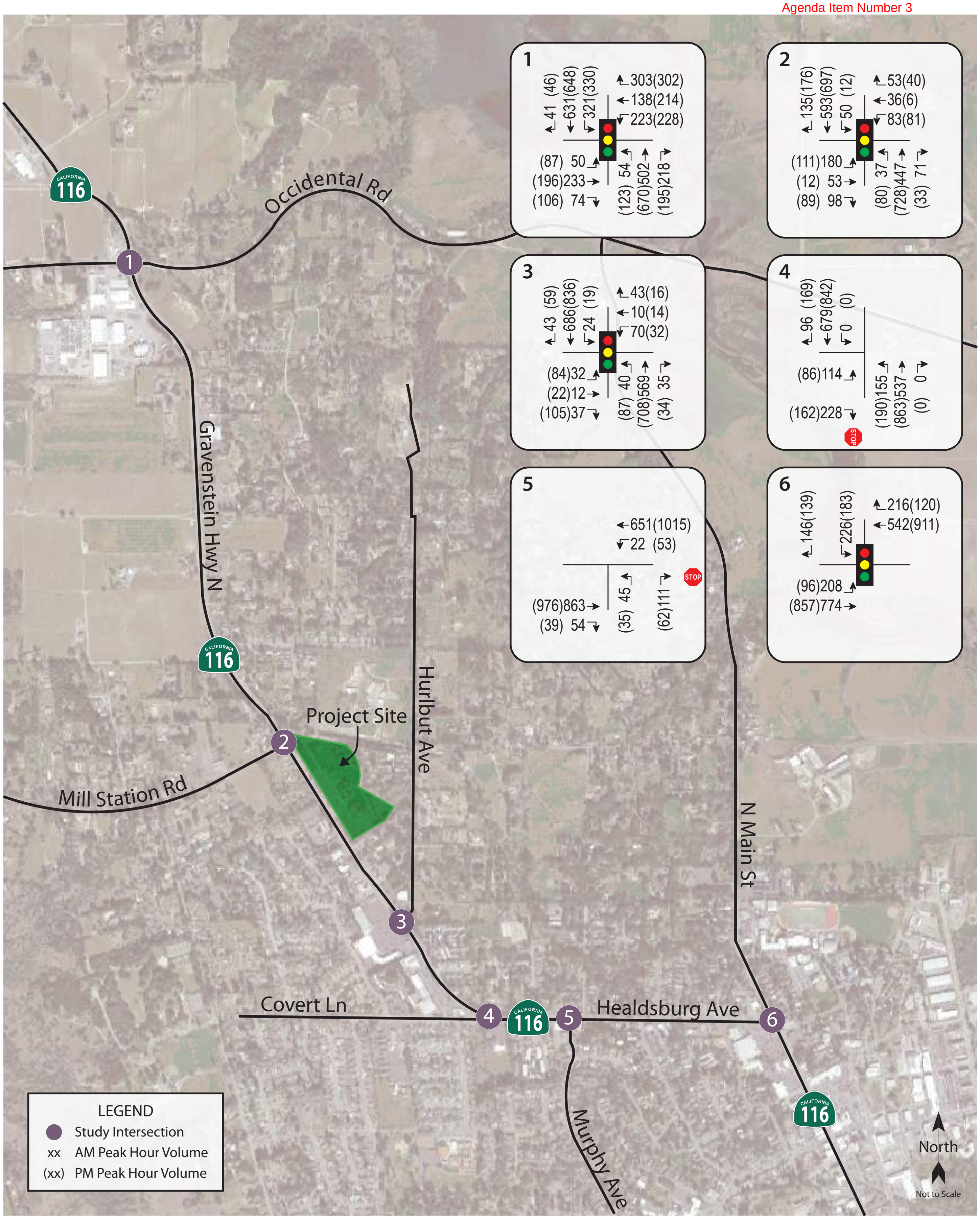
Study Intersection	Future Conditions				Future plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 116/Occidental Rd	**235**	**F**	**225**	**F**	**239**	**F**	**229**	**F**
Add EBL/WBL Lanes, Protected EBL/WBL Phasing, and WBR Overlap	**158**	**F**	**130**	**F**	**161**	**F**	**133**	**F**
Add EBL/WBL Lanes, Protected LT Phasing, WBR Lane and WBR Overlap	**134**	**F**	**109**	**F**	**137**	**F**	**111**	**F**
With Roundabout	**176**	**F**	**176**	**F**	**181**	**F**	**182**	**F**
2. SR 116/Mill Station Rd	36.0	D	33.9	D	36.8	D	35.1	D
3. SR 116/Hurlbut Ave	24.0	C	29.0	C	25.1	C	30.2	C
4. SR/Covert Ln	11.4	B	22.6	C	11.8	B	23.9	C
5. SR 116/Murphy Ave	2.8	A	1.8	A	2.9	A	1.8	A
Northbound (Murphy Ave) Approach	*29.8*	*D*	*34.1*	*D*	*30.8*	*D*	*35.1*	*E*
6. SR 116/N Main St	51.5	D	**62.4**	**E**	52.5	D	**64.9**	**E**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** = Unacceptable operation; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; Shaded cells = conditions with indicated modifications

The intersections of SR 116/Occidental Road and SR 116/North would continue operating unacceptably with the addition of project traffic; however, as the anticipated increases in overall delay would be less than five seconds for SR 116 /Occidental Road and less than five percent for SR 116/North Main Street, the project's effects would be considered acceptable.

The addition of left-turn lanes and protected left-turn phasing on the eastbound and westbound approaches to SR 116/Occidental Road, as well as a westbound right-turn overlap phase, would reduce delay while still resulting in LOS F. Installing a 200-foot-long eastbound right-turn lane along with the above changes would further reduce delay, while a single-lane roundabout at the intersection would be expected to have the least benefit in terms of reduced delay.

Finding – Four of the six study intersections would be expected to operate acceptably with the addition of project trips to future volumes while the intersections of SR 116/Occidental Road and SR 116/North Main Street would operate unacceptably under Future plus Project volumes or without project traffic added.



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Transportation Impact Study for The Canopy Project

Figure 7 – Future plus Project Traffic Volumes

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Conclusions and Recommendations

Conclusions

- The proposed project is expected to generate an average of 684 trips per day, including 44 a.m. peak hour trips and 54 trips during the p.m. peak hour on a typical weekday.
- The existing and planned pedestrian, bicycle, and transit facilities provide adequate access to and from the project site and the project does not conflict with any policies, plans or programs for these modes.
- The project is expected to meet the applicable significance threshold for vehicle miles traveled.
- Sufficient sight distance is anticipated to be available at the new driveway created by the project. However, existing sight distance at the driveway intersection at Mill Station Road would need to be increased to 200 feet in each direction in order to be deemed sufficient.
- The proposed roadway network, including connectivity to existing streets, would provide adequate emergency circulation and access from a transportation perspective.
- The project would be subject to review and approval by the City's Fire Marshal; any requirements imposed by the Fire Marshal shall take precedence over the emergency access and circulation findings contained herein.
- Under existing conditions with and without the Project, four of the six study intersections are operating acceptably while the intersection of SR 116/Occidental Road operates unacceptably at LOS F during both peak hours and SR 116/North Main Street operates unacceptably at LOS E during the p.m. peak hour.
- Four of the six study intersections would be expected to operate acceptably with the addition of project trips to future volumes while the intersections of SR 116/Occidental Road and SR 116/North Main Street would operate unacceptably under Future plus Project conditions.
- The addition of left-turn lanes and protected left-turn phasing on the eastbound and westbound approaches to SR 116/Occidental Road, as well as a westbound right-turn overlap phase, would reduce delay while still resulting in LOS F operation. Installing a 200-foot-long eastbound right-turn lane along with the above changes would further reduce delay, while a single-lane roundabout at the intersection would be expected to cause the smallest reductions in delay.

Recommendations

- The project applicant should contribute to the City of Sebastopol TIF. Such monies could be used to re-time the signal at SR 116/North Main Street to minimize delay.

Study Participants and References

Study Participants

Principal in Charge	Steve Weinberger, PE, PTOE
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Quality Control	Dalene J. Whitlock, PE, PTOE

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Appendix A

Collision Rate Calculations

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Intersection Collision Rate Worksheet

The Canopy EIR

Intersection # 1: SR 116 (Gravenstein Highway North) & Occidental Road
Date of Count: Thursday, May 25, 2023

Number of Collisions: 12
Number of Injuries: 2
Number of Fatalities: 0
Average Daily Traffic (ADT): 23000
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Stop & Yield Controls
Area: Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{12 \quad x \quad 1{,}000{,}000}{23{,}000 \quad x \quad 365 \quad x \quad 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.29 c/mve**	**0.0%**	**16.7%**
Statewide Average*	**0.20 c/mve**	**1.1%**	**47.5%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Intersection # 2: SR 116 (Gravenstein Highway North) & Mill Station Road
Date of Count: Thursday, May 25, 2023

Number of Collisions: 4
Number of Injuries: 2
Number of Fatalities: 0
Average Daily Traffic (ADT): 15800
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{4 \quad x \quad 1{,}000{,}000}{15{,}800 \quad x \quad 365 \quad x \quad 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.14 c/mve**	**0.0%**	**50.0%**
Statewide Average*	**0.33 c/mve**	**0.6%**	**47.7%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Intersection Collision Rate Worksheet

The Canopy EIR

Intersection # 3: SR 116 (Gravenstein Highway North) & Hurlbut Avenue
Date of Count: Thursday, May 25, 2023

Number of Collisions: 5
Number of Injuries: 3
Number of Fatalities: 0
Average Daily Traffic (ADT): 15000
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions} \times 1\text{ Million}}{\text{ADT} \times \text{Days per Year} \times \text{Number of Years}}$$

$$\text{Collision Rate} = \frac{5 \times 1{,}000{,}000}{15{,}000 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.18 c/mve**	**0.0%**	**60.0%**
Statewide Average*	**0.33 c/mve**	**0.6%**	**47.7%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Intersection # 4: SR 116 (Healdsburg Avenue) & Covert Lane
Date of Count: Thursday, May 25, 2023

Number of Collisions: 7
Number of Injuries: 5
Number of Fatalities: 0
Average Daily Traffic (ADT): 17600
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls
Area: Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions} \times 1\text{ Million}}{\text{ADT} \times \text{Days per Year} \times \text{Number of Years}}$$

$$\text{Collision Rate} = \frac{7 \times 1{,}000{,}000}{17{,}600 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.22 c/mve**	**0.0%**	**71.4%**
Statewide Average*	**0.13 c/mve**	**1.3%**	**47.3%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Intersection Collision Rate Worksheet

The Canopy EIR

Intersection # 5: SR116 (Healdsburg Avenue) & Murphy Avenue
Date of Count: Thursday, May 25, 2023

Number of Collisions: 4
Number of Injuries: 2
Number of Fatalities: 0
Average Daily Traffic (ADT): 16300
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls
Area: Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{4 \times 1{,}000{,}000}{16{,}300 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.13 c/mve**	**0.0%**	**50.0%**
Statewide Average*	**0.13 c/mve**	**1.3%**	**47.3%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Intersection # 6: SR 116 (Healdsburg Avenue) & North Main Street
Date of Count: Thursday, May 25, 2023

Number of Collisions: 6
Number of Injuries: 1
Number of Fatalities: 0
Average Daily Traffic (ADT): 16700
Start Date: January 1, 2015
End Date: December 31, 2022
Number of Years: 8

Intersection Type: Tee
Control Type: Signals
Area: Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{6 \times 1{,}000{,}000}{16{,}700 \times 365 \times 8}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.12 c/mve**	**0.0%**	**16.7%**
Statewide Average*	**0.28 c/mve**	**0.9%**	**49.1%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Appendix B

Intersection Level of Service Calculations

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HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	158	56	111	123	260	46	424	94	221	488	41
Future Volume (veh/h)	50	158	56	111	123	260	46	424	94	221	488	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	184	55	129	143	0	53	493	100	257	567	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	62	198	59	139	154	254	102	403	82	238	587	47
Arrive On Green	0.20	0.20	0.20	0.18	0.18	0.00	0.06	0.30	0.30	0.15	0.38	0.38
Sat Flow, veh/h	313	994	297	775	859	1418	1594	1349	274	1594	1530	121
Grp Volume(v), veh/h	297	0	0	272	0	0	53	0	593	257	0	612
Grp Sat Flow(s),veh/h/ln	1604	0	0	1635	0	1418	1594	0	1623	1594	0	1652
Q Serve(g_s), s	24.4	0.0	0.0	22.0	0.0	0.0	4.3	0.0	40.0	20.0	0.0	48.6
Cycle Q Clear(g_c), s	24.4	0.0	0.0	22.0	0.0	0.0	4.3	0.0	40.0	20.0	0.0	48.6
Prop In Lane	0.20		0.19	0.47		1.00	1.00		0.17	1.00		0.07
Lane Grp Cap(c), veh/h	320	0	0	292	0	254	102	0	485	238	0	634
V/C Ratio(X)	0.93	0.00	0.00	0.93	0.00	0.00	0.52	0.00	1.22	1.08	0.00	0.97
Avail Cap(c_a), veh/h	335	0	0	293	0	254	190	0	485	238	0	634
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	0.0	0.0	54.2	0.0	0.0	60.7	0.0	47.0	57.0	0.0	40.4
Incr Delay (d2), s/veh	31.3	0.0	0.0	35.0	0.0	0.0	1.5	0.0	117.9	81.3	0.0	27.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	0.0	0.0	11.7	0.0	0.0	1.8	0.0	31.4	13.2	0.0	23.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.0	0.0	0.0	89.1	0.0	0.0	62.2	0.0	164.9	138.2	0.0	67.9
LnGrp LOS	F	A	A	F	A	A	E	A	F	F	A	E
Approach Vol, veh/h		297			272			646			869	
Approach Delay, s/veh		84.0			89.1			156.5			88.7	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.3	57.6		32.9	24.7	46.2		30.2				
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2				
Max Green Setting (Gmax), s	* 16	40.0		28.0	* 20	40.0		24.0				
Max Q Clear Time (g_c+I1), s	6.3	50.6		26.4	22.0	42.0		24.0				
Green Ext Time (p_c), s	0.0	0.0		0.3	0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			109.1									
HCM 6th LOS			F									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	52	69	73	35	47	43	390	67	48	477	137
Future Volume (veh/h)	151	52	69	73	35	47	43	390	67	48	477	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	178	61	20	86	41	0	51	459	0	56	561	143
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	160	52	203	213	0	130	752	637	136	582	148
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.00	0.08	0.45	0.00	0.09	0.45	0.45
Sat Flow, veh/h	1594	1198	393	1594	1673	0	1594	1673	1418	1594	1286	328
Grp Volume(v), veh/h	178	0	81	86	41	0	51	459	0	56	0	704
Grp Sat Flow(s),veh/h/ln	1594	0	1591	1594	1673	0	1594	1673	1418	1594	0	1613
Q Serve(g_s), s	9.5	0.0	4.1	4.3	1.9	0.0	2.7	18.2	0.0	2.9	0.0	37.0
Cycle Q Clear(g_c), s	9.5	0.0	4.1	4.3	1.9	0.0	2.7	18.2	0.0	2.9	0.0	37.0
Prop In Lane	1.00		0.25	1.00		0.00	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	213	0	213	203	213	0	130	752	637	136	0	731
V/C Ratio(X)	0.84	0.00	0.38	0.42	0.19	0.00	0.39	0.61	0.00	0.41	0.00	0.96
Avail Cap(c_a), veh/h	274	0	273	347	364	0	274	767	650	274	0	739
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.9	0.0	34.5	35.2	34.1	0.0	38.1	18.3	0.0	37.9	0.0	23.2
Incr Delay (d2), s/veh	13.1	0.0	0.4	0.5	0.2	0.0	0.7	1.7	0.0	0.7	0.0	24.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	1.5	1.7	0.8	0.0	1.0	6.5	0.0	1.1	0.0	17.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.0	0.0	35.0	35.7	34.3	0.0	38.8	19.9	0.0	38.6	0.0	47.6
LnGrp LOS	D	A	C	D	C	A	D	B	A	D	A	D
Approach Vol, veh/h		259			127			510			760	
Approach Delay, s/veh		45.3			35.2			21.8			46.9	
Approach LOS		D			D			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.8	45.4		14.8	11.1	45.0		16.4				
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7				
Max Green Setting (Gmax), s	15.0	40.0		19.0	15.0	40.0		15.0				
Max Q Clear Time (g_c+I1), s	4.7	39.0		6.3	4.9	20.2		11.5				
Green Ext Time (p_c), s	0.0	0.6		0.2	0.0	3.6		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			38.0									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	12	35	70	7	43	34	418	40	24	533	43
Future Volume (veh/h)	32	12	35	70	7	43	34	418	40	24	533	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	36	14	0	80	8	12	39	475	0	27	606	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	282	91	253	304	32	31	102	726	615	77	700	593
Arrive On Green	0.18	0.18	0.00	0.18	0.18	0.18	0.06	0.43	0.00	0.05	0.42	0.00
Sat Flow, veh/h	1000	511	1418	1092	177	173	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	50	0	0	100	0	0	39	475	0	27	606	0
Grp Sat Flow(s),veh/h/ln	1511	0	1418	1443	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	0.0	0.0	0.0	2.0	0.0	0.0	1.4	13.4	0.0	1.0	19.6	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.0	3.5	0.0	0.0	1.4	13.4	0.0	1.0	19.6	0.0
Prop In Lane	0.72		1.00	0.80		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	373	0	253	366	0	0	102	726	615	77	700	593
V/C Ratio(X)	0.13	0.00	0.00	0.27	0.00	0.00	0.38	0.65	0.00	0.35	0.87	0.00
Avail Cap(c_a), veh/h	750	0	620	732	0	0	295	844	715	295	844	715
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.7	0.0	0.0	21.5	0.0	0.0	26.7	13.3	0.0	27.4	15.8	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	0.0	0.9	1.8	0.0	1.0	8.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	1.2	0.0	0.0	0.5	4.5	0.0	0.4	7.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	0.0	0.0	21.6	0.0	0.0	27.6	15.1	0.0	28.4	24.6	0.0
LnGrp LOS	C	A	A	C	A	A	C	B	A	C	C	A
Approach Vol, veh/h		50			100			514			633	
Approach Delay, s/veh		20.8			21.6			16.1			24.8	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	33.7		18.3	6.6	34.6		18.3
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7
Max Green Setting (Gmax), s	11.0	30.0		* 26	11.0	30.0		* 26
Max Q Clear Time (g_c+I1), s	3.4	21.6		5.5	3.0	15.4		3.5
Green Ext Time (p_c), s	0.0	3.2		0.3	0.0	3.5		0.1

Intersection Summary	
HCM 6th Ctrl Delay	20.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln

08/22/2023

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	83	208	139	430	538	112
Future Vol, veh/h	83	208	139	430	538	112
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	250	150	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	95	239	160	494	618	129

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1440	626	622	0	-	0
Stage 1	622	-	-	-	-	-
Stage 2	818	-	-	-	-	-
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	146	484	959	-	-	0
Stage 1	535	-	-	-	-	0
Stage 2	434	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	121	481	956	-	-	-
Mov Cap-2 Maneuver	256	-	-	-	-	-
Stage 1	445	-	-	-	-	-
Stage 2	433	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.8	2.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	956	-	256	481	-
HCM Lane V/C Ratio	0.167	-	0.373	0.497	-
HCM Control Delay (s)	9.5	-	27.2	19.7	-
HCM Lane LOS	A	-	D	C	-
HCM 95th %tile Q(veh)	0.6	-	1.6	2.7	-

HCM 6th TWSC
5: Murphy Ave & Healdsburg Ave
08/22/2023

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	699	52	18	546	37	60
Future Vol, veh/h	699	52	18	546	37	60
Conflicting Peds, #/hr	0	19	13	0	19	13
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	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	794	59	20	620	42	68

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	872	0	1522	856
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	679	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	773	-	130	357
Stage 1	-	-	-	-	422	-
Stage 2	-	-	-	-	504	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	761	-	123	348
Mov Cap-2 Maneuver	-	-	-	-	259	-
Stage 1	-	-	-	-	415	-
Stage 2	-	-	-	-	483	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	23.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	308	-	-	761	-
HCM Lane V/C Ratio	0.358	-	-	0.027	-
HCM Control Delay (s)	23.1	-	-	9.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.6	-	-	0.1	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St
08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	553	0	0	408	135	0	189	0	166	0	129
Future Volume (veh/h)	151	553	0	0	408	135	0	189	0	166	0	129
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	170	621	0	0	458	0	0	212	0	187	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0	2	0	2
Cap, veh/h	198	774	0	0	488	413	0	449	0	216	0	0
Arrive On Green	0.12	0.46	0.00	0.00	0.29	0.00	0.00	0.27	0.00	0.14	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1418	0	1673	0	1594	187	
Grp Volume(v), veh/h	170	621	0	0	458	0	0	212	0	187	58.4	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1418	0	1673	0	1594	E	
Q Serve(g_s), s	10.5	31.9	0.0	0.0	26.8	0.0	0.0	10.7	0.0	11.5		
Cycle Q Clear(g_c), s	10.5	31.9	0.0	0.0	26.8	0.0	0.0	10.7	0.0	11.5		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	198	774	0	0	488	413	0	449	0	216		
V/C Ratio(X)	0.86	0.80	0.00	0.00	0.94	0.00	0.00	0.47	0.00	0.87		
Avail Cap(c_a), veh/h	254	774	0	0	500	424	0	450	0	286		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	43.1	23.1	0.0	0.0	34.7	0.0	0.0	30.8	0.0	42.6		
Incr Delay (d2), s/veh	17.1	6.1	0.0	0.0	25.9	0.0	0.0	1.7	0.0	15.8		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.0	13.3	0.0	0.0	14.3	0.0	0.0	4.5	0.0	5.5		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.3	29.2	0.0	0.0	60.6	0.0	0.0	32.5	0.0	58.4		
LnGrp LOS	E	C	A	A	E	A	A	C	A	E		
Approach Vol, veh/h		791			458			212				
Approach Delay, s/veh		35.9			60.6			32.5				
Approach LOS		D			E			C				

Timer - Assigned Phs		2			5	6	7	8				
Phs Duration (G+Y+Rc), s		52.2			17.2	35.1	18.3	29.9				
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0				
Max Green Setting (Gmax), s		30.0			* 16	30.0	* 18	27.0				
Max Q Clear Time (g_c+I1), s		33.9			12.5	28.8	13.5	12.7				
Green Ext Time (p_c), s		0.0			0.1	0.5	0.1	1.8				

Intersection Summary	
HCM 6th Ctrl Delay	44.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Summary Sheet Combining HCM 6th Edition Vehicle Delays at SR 116(Healdsburg Ave-N Main St)/N Main St

AM Existing	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay
Adjusted Flow Rate (AFR)	170	621	458	0	212	187	0	1648	1436
HCM Lane Group Delay	60.3	29.2	60.6	0	32.5	58.4	0		
AFR * Lane Group Delay	10251	18133	27755	0	6890	10921	0	73950	67060
HCM Intersection Delay (s)								44.9	**46.7 LOS D**
PM Existing	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay
Adjusted Flow Rate (AFR)	125	580	571	11	112	171	0	1570	1458
HCM Lane Group Delay	46.3	25.2	94	22.3	27.7	49.6	0		
AFR * Lane Group Delay	5788	14616	53674	245	3102	8482	0	85907	82804
HCM Intersection Delay (s)								54.7	**56.8 LOS E**
AM Future	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay
Adjusted Flow Rate (AFR)	205	761	537	81	189	226	0	1999	1810
HCM Lane Group Delay	83.8	32.9	56	29	48.5	82.5	0		
AFR * Lane Group Delay	17179	25037	30072	2349	9167	18645	0	102448	93282
HCM Intersection Delay (s)								51.2	**51.5 LOS D**
PM Future	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay
Adjusted Flow Rate (AFR)	94	847	898	14	109	183	0	2145	2036
HCM Lane Group Delay	143.3	27.8	73.4	17.3	55.6	130.4	0		
AFR * Lane Group Delay	13470	23547	65913	242	6060	23863	0	133096	127035
HCM Intersection Delay (s)								62.0	**62.4 LOS E**
AM Existing plus Project	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay
Adjusted Flow Rate (AFR)	173	636	464	0	212	187	1	1673	1461
HCM Lane Group Delay	61.7	30.1	62.5	0	32.9	59.1	0		
AFR * Lane Group Delay	10674	19144	29000	0	6975	11052	0	76844	69869
HCM Intersection Delay (s)								45.9	**47.8 LOS D**
PM Existing plus Project	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay
Adjusted Flow Rate (AFR)	127	591	585	11	112	171	4	1601	1489
HCM Lane Group Delay	46.5	25.8	103.9	22.4	27.7	49.7	49.7		
AFR * Lane Group Delay	5906	15248	60782	246	3102	8499	199	93981	90879
HCM Intersection Delay (s)								58.7	**61.0 LOS E**
PM E+P with Retiming	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay
Adjusted Flow Rate (AFR)	127	591	585	11	112	171	0	1597	1485
HCM Lane Group Delay	83.5	23.2	69.5	21.1	29.6	91.7	0		
AFR * Lane Group Delay	10605	13711	40658	232	3315	15681	0	84201	80886
HCM Intersection Delay (s)								52.7	**54.5 LOS D**
AM Future plus Project	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay
Adjusted Flow Rate (AFR)	208	774	542	81	189	226	0	2020	1831
HCM Lane Group Delay	85.4	33.9	57.1	29.1	49.3	83.6	0		
AFR * Lane Group Delay	17763	26239	30948	2357	9318	18894	0	105518	96201
HCM Intersection Delay (s)								52.2	**52.5 LOS D**
PM Future plus Project	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay
Adjusted Flow Rate (AFR)	96	857	911	14	109	183	0	2170	2061
HCM Lane Group Delay	150	28.5	77.7	17.3	55.6	130.4	0		
AFR * Lane Group Delay	14400	24425	70785	242	6060	23863	0	139775	133715
HCM Intersection Delay (s)								64.4	**64.9 LOS E**

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd
08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	158	56	111	123	260	46	424	94	221	488	41
Future Volume (veh/h)	50	158	56	111	123	260	46	424	94	221	488	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	184	55	129	143	0	53	493	100	257	567	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	210	63	153	318	507	116	498	101	267	710	56
Arrive On Green	0.08	0.17	0.17	0.10	0.19	0.00	0.07	0.37	0.37	0.17	0.46	0.46
Sat Flow, veh/h	1594	1237	370	1594	1673	1418	1594	1350	274	1594	1530	121
Grp Volume(v), veh/h	58	0	239	129	143	0	53	0	593	257	0	612
Grp Sat Flow(s),veh/h/ln	1594	0	1607	1594	1673	1418	1594	0	1623	1594	0	1652
Q Serve(g_s), s	3.9	0.0	16.0	8.8	8.3	0.0	3.5	0.0	40.0	17.6	0.0	34.8
Cycle Q Clear(g_c), s	3.9	0.0	16.0	8.8	8.3	0.0	3.5	0.0	40.0	17.6	0.0	34.8
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.17	1.00		0.07
Lane Grp Cap(c), veh/h	120	0	272	153	318	507	116	0	599	267	0	766
V/C Ratio(X)	0.48	0.00	0.88	0.84	0.45	0.00	0.46	0.00	0.99	0.96	0.00	0.80
Avail Cap(c_a), veh/h	145	0	340	155	364	547	145	0	599	267	0	766
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.9	0.0	44.7	49.0	39.5	0.0	49.0	0.0	34.6	45.5	0.0	25.2
Incr Delay (d2), s/veh	1.1	0.0	20.4	30.8	1.4	0.0	1.0	0.0	34.1	44.0	0.0	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	7.6	4.7	3.5	0.0	1.4	0.0	20.4	10.0	0.0	13.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.0	0.0	65.0	79.8	41.0	0.0	50.1	0.0	68.6	89.5	0.0	31.4
LnGrp LOS	D	A	E	E	D	A	D	A	E	F	A	C
Approach Vol, veh/h		297			272			646			869	
Approach Delay, s/veh		62.1			59.4			67.1			48.6	
Approach LOS		E			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	57.4	15.3	24.9	23.2	46.9	13.0	27.2
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 10	49.2	* 11	23.3	* 19	40.7	* 10	24.0
Max Q Clear Time (g_c+I1), s	5.5	36.8	10.8	18.0	19.6	42.0	5.9	10.3
Green Ext Time (p_c), s	0.0	4.1	0.0	0.7	0.0	0.0	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	57.7
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd
08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	158	56	111	123	260	46	424	94	221	488	41
Future Volume (veh/h)	50	158	56	111	123	260	46	424	94	221	488	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	184	55	129	143	0	53	493	100	257	567	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	224	190	154	256	468	120	516	105	283	741	59
Arrive On Green	0.08	0.13	0.13	0.10	0.15	0.00	0.08	0.38	0.38	0.18	0.48	0.48
Sat Flow, veh/h	1594	1673	1418	1594	1673	1418	1594	1350	274	1594	1530	121
Grp Volume(v), veh/h	58	184	55	129	143	0	53	0	593	257	0	612
Grp Sat Flow(s),veh/h/ln	1594	1673	1418	1594	1673	1418	1594	0	1623	1594	0	1652
Q Serve(g_s), s	3.6	11.1	3.6	8.3	8.2	0.0	3.3	0.0	37.0	16.5	0.0	31.6
Cycle Q Clear(g_c), s	3.6	11.1	3.6	8.3	8.2	0.0	3.3	0.0	37.0	16.5	0.0	31.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		0.07
Lane Grp Cap(c), veh/h	125	224	190	154	256	468	120	0	621	283	0	800
V/C Ratio(X)	0.47	0.82	0.29	0.84	0.56	0.00	0.44	0.00	0.96	0.91	0.00	0.77
Avail Cap(c_a), veh/h	153	334	283	202	386	579	153	0	635	283	0	800
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.9	43.8	40.6	46.2	40.8	0.0	46.0	0.0	31.3	42.0	0.0	22.0
Incr Delay (d2), s/veh	1.0	12.0	1.2	16.3	2.7	0.0	0.9	0.0	25.1	30.4	0.0	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.1	1.3	3.9	3.5	0.0	1.3	0.0	17.7	8.6	0.0	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.9	55.8	41.8	62.5	43.6	0.0	47.0	0.0	56.4	72.4	0.0	26.7
LnGrp LOS	D	E	D	E	D	A	D	A	E	E	A	C
Approach Vol, veh/h		297			272			646			869	
Approach Delay, s/veh		51.5			52.5			55.6			40.2	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	56.6	14.8	20.2	23.2	46.0	12.8	22.1
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 10	49.2	* 13	20.8	* 19	40.7	* 10	24.0
Max Q Clear Time (g_c+I1), s	5.3	33.6	10.3	13.1	18.5	39.0	5.6	10.2
Green Ext Time (p_c), s	0.0	4.6	0.0	0.8	0.0	0.8	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	48.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Intersection				
Intersection Delay, s/veh	26.8			
Intersection LOS	D			

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	307	574	655	872
Demand Flow Rate, veh/h	313	586	668	889
Vehicles Circulating, veh/h	972	616	509	332
Vehicles Exiting, veh/h	249	561	776	870
Ped Vol Crossing Leg, #/h	0	2	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	20.8	25.5	24.9	31.2
Approach LOS	C	D	C	D

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	313	586	668	889
Cap Entry Lane, veh/h	512	736	821	984
Entry HV Adj Factor	0.982	0.980	0.981	0.981
Flow Entry, veh/h	307	574	655	872
Cap Entry, veh/h	503	721	805	964
V/C Ratio	0.611	0.796	0.814	0.904
Control Delay, s/veh	20.8	25.5	24.9	31.2
LOS	C	D	C	D
95th %tile Queue, veh	4	8	9	13

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	167	97	87	162	198	108	511	80	240	513	46
Future Volume (veh/h)	87	167	97	87	162	198	108	511	80	240	513	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	92	176	88	92	171	0	114	538	78	253	540	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	84	162	81	100	185	246	135	423	61	237	551	45
Arrive On Green	0.21	0.21	0.21	0.17	0.17	0.00	0.08	0.30	0.30	0.15	0.36	0.36
Sat Flow, veh/h	406	777	388	575	1069	1418	1594	1424	206	1594	1527	124
Grp Volume(v), veh/h	356	0	0	263	0	0	114	0	616	253	0	584
Grp Sat Flow(s),veh/h/ln	1571	0	0	1645	0	1418	1594	0	1630	1594	0	1651
Q Serve(g_s), s	28.0	0.0	0.0	21.2	0.0	0.0	9.5	0.0	40.0	20.0	0.0	47.1
Cycle Q Clear(g_c), s	28.0	0.0	0.0	21.2	0.0	0.0	9.5	0.0	40.0	20.0	0.0	47.1
Prop In Lane	0.26		0.25	0.35		1.00	1.00		0.13	1.00		0.08
Lane Grp Cap(c), veh/h	327	0	0	285	0	246	135	0	484	237	0	596
V/C Ratio(X)	1.09	0.00	0.00	0.92	0.00	0.00	0.85	0.00	1.27	1.07	0.00	0.98
Avail Cap(c_a), veh/h	327	0	0	293	0	253	189	0	484	237	0	596
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.3	0.0	0.0	54.8	0.0	0.0	60.8	0.0	47.3	57.3	0.0	42.5
Incr Delay (d2), s/veh	75.9	0.0	0.0	33.0	0.0	0.0	16.0	0.0	137.8	77.9	0.0	31.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.5	0.0	0.0	11.3	0.0	0.0	4.4	0.0	34.2	13.0	0.0	23.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	129.2	0.0	0.0	87.8	0.0	0.0	76.8	0.0	185.1	135.2	0.0	74.2
LnGrp LOS	F	A	A	F	A	A	E	A	F	F	A	E
Approach Vol, veh/h		356			263			730			837	
Approach Delay, s/veh		129.2			87.8			168.2			92.6	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.1	54.8		34.2	24.7	46.2		29.5
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2
Max Green Setting (Gmax), s	* 16	40.0		28.0	* 20	40.0		24.0
Max Q Clear Time (g_c+I1), s	11.5	49.1		30.0	22.0	42.0		23.2
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.1

Intersection Summary	
HCM 6th Ctrl Delay	123.2
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	11	86	18	4	11	58	481	6	4	604	132
Future Volume (veh/h)	165	11	86	18	4	11	58	481	6	4	604	132
Initial Q (Qb), veh	0	0	0	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	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	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			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	168	11	0	18	4	0	59	491	0	4	616	123
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	220	231	0	85	89	0	147	951	806	17	656	131
Arrive On Green	0.14	0.14	0.00	0.05	0.05	0.00	0.09	0.57	0.00	0.01	0.49	0.49
Sat Flow, veh/h	1594	1673	0	1594	1673	0	1594	1673	1418	1594	1349	269
Grp Volume(v), veh/h	168	11	0	18	4	0	59	491	0	4	0	739
Grp Sat Flow(s),veh/h/ln	1594	1673	0	1594	1673	0	1594	1673	1418	1594	0	1618
Q Serve(g_s), s	7.9	0.4	0.0	0.8	0.2	0.0	2.7	14.0	0.0	0.2	0.0	33.7
Cycle Q Clear(g_c), s	7.9	0.4	0.0	0.8	0.2	0.0	2.7	14.0	0.0	0.2	0.0	33.7
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	220	231	0	85	89	0	147	951	806	17	0	788
V/C Ratio(X)	0.76	0.05	0.00	0.21	0.04	0.00	0.40	0.52	0.00	0.24	0.00	0.94
Avail Cap(c_a), veh/h	306	322	0	388	407	0	306	951	806	306	0	829
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.4	29.2	0.0	35.4	35.0	0.0	33.4	10.3	0.0	38.3	0.0	18.9
Incr Delay (d2), s/veh	4.3	0.0	0.0	0.5	0.1	0.0	0.7	0.7	0.0	2.6	0.0	17.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.2	0.0	0.3	0.1	0.0	1.0	4.2	0.0	0.1	0.0	14.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.7	29.2	0.0	35.8	35.1	0.0	34.0	10.9	0.0	40.9	0.0	36.9
LnGrp LOS	D	C	A	D	D	A	C	B	A	D	A	D
Approach Vol, veh/h		179			22			550			743	
Approach Delay, s/veh		36.2			35.7			13.4			36.9	
Approach LOS		D			D			B			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.9	43.8		7.9	4.5	50.2		15.5				
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7				
Max Green Setting (Gmax), s	15.0	40.0		19.0	15.0	40.0		15.0				
Max Q Clear Time (g_c+I1), s	4.7	35.7		2.8	2.2	16.0		9.9				
Green Ext Time (p_c), s	0.0	2.3		0.0	0.0	4.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			28.2									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	6	77	45	14	25	66	487	34	19	598	65
Future Volume (veh/h)	68	6	77	45	14	25	66	487	34	19	598	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		1.00	0.98		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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	70	6	0	46	14	0	68	502	0	20	616	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	350	25	268	300	77	0	139	773	655	59	690	584
Arrive On Green	0.19	0.19	0.00	0.19	0.19	0.00	0.09	0.46	0.00	0.04	0.41	0.00
Sat Flow, veh/h	1290	134	1418	1070	409	0	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	76	0	0	60	0	0	68	502	0	20	616	0
Grp Sat Flow(s),veh/h/ln	1424	0	1418	1479	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	0.7	0.0	0.0	0.0	0.0	0.0	2.6	14.9	0.0	0.8	22.2	0.0
Cycle Q Clear(g_c), s	2.7	0.0	0.0	2.0	0.0	0.0	2.6	14.9	0.0	0.8	22.2	0.0
Prop In Lane	0.92		1.00	0.77		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	376	0	268	377	0	0	139	773	655	59	690	584
V/C Ratio(X)	0.20	0.00	0.00	0.16	0.00	0.00	0.49	0.65	0.00	0.34	0.89	0.00
Avail Cap(c_a), veh/h	672	0	569	684	0	0	271	775	657	271	775	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.4	0.0	0.0	22.1	0.0	0.0	28.2	13.4	0.0	30.4	17.7	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	0.0	1.0	2.2	0.0	1.2	12.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.7	0.0	0.0	1.0	5.2	0.0	0.3	9.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.5	0.0	0.0	22.2	0.0	0.0	29.2	15.6	0.0	31.6	30.1	0.0
LnGrp LOS	C	A	A	C	A	A	C	B	A	C	C	A
Approach Vol, veh/h		76			60			570			636	
Approach Delay, s/veh		22.5			22.2			17.2			30.2	
Approach LOS		C			C			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	35.5		19.9	6.1	38.7		19.9				
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7				
Max Green Setting (Gmax), s	11.0	30.0		* 26	11.0	30.0		* 26				
Max Q Clear Time (g_c+I1), s	4.6	24.2		4.0	2.8	16.9		4.7				
Green Ext Time (p_c), s	0.0	2.5		0.1	0.0	3.5		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			23.9									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln 08/22/2023

Intersection						
Int Delay, s/veh	4.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	78	199	203	555	595	131
Future Vol, veh/h	78	199	203	555	595	131
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	250	150	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	81	207	211	578	620	136

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1628	628	624	0	-	0
Stage 1	624	-	-	-	-	-
Stage 2	1004	-	-	-	-	-
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	112	483	957	-	-	0
Stage 1	534	-	-	-	-	0
Stage 2	354	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	87	480	954	-	-	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	415	-	-	-	-	-
Stage 2	353	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	22		2.6		0	
HCM LOS	C					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	954	-	213	480	-
HCM Lane V/C Ratio	0.222	-	0.381	0.432	-
HCM Control Delay (s)	9.8	-	32	18.1	-
HCM Lane LOS	A	-	D	C	-
HCM 95th %tile Q(veh)	0.8	-	1.7	2.1	-

HCM 6th TWSC
5: Murphy Ave & Healdsburg Ave 08/22/2023

Intersection						
Int Delay, s/veh	0.9					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	727	66	25	752	22	41
Future Vol, veh/h	727	66	25	752	22	41
Conflicting Peds, #/hr	0	27	19	0	27	19
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	749	68	26	775	23	42

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	844	0	1664	829
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	854	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	792	-	107	370
Stage 1	-	-	-	-	438	-
Stage 2	-	-	-	-	417	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	774	-	99	356
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	394	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		0.3		20.3	
HCM LOS					C	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	300	-	-	774	-
HCM Lane V/C Ratio	0.216	-	-	0.033	-
HCM Control Delay (s)	20.3	-	-	9.8	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	563	0	0	554	116	0	109	0	166	0	144
Future Volume (veh/h)	121	563	0	0	554	116	0	109	0	166	0	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	125	580	0	0	571	11	0	112	0	171	0	0
Peak Hour Factor	0.97	0.97	0.97	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	0	2	0	2	0	2
Cap, veh/h	152	772	0	0	530	439	0	452	0	201	0	0
Arrive On Green	0.10	0.46	0.00	0.00	0.32	0.32	0.00	0.27	0.00	0.13	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1387	0	1673	0	1594	171	
Grp Volume(v), veh/h	125	580	0	0	571	11	0	112	0	171	49.6	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1387	0	1673	0	1594	D	
Q Serve(g_s), s	7.3	27.1	0.0	0.0	30.0	0.5	0.0	5.0	0.0	10.0		
Cycle Q Clear(g_c), s	7.3	27.1	0.0	0.0	30.0	0.5	0.0	5.0	0.0	10.0		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	152	772	0	0	530	439	0	452	0	201		
V/C Ratio(X)	0.82	0.75	0.00	0.00	1.08	0.03	0.00	0.25	0.00	0.85		
Avail Cap(c_a), veh/h	269	772	0	0	530	439	0	477	0	303		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	42.1	21.0	0.0	0.0	32.4	22.3	0.0	27.1	0.0	40.5		
Incr Delay (d2), s/veh	4.2	4.1	0.0	0.0	61.7	0.0	0.0	0.6	0.0	9.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.0	10.9	0.0	0.0	21.0	0.2	0.0	2.0	0.0	4.4		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	25.2	0.0	0.0	94.0	22.3	0.0	27.7	0.0	49.6		
LnGrp LOS	D	C	A	A	F	C	A	C	A	D		
Approach Vol, veh/h		705			582			112				
Approach Delay, s/veh		28.9			92.7			27.7				
Approach LOS		C			F			C				
Timer - Assigned Phs		2			5	6	7	8				
Phs Duration (G+Y+Rc), s		49.5			13.7	35.8	16.6	28.6				
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0				
Max Green Setting (Gmax), s		30.0			* 16	30.0	* 18	27.0				
Max Q Clear Time (g_c+I1), s		29.1			9.3	32.0	12.0	7.0				
Green Ext Time (p_c), s		0.4			0.1	0.0	0.1	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			54.7									
HCM 6th LOS			D									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	167	97	87	162	198	108	511	80	240	513	46
Future Volume (veh/h)	87	167	97	87	162	198	108	511	80	240	513	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	92	176	88	92	171	0	114	538	78	253	540	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	192	96	125	309	501	136	556	81	270	724	59
Arrive On Green	0.08	0.18	0.18	0.08	0.18	0.00	0.09	0.39	0.39	0.17	0.47	0.47
Sat Flow, veh/h	1594	1042	521	1594	1673	1418	1594	1424	206	1594	1527	124
Grp Volume(v), veh/h	92	0	264	92	171	0	114	0	616	253	0	584
Grp Sat Flow(s),veh/h/ln	1594	0	1563	1594	1673	1418	1594	0	1630	1594	0	1651
Q Serve(g_s), s	6.9	0.0	20.3	6.9	11.4	0.0	8.6	0.0	45.3	19.2	0.0	35.2
Cycle Q Clear(g_c), s	6.9	0.0	20.3	6.9	11.4	0.0	8.6	0.0	45.3	19.2	0.0	35.2
Prop In Lane	1.00		0.33	1.00		1.00	1.00		0.13	1.00		0.08
Lane Grp Cap(c), veh/h	125	0	288	125	309	501	136	0	636	270	0	783
V/C Ratio(X)	0.74	0.00	0.92	0.74	0.55	0.00	0.84	0.00	0.97	0.94	0.00	0.75
Avail Cap(c_a), veh/h	134	0	307	134	328	518	171	0	642	270	0	783
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	55.2	0.0	49.0	55.2	45.3	0.0	55.2	0.0	36.6	50.2	0.0	26.2
Incr Delay (d2), s/veh	15.3	0.0	30.4	15.3	2.4	0.0	20.9	0.0	27.7	38.1	0.0	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	10.0	3.3	4.9	0.0	4.2	0.0	21.9	10.3	0.0	13.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.5	0.0	79.3	70.5	47.7	0.0	76.1	0.0	64.3	88.3	0.0	30.4
LnGrp LOS	E	A	E	E	D	A	E	A	E	F	A	C
Approach Vol, veh/h		356			263			730			837	
Approach Delay, s/veh		77.0			55.7			66.1			47.9	
Approach LOS		E			E			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.1	64.2	14.3	28.8	25.4	54.0	14.3	28.8				
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2				
Max Green Setting (Gmax), s	* 13	55.8	* 10	24.0	* 21	48.2	* 10	24.0				
Max Q Clear Time (g_c+I1), s	10.6	37.2	8.9	22.3	21.2	47.3	8.9	13.4				
Green Ext Time (p_c), s	0.0	4.8	0.0	0.3	0.0	0.4	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			59.7									
HCM 6th LOS			E									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	167	97	87	162	198	108	511	80	240	513	46
Future Volume (veh/h)	87	167	97	87	162	198	108	511	80	240	513	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	92	176	88	92	171	0	114	538	78	253	540	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	138	219	181	138	219	434	143	578	84	279	750	61
Arrive On Green	0.09	0.13	0.13	0.09	0.13	0.00	0.09	0.41	0.41	0.17	0.49	0.49
Sat Flow, veh/h	1594	1673	1378	1594	1673	1418	1594	1424	206	1594	1527	124
Grp Volume(v), veh/h	92	176	88	92	171	0	114	0	616	253	0	584
Grp Sat Flow(s),veh/h/ln	1594	1673	1378	1594	1673	1418	1594	0	1630	1594	0	1651
Q Serve(g_s), s	6.0	11.0	6.4	6.0	10.7	0.0	7.6	0.0	39.0	16.8	0.0	30.1
Cycle Q Clear(g_c), s	6.0	11.0	6.4	6.0	10.7	0.0	7.6	0.0	39.0	16.8	0.0	30.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.08
Lane Grp Cap(c), veh/h	138	219	181	138	219	434	143	0	662	279	0	811
V/C Ratio(X)	0.67	0.80	0.49	0.67	0.78	0.00	0.80	0.00	0.93	0.91	0.00	0.72
Avail Cap(c_a), veh/h	152	362	298	161	372	563	193	0	727	305	0	852
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.8	45.6	43.6	47.8	45.4	0.0	48.2	0.0	30.7	43.7	0.0	21.7
Incr Delay (d2), s/veh	6.8	9.3	2.9	5.3	8.3	0.0	11.0	0.0	18.2	26.6	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	5.0	2.3	2.6	4.8	0.0	3.3	0.0	17.5	8.4	0.0	11.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	54.9	46.5	53.2	53.7	0.0	59.2	0.0	48.9	70.3	0.0	24.8
LnGrp LOS	D	D	D	D	D	A	E	A	D	E	A	C
Approach Vol, veh/h		356			263			730			837	
Approach Delay, s/veh		52.8			53.5			50.5			38.6	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.4	59.3	14.1	20.4	23.6	50.0	14.1	20.4
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 13	55.8	* 11	23.4	* 21	48.2	* 10	24.0
Max Q Clear Time (g_c+I1), s	9.6	32.1	8.0	13.0	18.8	41.0	8.0	12.7
Green Ext Time (p_c), s	0.0	5.2	0.0	1.1	0.1	2.9	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	46.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Intersection	
Intersection Delay, s/veh	33.1
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	370	471	736	841
Demand Flow Rate, veh/h	378	480	751	858
Vehicles Circulating, veh/h	903	759	532	384
Vehicles Exiting, veh/h	339	524	749	855
Ped Vol Crossing Leg, #/h	1	2	0	1
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	23.6	25.1	41.1	34.7
Approach LOS	C	D	E	D

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	378	480	751	858
Cap Entry Lane, veh/h	549	636	802	933
Entry HV Adj Factor	0.980	0.980	0.980	0.980
Flow Entry, veh/h	370	471	736	841
Cap Entry, veh/h	538	624	786	914
V/C Ratio	0.688	0.755	0.936	0.920
Control Delay, s/veh	23.6	25.1	41.1	34.7
LOS	C	D	E	D
95th %tile Queue, veh	5	7	14	14

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	233	73	221	138	303	52	499	212	321	630	41
Future Volume (veh/h)	50	233	73	221	138	303	52	499	212	321	630	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	271	75	257	160	50	60	580	238	373	733	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	35	164	45	199	124	282	98	389	160	237	675	41
Arrive On Green	0.15	0.15	0.15	0.20	0.20	0.20	0.06	0.35	0.35	0.15	0.43	0.43
Sat Flow, veh/h	231	1079	299	1001	623	1418	1594	1126	462	1594	1560	96
Grp Volume(v), veh/h	404	0	0	417	0	50	60	0	818	373	0	778
Grp Sat Flow(s),veh/h/ln	1608	0	0	1623	0	1418	1594	0	1589	1594	0	1656
Q Serve(g_s), s	22.8	0.0	0.0	29.8	0.0	4.4	5.5	0.0	51.8	22.3	0.0	64.9
Cycle Q Clear(g_c), s	22.8	0.0	0.0	29.8	0.0	4.4	5.5	0.0	51.8	22.3	0.0	64.9
Prop In Lane	0.14		0.19	0.62		1.00	1.00		0.29	1.00		0.06
Lane Grp Cap(c), veh/h	244	0	0	323	0	282	98	0	549	237	0	717
V/C Ratio(X)	1.65	0.00	0.00	1.29	0.00	0.18	0.62	0.00	1.49	1.57	0.00	1.09
Avail Cap(c_a), veh/h	244	0	0	323	0	282	106	0	549	237	0	717
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.6	0.0	0.0	60.1	0.0	49.9	68.7	0.0	49.1	63.8	0.0	42.5
Incr Delay (d2), s/veh	311.3	0.0	0.0	153.0	0.0	0.4	5.7	0.0	230.5	277.8	0.0	59.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.2	0.0	0.0	25.8	0.0	1.6	2.4	0.0	55.0	27.2	0.0	37.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	374.9	0.0	0.0	213.1	0.0	50.3	74.4	0.0	279.6	341.6	0.0	101.7
LnGrp LOS	F	A	A	F	A	D	E	A	F	F	A	F
Approach Vol, veh/h		404			467			878			1151	
Approach Delay, s/veh		374.9			195.7			265.6			179.4	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.9	71.1		29.0	27.0	58.0		36.0				
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2				
Max Green Setting (Gmax), s	* 10	64.1		22.8	* 22	51.8		29.8				
Max Q Clear Time (g_c+I1), s	7.5	66.9		24.8	24.3	53.8		31.8				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			235.4									
HCM 6th LOS			F									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	52	97	73	35	47	36	441	67	48	591	135
Future Volume (veh/h)	180	52	97	73	35	47	36	441	67	48	591	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	180	52	45	73	35	0	36	441	0	48	591	120
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	217	111	96	202	212	0	107	748	634	127	620	126
Arrive On Green	0.14	0.14	0.14	0.13	0.13	0.00	0.07	0.45	0.00	0.08	0.46	0.46
Sat Flow, veh/h	1594	817	707	1594	1673	0	1594	1673	1418	1594	1349	274
Grp Volume(v), veh/h	180	0	97	73	35	0	36	441	0	48	0	711
Grp Sat Flow(s),veh/h/ln	1594	0	1524	1594	1673	0	1594	1673	1418	1594	0	1623
Q Serve(g_s), s	9.3	0.0	5.0	3.6	1.6	0.0	1.8	16.8	0.0	2.4	0.0	35.8
Cycle Q Clear(g_c), s	9.3	0.0	5.0	3.6	1.6	0.0	1.8	16.8	0.0	2.4	0.0	35.8
Prop In Lane	1.00		0.46	1.00		0.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	217	0	207	202	212	0	107	748	634	127	0	745
V/C Ratio(X)	0.83	0.00	0.47	0.36	0.17	0.00	0.34	0.59	0.00	0.38	0.00	0.95
Avail Cap(c_a), veh/h	282	0	269	357	374	0	282	788	668	282	0	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.7	0.0	33.9	33.9	33.1	0.0	37.8	17.6	0.0	37.1	0.0	22.1
Incr Delay (d2), s/veh	11.9	0.0	0.6	0.4	0.1	0.0	0.7	1.3	0.0	0.7	0.0	21.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	1.8	1.4	0.6	0.0	0.7	6.0	0.0	0.9	0.0	16.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.7	0.0	34.5	34.3	33.2	0.0	38.5	19.0	0.0	37.8	0.0	44.0
LnGrp LOS	D	A	C	C	C	A	D	B	A	D	A	D
Approach Vol, veh/h		277			108			477			759	
Approach Delay, s/veh		43.0			34.0			20.4			43.6	
Approach LOS		D			C			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	44.8		14.5	10.5	43.7		16.2				
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7				
Max Green Setting (Gmax), s	15.0	40.0		19.0	15.0	40.0		15.0				
Max Q Clear Time (g_c+I1), s	13.8	37.8		5.6	4.4	18.8		11.3				
Green Ext Time (p_c), s	0.0	1.2		0.1	0.0	3.5		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			36.0									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	12	37	70	10	43	40	562	35	24	667	43
Future Volume (veh/h)	32	12	37	70	10	43	40	562	35	24	667	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	32	12	2	70	10	10	40	562	-5	24	667	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	85	239	265	36	25	102	773	655	70	739	626
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.06	0.46	0.00	0.04	0.44	0.00
Sat Flow, veh/h	1020	502	1410	956	216	146	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	44	0	2	90	0	0	40	562	-5	24	667	0
Grp Sat Flow(s),veh/h/ln	1522	0	1410	1318	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	0.0	0.0	0.1	2.9	0.0	0.0	1.5	16.9	0.0	0.9	23.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	0.1	4.3	0.0	0.0	1.5	16.9	0.0	0.9	23.0	0.0
Prop In Lane	0.73		1.00	0.78		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	358	0	239	326	0	0	102	773	655	70	739	626
V/C Ratio(X)	0.12	0.00	0.01	0.28	0.00	0.00	0.39	0.73	-0.01	0.34	0.90	0.00
Avail Cap(c_a), veh/h	721	0	591	681	0	0	282	809	685	282	809	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.0	0.0	21.5	23.4	0.0	0.0	27.9	13.5	0.0	28.8	16.1	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.2	0.0	0.0	0.9	3.5	0.0	1.1	13.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.1	0.0	0.0	0.6	6.0	0.0	0.3	9.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.1	0.0	21.5	23.6	0.0	0.0	28.8	17.0	0.0	29.9	29.3	0.0
LnGrp LOS	C	A	C	C	A	A	C	B	A	C	C	A
Approach Vol, veh/h		46			90			597			691	
Approach Delay, s/veh		22.0			23.6			18.0			29.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	36.2		18.2	6.4	37.5		18.2
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7
Max Green Setting (Gmax), s	11.0	30.0		* 26	11.0	30.0		* 26
Max Q Clear Time (g_c+I1), s	3.5	25.0		6.3	2.9	18.9		3.4
Green Ext Time (p_c), s	0.0	2.4		0.2	0.0	3.6		0.1

Intersection Summary	
HCM 6th Ctrl Delay	24.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln

08/25/2023

Intersection	
Intersection Delay, s/veh	11.4
Intersection LOS	B

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	341	686	756
Demand Flow Rate, veh/h	348	700	771
Vehicles Circulating, veh/h	676	115	158
Vehicles Exiting, veh/h	253	909	657
Ped Vol Crossing Leg, #/h	4	4	4
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	13.1	9.7	12.2
Approach LOS	B	A	B

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	348	700	771
Cap Entry Lane, veh/h	692	1227	1174
Entry HV Adj Factor	0.980	0.981	0.980
Flow Entry, veh/h	341	686	756
Cap Entry, veh/h	678	1203	1151
V/C Ratio	0.503	0.571	0.657
Control Delay, s/veh	13.1	9.7	12.2
LOS	B	A	B
95th %tile Queue, veh	3	4	5

HCM 6th TWSC
5: Murphy Ave & Healdsburg Ave 08/25/2023

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	847	54	22	645	45	111
Future Vol, veh/h	847	54	22	645	45	111
Conflicting Peds, #/hr	0	19	13	0	19	13
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	847	54	22	645	45	111

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	920	0	1601	906
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	708	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	742	-	117	334
Stage 1	-	-	-	-	400	-
Stage 2	-	-	-	-	488	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	730	-	110	325
Mov Cap-2 Maneuver	-	-	-	-	245	-
Stage 1	-	-	-	-	394	-
Stage 2	-	-	-	-	466	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	29.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	297	-	-	730	-
HCM Lane V/C Ratio	0.525	-	-	0.03	-
HCM Control Delay (s)	29.8	-	-	10.1	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.9	-	-	0.1	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St 08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	761	0	0	537	216	0	189	0	226	0	145
Future Volume (veh/h)	205	761	0	0	537	216	0	189	0	226	0	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	205	761	0	0	537	81	0	189	0	226	0	16
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0	2	0	2
Cap, veh/h	227	888	0	0	589	487	0	350	0	248	0	0
Arrive On Green	0.14	0.53	0.00	0.00	0.35	0.35	0.00	0.21	0.00	0.16	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1385	0	1673	0	1594	226	
Grp Volume(v), veh/h	205	761	0	0	537	81	0	189	0	226	82.5	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1385	0	1673	0	1594	F	
Q Serve(g_s), s	16.3	50.5	0.0	0.0	39.5	5.2	0.0	13.0	0.0	18.0		
Cycle Q Clear(g_c), s	16.3	50.5	0.0	0.0	39.5	5.2	0.0	13.0	0.0	18.0		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	227	888	0	0	589	487	0	350	0	248		
V/C Ratio(X)	0.90	0.86	0.00	0.00	0.91	0.17	0.00	0.54	0.00	0.91		
Avail Cap(c_a), veh/h	251	1001	0	0	677	560	0	350	0	275		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	54.4	26.1	0.0	0.0	39.9	28.8	0.0	45.5	0.0	53.6		
Incr Delay (d2), s/veh	29.3	6.8	0.0	0.0	16.1	0.2	0.0	3.0	0.0	28.9		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	8.4	21.1	0.0	0.0	18.9	1.8	0.0	5.8	0.0	9.3		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.8	32.9	0.0	0.0	56.0	29.0	0.0	48.5	0.0	82.5		
LnGrp LOS	F	C	A	A	E	C	A	D	A	F		
Approach Vol, veh/h		966			618			189				
Approach Delay, s/veh		43.7			52.5			48.5				
Approach LOS		D			D			D				

Timer - Assigned Phs		2			5	6	7	8				
Phs Duration (G+Y+Rc), s		74.3			23.1	51.2	24.8	30.0				
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0				
Max Green Setting (Gmax), s		77.2			* 20	52.2	* 22	27.0				
Max Q Clear Time (g_c+I1), s		52.5			18.3	41.5	20.0	15.0				
Green Ext Time (p_c), s		6.0			0.1	3.9	0.1	1.4				

Intersection Summary	
HCM 6th Ctrl Delay	51.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	233	73	221	138	303	52	499	212	321	630	41
Future Volume (veh/h)	50	233	73	221	138	303	52	499	212	321	630	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	271	75	257	160	50	60	580	238	373	733	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	207	57	212	393	590	100	418	172	289	764	47
Arrive On Green	0.06	0.16	0.16	0.13	0.23	0.23	0.06	0.37	0.37	0.18	0.49	0.49
Sat Flow, veh/h	1594	1262	349	1594	1673	1418	1594	1127	462	1594	1560	96
Grp Volume(v), veh/h	58	0	346	257	160	50	60	0	818	373	0	778
Grp Sat Flow(s),veh/h/ln	1594	0	1611	1594	1673	1418	1594	0	1589	1594	0	1656
Q Serve(g_s), s	5.1	0.0	23.8	19.3	11.7	3.1	5.3	0.0	53.8	26.3	0.0	65.6
Cycle Q Clear(g_c), s	5.1	0.0	23.8	19.3	11.7	3.1	5.3	0.0	53.8	26.3	0.0	65.6
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.29	1.00		0.06
Lane Grp Cap(c), veh/h	99	0	264	212	393	590	100	0	589	289	0	811
V/C Ratio(X)	0.58	0.00	1.31	1.21	0.41	0.08	0.60	0.00	1.39	1.29	0.00	0.96
Avail Cap(c_a), veh/h	146	0	264	212	393	590	131	0	589	289	0	811
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.2	0.0	60.6	62.8	46.9	25.6	66.2	0.0	45.6	59.3	0.0	35.6
Incr Delay (d2), s/veh	2.0	0.0	163.5	130.6	1.0	0.1	2.1	0.0	184.7	154.1	0.0	22.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	21.4	15.4	5.0	1.1	2.2	0.0	50.6	22.7	0.0	30.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.2	0.0	224.1	193.4	47.9	25.7	68.3	0.0	230.3	213.4	0.0	57.9
LnGrp LOS	E	A	F	F	D	C	E	A	F	F	A	E
Approach Vol, veh/h		404			467			878			1151	
Approach Delay, s/veh		201.7			125.6			219.3			108.3	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.8	77.2	24.0	30.0	31.0	60.0	13.7	40.3
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 12	68.2	* 19	23.8	* 26	53.8	* 13	29.8
Max Q Clear Time (g_c+I1), s	7.3	67.6	21.3	25.8	28.3	55.8	7.1	13.7
Green Ext Time (p_c), s	0.0	0.4	0.0	0.0	0.0	0.0	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	157.7
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	233	73	221	138	303	52	499	212	321	630	41
Future Volume (veh/h)	50	233	73	221	138	303	52	499	212	321	630	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	271	75	257	160	50	60	580	238	373	733	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	229	194	212	347	551	100	449	184	289	807	50
Arrive On Green	0.06	0.14	0.14	0.13	0.21	0.21	0.06	0.40	0.40	0.18	0.52	0.52
Sat Flow, veh/h	1594	1673	1418	1594	1673	1418	1594	1127	462	1594	1560	96
Grp Volume(v), veh/h	58	271	75	257	160	50	60	0	818	373	0	778
Grp Sat Flow(s),veh/h/ln	1594	1673	1418	1594	1673	1418	1594	0	1589	1594	0	1656
Q Serve(g_s), s	5.1	19.8	7.0	19.3	12.2	3.2	5.3	0.0	57.8	26.3	0.0	62.0
Cycle Q Clear(g_c), s	5.1	19.8	7.0	19.3	12.2	3.2	5.3	0.0	57.8	26.3	0.0	62.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.29	1.00		0.06
Lane Grp Cap(c), veh/h	99	229	194	212	347	551	100	0	633	289	0	857
V/C Ratio(X)	0.58	1.19	0.39	1.21	0.46	0.09	0.60	0.00	1.29	1.29	0.00	0.91
Avail Cap(c_a), veh/h	129	229	194	212	347	551	126	0	633	289	0	857
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.2	62.6	57.1	62.8	50.4	28.1	66.2	0.0	43.6	59.3	0.0	31.9
Incr Delay (d2), s/veh	2.0	119.0	1.8	130.6	1.4	0.1	2.1	0.0	142.8	154.1	0.0	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	15.7	2.6	15.4	5.2	1.1	2.2	0.0	46.9	22.7	0.0	26.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.2	181.6	58.9	193.4	51.7	28.2	68.3	0.0	186.4	213.4	0.0	45.5
LnGrp LOS	E	F	E	F	D	C	E	A	F	F	A	D
Approach Vol, veh/h		404			467			878			1151	
Approach Delay, s/veh		142.5			127.2			178.3			99.9	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.8	81.2	24.0	26.0	31.0	64.0	13.7	36.3
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 12	72.6	* 19	19.8	* 26	57.8	* 12	27.4
Max Q Clear Time (g_c+I1), s	7.3	64.0	21.3	21.8	28.3	59.8	7.1	14.2
Green Ext Time (p_c), s	0.0	4.2	0.0	0.0	0.0	0.0	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	134.0
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Intersection				
Intersection Delay, s/veh	175.6			
Intersection LOS	F			

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	414	769	887	1154
Demand Flow Rate, veh/h	422	784	905	1177
Vehicles Circulating, veh/h	1390	712	715	486
Vehicles Exiting, veh/h	273	908	1097	1010
Ped Vol Crossing Leg, #/h	0	2	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	173.6	116.6	191.2	203.6
Approach LOS	F	F	F	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	422	784	905	1177
Cap Entry Lane, veh/h	334	668	665	841
Entry HV Adj Factor	0.980	0.981	0.981	0.981
Flow Entry, veh/h	414	769	887	1154
Cap Entry, veh/h	328	654	653	824
V/C Ratio	1.262	1.175	1.360	1.400
Control Delay, s/veh	173.6	116.6	191.2	203.6
LOS	F	F	F	F
95th %tile Queue, veh	19	26	38	50

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	196	104	222	214	302	122	668	191	330	645	46
Future Volume (veh/h)	87	196	104	222	214	302	122	668	191	330	645	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	87	196	91	222	214	104	122	668	185	330	645	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	56	125	58	171	164	290	126	433	120	226	634	41
Arrive On Green	0.15	0.15	0.15	0.21	0.21	0.21	0.08	0.35	0.35	0.14	0.41	0.41
Sat Flow, veh/h	366	825	383	831	801	1415	1594	1254	347	1594	1554	101
Grp Volume(v), veh/h	374	0	0	436	0	104	122	0	853	330	0	687
Grp Sat Flow(s),veh/h/ln	1574	0	0	1632	0	1415	1594	0	1601	1594	0	1655
Q Serve(g_s), s	22.8	0.0	0.0	30.8	0.0	9.5	11.4	0.0	51.8	21.3	0.0	61.2
Cycle Q Clear(g_c), s	22.8	0.0	0.0	30.8	0.0	9.5	11.4	0.0	51.8	21.3	0.0	61.2
Prop In Lane	0.23		0.24	0.51		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	239	0	0	335	0	290	126	0	553	226	0	675
V/C Ratio(X)	1.56	0.00	0.00	1.30	0.00	0.36	0.96	0.00	1.54	1.46	0.00	1.02
Avail Cap(c_a), veh/h	239	0	0	335	0	290	126	0	553	226	0	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.6	0.0	0.0	59.6	0.0	51.1	68.8	0.0	49.1	64.3	0.0	44.4
Incr Delay (d2), s/veh	273.0	0.0	0.0	155.7	0.0	1.1	68.5	0.0	253.2	228.9	0.0	39.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.0	0.0	0.0	27.0	0.0	3.4	7.0	0.0	58.9	22.9	0.0	31.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	336.6	0.0	0.0	215.3	0.0	52.2	137.4	0.0	302.3	293.3	0.0	83.5
LnGrp LOS	F	A	A	F	A	D	F	A	F	F	A	F
Approach Vol, veh/h		374			540			975			1017	
Approach Delay, s/veh		336.6			183.9			281.7			151.5	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	16.6	67.4	29.0	26.0	58.0	37.0
Change Period (Y+Rc), s	* 4.7	6.2	6.2	* 4.7	6.2	6.2
Max Green Setting (Gmax), s	* 12	61.2	22.8	* 21	51.8	30.8
Max Q Clear Time (g_c+I1), s	13.4	63.2	24.8	23.3	53.8	32.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	225.0
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	11	88	74	5	36	79	724	23	6	691	176
Future Volume (veh/h)	111	11	88	74	5	36	79	724	23	6	691	176
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	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			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	111	11	2	74	5	25	79	724	17	6	691	164
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	137	25	155	23	116	134	1041	862	24	720	171
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.08	0.62	0.62	0.02	0.55	0.55
Sat Flow, veh/h	1594	1378	251	1594	238	1188	1594	1673	1386	1594	1301	309
Grp Volume(v), veh/h	111	0	13	74	0	30	79	724	17	6	0	855
Grp Sat Flow(s),veh/h/ln	1594	0	1628	1594	0	1426	1594	1673	1386	1594	0	1610
Q Serve(g_s), s	7.3	0.0	0.8	4.7	0.0	2.1	5.2	31.1	0.5	0.4	0.0	54.6
Cycle Q Clear(g_c), s	7.3	0.0	0.8	4.7	0.0	2.1	5.2	31.1	0.5	0.4	0.0	54.6
Prop In Lane	1.00		0.15	1.00		0.83	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	158	0	162	155	0	139	134	1041	862	24	0	891
V/C Ratio(X)	0.70	0.00	0.08	0.48	0.00	0.22	0.59	0.70	0.02	0.25	0.00	0.96
Avail Cap(c_a), veh/h	164	0	167	281	0	251	151	1041	862	148	0	922
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.0	0.0	44.1	46.1	0.0	44.9	47.7	13.6	7.8	52.5	0.0	23.0
Incr Delay (d2), s/veh	10.0	0.0	0.1	0.8	0.0	0.3	2.4	2.2	0.0	1.9	0.0	20.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.3	1.9	0.0	0.8	2.1	10.5	0.1	0.2	0.0	23.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.1	0.0	44.2	47.0	0.0	45.2	50.0	15.8	7.8	54.5	0.0	43.3
LnGrp LOS	E	A	D	D	A	D	D	B	A	D	A	D
Approach Vol, veh/h		124			104			820			861	
Approach Delay, s/veh		55.7			46.4			19.0			43.4	
Approach LOS		E			D			B			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.8	65.5		14.2	5.3	73.0		15.4
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7
Max Green Setting (Gmax), s	10.3	61.8		19.0	10.0	62.0		11.1
Max Q Clear Time (g_c+I1), s	7.2	56.6		6.7	2.4	33.1		9.3
Green Ext Time (p_c), s	0.0	3.2		0.1	0.0	7.6		0.0

Intersection Summary	
HCM 6th Ctrl Delay	33.9
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	22	105	32	14	16	87	689	34	19	822	59
Future Volume (veh/h)	84	22	105	32	14	16	87	689	34	19	822	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.98		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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	84	22	28	32	14	-9	87	689	0	19	822	-6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	249	56	220	319	142	0	131	951	806	54	870	737
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.00	0.08	0.57	0.00	0.03	0.52	0.00
Sat Flow, veh/h	1088	350	1383	716	364	-211	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	106	0	28	0	0	0	87	689	0	19	822	-6
Grp Sat Flow(s),veh/h/ln	1438	0	1383	0	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	5.1	0.0	1.5	0.0	0.0	0.0	4.5	25.6	0.0	1.0	39.2	0.0
Cycle Q Clear(g_c), s	5.6	0.0	1.5	0.0	0.0	0.0	4.5	25.6	0.0	1.0	39.2	0.0
Prop In Lane	0.79		1.00	0.86		-0.24	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	305	0	220	0	0	0	131	951	806	54	870	737
V/C Ratio(X)	0.35	0.00	0.13	0.00	0.00	0.00	0.66	0.72	0.00	0.35	0.94	-0.01
Avail Cap(c_a), veh/h	517	0	425	0	0	0	151	951	806	151	906	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.2	0.0	30.5	0.0	0.0	0.0	37.7	13.4	0.0	39.9	19.2	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.1	0.0	0.0	0.0	5.8	3.0	0.0	1.4	17.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.5	0.0	0.0	0.0	1.9	9.0	0.0	0.4	17.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.5	0.0	30.6	0.0	0.0	0.0	43.5	16.4	0.0	41.4	37.1	0.0
LnGrp LOS	C	A	C	A	A	A	D	B	A	D	D	A
Approach Vol, veh/h		134			0			776			835	
Approach Delay, s/veh		32.1			0.0			19.5			37.5	
Approach LOS		C						B			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.7	52.8		21.2	6.6	56.9		21.2
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7
Max Green Setting (Gmax), s	8.0	45.8		* 26	8.0	45.8		* 26
Max Q Clear Time (g_c+I1), s	6.5	41.2		0.0	3.0	27.6		7.6
Green Ext Time (p_c), s	0.0	2.8		0.0	0.0	6.2		0.4

Intersection Summary	
HCM 6th Ctrl Delay	29.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection			
Intersection Delay, s/veh	22.6		
Intersection LOS	C		

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	245	1037	997
Demand Flow Rate, veh/h	250	1058	1017
Vehicles Circulating, veh/h	847	85	194
Vehicles Exiting, veh/h	364	1012	949
Ped Vol Crossing Leg, #/h	4	4	4
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	13.2	19.8	27.8
Approach LOS	B	C	D

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	250	1058	1017
Cap Entry Lane, veh/h	582	1265	1132
Entry HV Adj Factor	0.980	0.980	0.981
Flow Entry, veh/h	245	1037	997
Cap Entry, veh/h	570	1240	1110
V/C Ratio	0.430	0.837	0.899
Control Delay, s/veh	13.2	19.8	27.8
LOS	B	C	D
95th %tile Queue, veh	2	11	14

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	964	39	53	999	35	62
Future Vol, veh/h	964	39	53	999	35	62
Conflicting Peds, #/hr	0	27	19	0	27	19
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	964	39	53	999	35	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1030	0	2143	1030
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	1132	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	674	-	54	283
Stage 1	-	-	-	-	352	-
Stage 2	-	-	-	-	308	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	659	-	48	272
Mov Cap-2 Maneuver	-	-	-	-	162	-
Stage 1	-	-	-	-	344	-
Stage 2	-	-	-	-	277	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	34.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	218	-	-	659	-
HCM Lane V/C Ratio	0.445	-	-	0.08	-
HCM Control Delay (s)	34.1	-	-	10.9	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.1	-	-	0.3	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	847	0	0	898	120	0	109	0	183	0	136
Future Volume (veh/h)	94	847	0	0	898	120	0	109	0	183	0	136
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	94	847	0	0	898	14	0	109	0	183	0	-8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0	2	0	2
Cap, veh/h	99	1031	0	0	874	725	0	299	0	184	0	0
Arrive On Green	0.06	0.62	0.00	0.00	0.52	0.52	0.00	0.18	0.00	0.12	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1388	0	1673	0	1594	183	
Grp Volume(v), veh/h	94	847	0	0	898	14	0	109	0	183	130.4	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1388	0	1673	0	1594	F	
Q Serve(g_s), s	8.8	58.9	0.0	0.0	78.2	0.7	0.0	8.6	0.0	17.2		
Cycle Q Clear(g_c), s	8.8	58.9	0.0	0.0	78.2	0.7	0.0	8.6	0.0	17.2		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	99	1031	0	0	874	725	0	299	0	184		
V/C Ratio(X)	0.95	0.82	0.00	0.00	1.03	0.02	0.00	0.37	0.00	0.99		
Avail Cap(c_a), veh/h	99	1031	0	0	874	725	0	302	0	184		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	70.0	22.4	0.0	0.0	35.8	17.3	0.0	54.0	0.0	66.1		
Incr Delay (d2), s/veh	73.3	5.4	0.0	0.0	37.6	0.0	0.0	1.6	0.0	64.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.6	24.0	0.0	0.0	40.6	0.2	0.0	3.8	0.0	10.3		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	143.3	27.8	0.0	0.0	73.4	17.3	0.0	55.6	0.0	130.4		
LnGrp LOS	F	C	A	A	F	B	A	E	A	F		
Approach Vol, veh/h		941			912			109				
Approach Delay, s/veh		39.3			72.5			55.6				
Approach LOS		D			E			E				

Timer - Assigned Phs		2			5	6	7	8
Phs Duration (G+Y+Rc), s		98.0			14.0	84.0	22.0	29.7
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0
Max Green Setting (Gmax), s		92.2			* 9.3	78.2	* 17	27.0
Max Q Clear Time (g_c+I1), s		60.9			10.8	80.2	19.2	10.6
Green Ext Time (p_c), s		7.6			0.0	0.0	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	62.0
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	196	104	222	214	302	122	668	191	330	645	46
Future Volume (veh/h)	87	196	104	222	214	302	122	668	191	330	645	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	87	196	91	222	214	104	122	668	185	330	645	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	154	71	190	328	515	141	526	146	267	774	50
Arrive On Green	0.07	0.14	0.14	0.12	0.20	0.20	0.09	0.42	0.42	0.17	0.50	0.50
Sat Flow, veh/h	1594	1070	497	1594	1673	1415	1594	1254	347	1594	1554	101
Grp Volume(v), veh/h	87	0	287	222	214	104	122	0	853	330	0	687
Grp Sat Flow(s),veh/h/ln	1594	0	1567	1594	1673	1415	1594	0	1601	1594	0	1655
Q Serve(g_s), s	7.8	0.0	20.8	17.3	17.1	7.3	11.0	0.0	60.8	24.3	0.0	51.6
Cycle Q Clear(g_c), s	7.8	0.0	20.8	17.3	17.1	7.3	11.0	0.0	60.8	24.3	0.0	51.6
Prop In Lane	1.00		0.32	1.00		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	107	0	225	190	328	515	141	0	671	267	0	825
V/C Ratio(X)	0.82	0.00	1.28	1.17	0.65	0.20	0.86	0.00	1.27	1.24	0.00	0.83
Avail Cap(c_a), veh/h	137	0	225	190	328	515	148	0	671	267	0	825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.8	0.0	62.1	63.8	53.8	31.7	65.2	0.0	42.1	60.3	0.0	31.2
Incr Delay (d2), s/veh	19.7	0.0	154.3	117.6	5.2	0.3	34.5	0.0	133.2	133.9	0.0	7.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	17.7	13.1	7.6	2.5	5.7	0.0	47.7	19.6	0.0	21.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.5	0.0	216.4	181.5	58.9	32.0	99.7	0.0	175.3	194.3	0.0	38.8
LnGrp LOS	F	A	F	F	E	C	F	A	F	F	A	D
Approach Vol, veh/h		374			540			975			1017	
Approach Delay, s/veh		186.1			104.1			165.9			89.3	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.6	78.4	22.0	27.0	29.0	67.0	14.4	34.6
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 14	71.6	* 17	20.8	* 24	60.8	* 13	25.6
Max Q Clear Time (g_c+I1), s	13.0	53.6	19.3	22.8	26.3	62.8	9.8	19.1
Green Ext Time (p_c), s	0.0	5.8	0.0	0.0	0.0	0.0	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	130.2
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	196	104	222	214	302	122	668	191	330	645	46
Future Volume (veh/h)	87	196	104	222	214	302	122	668	191	330	645	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	87	196	91	222	214	104	122	668	185	330	645	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	193	158	190	280	484	142	553	153	278	818	53
Arrive On Green	0.07	0.12	0.12	0.12	0.17	0.17	0.09	0.44	0.44	0.17	0.53	0.53
Sat Flow, veh/h	1594	1673	1376	1594	1673	1414	1594	1254	347	1594	1554	101
Grp Volume(v), veh/h	87	196	91	222	214	104	122	0	853	330	0	687
Grp Sat Flow(s),veh/h/ln	1594	1673	1376	1594	1673	1414	1594	0	1601	1594	0	1655
Q Serve(g_s), s	7.8	16.7	9.1	17.3	17.7	7.6	11.0	0.0	63.9	25.3	0.0	48.7
Cycle Q Clear(g_c), s	7.8	16.7	9.1	17.3	17.7	7.6	11.0	0.0	63.9	25.3	0.0	48.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	107	193	158	190	280	484	142	0	706	278	0	871
V/C Ratio(X)	0.82	1.02	0.57	1.17	0.76	0.21	0.86	0.00	1.21	1.19	0.00	0.79
Avail Cap(c_a), veh/h	110	193	158	190	280	484	170	0	706	278	0	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.8	64.2	60.8	63.8	57.6	33.9	65.2	0.0	40.6	59.8	0.0	27.8
Incr Delay (d2), s/veh	33.0	69.3	6.1	117.6	12.4	0.3	26.5	0.0	106.9	114.3	0.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	10.6	3.4	13.1	8.4	2.6	5.4	0.0	44.9	18.8	0.0	19.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.8	133.4	66.9	181.5	70.0	34.2	91.6	0.0	147.5	174.1	0.0	33.0
LnGrp LOS	F	F	E	F	E	C	F	A	F	F	A	C
Approach Vol, veh/h		374			540			975			1017	
Approach Delay, s/veh		109.4			109.0			140.5			78.8	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.6	82.5	22.0	22.9	30.0	70.1	14.4	30.5
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 16	73.7	* 17	16.7	* 25	63.9	* 10	24.0
Max Q Clear Time (g_c+I1), s	13.0	50.7	19.3	18.7	27.3	65.9	9.8	19.7
Green Ext Time (p_c), s	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	109.0
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Intersection	
Intersection Delay, s/veh	176.1
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	387	738	981	1021
Demand Flow Rate, veh/h	395	752	1000	1042
Vehicles Circulating, veh/h	1221	894	626	568
Vehicles Exiting, veh/h	389	732	990	1078
Ped Vol Crossing Leg, #/h	1	2	0	1
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	77.3	194.1	194.4	183.0
Approach LOS	F	F	F	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	395	752	1000	1042
Cap Entry Lane, veh/h	397	554	729	773
Entry HV Adj Factor	0.980	0.981	0.981	0.980
Flow Entry, veh/h	387	738	981	1021
Cap Entry, veh/h	389	544	715	758
V/C Ratio	0.994	1.356	1.372	1.348
Control Delay, s/veh	77.3	194.1	194.4	183.0
LOS	F	F	F	F
95th %tile Queue, veh	12	33	42	42

HCM 6th Roundabout
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln 08/29/2023

Intersection			
Intersection Delay, s/veh	22.6		
Intersection LOS	C		

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	245	1037	997
Demand Flow Rate, veh/h	250	1058	1017
Vehicles Circulating, veh/h	847	85	194
Vehicles Exiting, veh/h	364	1012	949
Ped Vol Crossing Leg, #/h	4	4	4
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	13.2	19.8	27.8
Approach LOS	B	C	D

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	250	1058	1017
Cap Entry Lane, veh/h	582	1265	1132
Entry HV Adj Factor	0.980	0.980	0.981
Flow Entry, veh/h	245	1037	997
Cap Entry, veh/h	570	1240	1110
V/C Ratio	0.430	0.837	0.899
Control Delay, s/veh	13.2	19.8	27.8
LOS	B	C	D
95th %tile Queue, veh	2	11	14

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	158	57	113	123	260	48	427	100	221	489	41
Future Volume (veh/h)	50	158	57	113	123	260	48	427	100	221	489	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	184	56	131	143	0	56	497	107	257	569	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	62	198	60	140	153	254	104	398	86	238	585	46
Arrive On Green	0.20	0.20	0.20	0.18	0.18	0.00	0.07	0.30	0.30	0.15	0.38	0.38
Sat Flow, veh/h	312	990	301	781	853	1418	1594	1334	287	1594	1531	121
Grp Volume(v), veh/h	298	0	0	274	0	0	56	0	604	257	0	614
Grp Sat Flow(s),veh/h/ln	1604	0	0	1634	0	1418	1594	0	1621	1594	0	1652
Q Serve(g_s), s	24.5	0.0	0.0	22.2	0.0	0.0	4.6	0.0	40.0	20.0	0.0	49.0
Cycle Q Clear(g_c), s	24.5	0.0	0.0	22.2	0.0	0.0	4.6	0.0	40.0	20.0	0.0	49.0
Prop In Lane	0.19		0.19	0.48		1.00	1.00		0.18	1.00		0.07
Lane Grp Cap(c), veh/h	320	0	0	293	0	254	104	0	483	238	0	631
V/C Ratio(X)	0.93	0.00	0.00	0.94	0.00	0.00	0.54	0.00	1.25	1.08	0.00	0.97
Avail Cap(c_a), veh/h	335	0	0	293	0	254	190	0	483	238	0	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	0.0	0.0	54.3	0.0	0.0	60.7	0.0	47.0	57.0	0.0	40.7
Incr Delay (d2), s/veh	31.6	0.0	0.0	36.4	0.0	0.0	1.6	0.0	128.5	81.6	0.0	29.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	0.0	0.0	11.9	0.0	0.0	1.9	0.0	32.8	13.2	0.0	24.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.3	0.0	0.0	90.7	0.0	0.0	62.3	0.0	175.6	138.7	0.0	69.8
LnGrp LOS	F	A	A	F	A	A	E	A	F	F	A	E
Approach Vol, veh/h		298			274			660			871	
Approach Delay, s/veh		84.3			90.7			166.0			90.1	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.5	57.4		33.0	24.7	46.2		30.2
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2
Max Green Setting (Gmax), s	* 16	40.0		28.0	* 20	40.0		24.0
Max Q Clear Time (g_c+I1), s	6.6	51.0		26.5	22.0	42.0		24.2
Green Ext Time (p_c), s	0.0	0.0		0.3	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	113.2
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	53	70	83	36	53	44	396	71	50	479	137
Future Volume (veh/h)	151	53	70	83	36	53	44	396	71	50	479	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	178	62	21	98	42	7	52	466	5	59	564	143
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	158	54	205	179	30	130	749	631	138	583	148
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.08	0.45	0.45	0.09	0.45	0.45
Sat Flow, veh/h	1594	1187	402	1594	1393	232	1594	1673	1409	1594	1287	326
Grp Volume(v), veh/h	178	0	83	98	0	49	52	466	5	59	0	707
Grp Sat Flow(s),veh/h/ln	1594	0	1589	1594	0	1625	1594	1673	1409	1594	0	1613
Q Serve(g_s), s	9.6	0.0	4.2	5.0	0.0	2.4	2.7	18.7	0.2	3.1	0.0	37.5
Cycle Q Clear(g_c), s	9.6	0.0	4.2	5.0	0.0	2.4	2.7	18.7	0.2	3.1	0.0	37.5
Prop In Lane	1.00		0.25	1.00		0.14	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	213	0	212	205	0	209	130	749	631	138	0	730
V/C Ratio(X)	0.84	0.00	0.39	0.48	0.00	0.23	0.40	0.62	0.01	0.43	0.00	0.97
Avail Cap(c_a), veh/h	272	0	271	344	0	351	272	761	641	272	0	734
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.2	0.0	34.8	35.6	0.0	34.4	38.3	18.6	13.5	38.1	0.0	23.4
Incr Delay (d2), s/veh	13.4	0.0	0.4	0.6	0.0	0.2	0.7	1.8	0.0	0.8	0.0	25.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	1.6	2.0	0.0	1.0	1.0	6.8	0.1	1.2	0.0	17.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.5	0.0	35.3	36.2	0.0	34.6	39.0	20.4	13.5	38.8	0.0	48.9
LnGrp LOS	D	A	D	D	A	C	D	C	B	D	A	D
Approach Vol, veh/h		261			147			523			766	
Approach Delay, s/veh		45.7			35.7			22.2			48.2	
Approach LOS		D			D			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.9	45.6		15.0	11.3	45.2		16.4				
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7				
Max Green Setting (Gmax), s	15.0	40.0		19.0	15.0	40.0		15.0				
Max Q Clear Time (g_c+I1), s	11.7	39.5		7.0	5.1	20.7		11.6				
Green Ext Time (p_c), s	0.0	0.3		0.2	0.0	3.6		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			38.7									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	12	35	70	7	43	34	425	40	24	552	43
Future Volume (veh/h)	32	12	35	70	7	43	34	425	40	24	552	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	36	14	0	80	8	12	39	483	0	27	627	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	279	90	250	300	31	30	101	739	627	77	714	605
Arrive On Green	0.18	0.18	0.00	0.18	0.18	0.18	0.06	0.44	0.00	0.05	0.43	0.00
Sat Flow, veh/h	1001	511	1418	1093	177	173	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	50	0	0	100	0	0	39	483	0	27	627	0
Grp Sat Flow(s),veh/h/ln	1512	0	1418	1443	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	0.0	0.0	0.0	2.0	0.0	0.0	1.4	13.7	0.0	1.0	20.8	0.0
Cycle Q Clear(g_c), s	1.6	0.0	0.0	3.6	0.0	0.0	1.4	13.7	0.0	1.0	20.8	0.0
Prop In Lane	0.72		1.00	0.80		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	369	0	250	361	0	0	101	739	627	77	714	605
V/C Ratio(X)	0.14	0.00	0.00	0.28	0.00	0.00	0.38	0.65	0.00	0.35	0.88	0.00
Avail Cap(c_a), veh/h	738	0	609	720	0	0	290	830	703	290	830	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.2	0.0	0.0	22.0	0.0	0.0	27.2	13.2	0.0	27.9	15.9	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.2	0.0	0.0	0.9	1.9	0.0	1.0	10.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	1.2	0.0	0.0	0.5	4.6	0.0	0.4	8.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	0.0	0.0	22.1	0.0	0.0	28.1	15.2	0.0	28.9	26.1	0.0
LnGrp LOS	C	A	A	C	A	A	C	B	A	C	C	A
Approach Vol, veh/h		50			100			522			654	
Approach Delay, s/veh		21.2			22.1			16.1			26.2	
Approach LOS		C			C			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.5	34.6		18.4	6.6	35.5		18.4				
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7				
Max Green Setting (Gmax), s	11.0	30.0		* 26	11.0	30.0		* 26				
Max Q Clear Time (g_c+I1), s	3.4	22.8		5.6	3.0	15.7		3.6				
Green Ext Time (p_c), s	0.0	3.0		0.3	0.0	3.5		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			21.7									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	84	208	139	436	554	115
Future Vol, veh/h	84	208	139	436	554	115
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	250	150	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	239	160	501	637	132

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1466	645	641	0	-	0
Stage 1	641	-	-	-	-	-
Stage 2	825	-	-	-	-	-
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	141	472	943	-	-	0
Stage 1	525	-	-	-	-	0
Stage 2	430	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	116	469	940	-	-	-
Mov Cap-2 Maneuver	250	-	-	-	-	-
Stage 1	435	-	-	-	-	-
Stage 2	429	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.6	2.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	940	-	250	469	-
HCM Lane V/C Ratio	0.17	-	0.386	0.51	-
HCM Control Delay (s)	9.6	-	28.2	20.4	-
HCM Lane LOS	A	-	D	C	-
HCM 95th %tile Q(veh)	0.6	-	1.7	2.8	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	715	52	18	552	37	60
Future Vol, veh/h	715	52	18	552	37	60
Conflicting Peds, #/hr	0	19	13	0	19	13
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	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	813	59	20	627	42	68

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	891	0	1548	875
Stage 1	-	-	-	-	862	-
Stage 2	-	-	-	-	686	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	761	-	126	349
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	500	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	749	-	119	340
Mov Cap-2 Maneuver	-	-	-	-	255	-
Stage 1	-	-	-	-	407	-
Stage 2	-	-	-	-	479	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	23.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	302	-	-	749	-
HCM Lane V/C Ratio	0.365	-	-	0.027	-
HCM Control Delay (s)	23.6	-	-	9.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.6	-	-	0.1	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	566	0	0	413	135	0	189	0	166	0	130
Future Volume (veh/h)	154	566	0	0	413	135	0	189	0	166	0	130
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	173	636	0	0	464	0	0	212	0	187	0	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0	2	0	2
Cap, veh/h	201	779	0	0	491	416	0	445	0	215	0	0
Arrive On Green	0.13	0.47	0.00	0.00	0.29	0.00	0.00	0.27	0.00	0.14	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1418	0	1673	0	1594	187	
Grp Volume(v), veh/h	173	636	0	0	464	0	0	212	0	187	59.1	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1418	0	1673	0	1594	E	
Q Serve(g_s), s	10.8	33.2	0.0	0.0	27.4	0.0	0.0	10.8	0.0	11.6		
Cycle Q Clear(g_c), s	10.8	33.2	0.0	0.0	27.4	0.0	0.0	10.8	0.0	11.6		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	201	779	0	0	491	416	0	445	0	215		
V/C Ratio(X)	0.86	0.82	0.00	0.00	0.95	0.00	0.00	0.48	0.00	0.87		
Avail Cap(c_a), veh/h	252	779	0	0	496	420	0	446	0	283		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	43.4	23.3	0.0	0.0	35.0	0.0	0.0	31.2	0.0	42.9		
Incr Delay (d2), s/veh	18.3	6.8	0.0	0.0	27.5	0.0	0.0	1.7	0.0	16.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.2	13.9	0.0	0.0	14.8	0.0	0.0	4.6	0.0	5.6		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.7	30.1	0.0	0.0	62.5	0.0	0.0	32.9	0.0	59.1		
LnGrp LOS	E	C	A	A	E	A	A	C	A	E		
Approach Vol, veh/h		809			464			212				
Approach Delay, s/veh		36.8			62.5			32.9				
Approach LOS		D			E			C				

Timer - Assigned Phs		2			5	6	7	8
Phs Duration (G+Y+Rc), s		52.9			17.4	35.5	18.4	29.9
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0
Max Green Setting (Gmax), s		30.0			* 16	30.0	* 18	27.0
Max Q Clear Time (g_c+I1), s		35.2			12.8	29.4	13.6	12.8
Green Ext Time (p_c), s		0.0			0.1	0.2	0.1	1.8

Intersection Summary			
HCM 6th Ctrl Delay			45.9
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	158	57	113	123	260	48	427	100	221	489	41
Future Volume (veh/h)	50	158	57	113	123	260	48	427	100	221	489	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	184	56	131	143	0	56	497	107	257	569	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	209	64	154	321	509	118	491	106	267	706	56
Arrive On Green	0.08	0.17	0.17	0.10	0.19	0.00	0.07	0.37	0.37	0.17	0.46	0.46
Sat Flow, veh/h	1594	1231	375	1594	1673	1418	1594	1334	287	1594	1531	121
Grp Volume(v), veh/h	58	0	240	131	143	0	56	0	604	257	0	614
Grp Sat Flow(s),veh/h/ln	1594	0	1606	1594	1673	1418	1594	0	1621	1594	0	1652
Q Serve(g_s), s	3.9	0.0	16.1	8.9	8.3	0.0	3.7	0.0	40.7	17.7	0.0	35.2
Cycle Q Clear(g_c), s	3.9	0.0	16.1	8.9	8.3	0.0	3.7	0.0	40.7	17.7	0.0	35.2
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.18	1.00		0.07
Lane Grp Cap(c), veh/h	120	0	273	154	321	509	118	0	597	267	0	762
V/C Ratio(X)	0.48	0.00	0.88	0.85	0.45	0.00	0.47	0.00	1.01	0.96	0.00	0.81
Avail Cap(c_a), veh/h	144	0	339	154	363	545	144	0	597	267	0	762
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.0	0.0	44.7	49.1	39.5	0.0	49.1	0.0	34.9	45.7	0.0	25.5
Incr Delay (d2), s/veh	1.1	0.0	20.6	32.1	1.4	0.0	1.1	0.0	39.8	44.6	0.0	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	7.7	4.9	3.5	0.0	1.5	0.0	21.6	10.0	0.0	14.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.2	0.0	65.4	81.2	40.9	0.0	50.2	0.0	74.7	90.2	0.0	32.1
LnGrp LOS	D	A	E	F	D	A	D	A	F	F	A	C
Approach Vol, veh/h		298			274			660			871	
Approach Delay, s/veh		62.4			60.1			72.6			49.3	
Approach LOS		E			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	57.2	15.4	25.0	23.2	46.9	13.0	27.4
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 10	49.2	* 11	23.3	* 19	40.7	* 10	24.0
Max Q Clear Time (g_c+I1), s	5.7	37.2	10.9	18.1	19.7	42.7	5.9	10.3
Green Ext Time (p_c), s	0.0	4.0	0.0	0.7	0.0	0.0	0.0	0.7

Intersection Summary			
HCM 6th Ctrl Delay			59.9
HCM 6th LOS			E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	158	57	113	123	260	48	427	100	221	489	41
Future Volume (veh/h)	50	158	57	113	123	260	48	427	100	221	489	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	184	56	131	143	0	56	497	107	257	569	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	124	224	190	156	258	468	122	514	111	280	742	59
Arrive On Green	0.08	0.13	0.13	0.10	0.15	0.00	0.08	0.39	0.39	0.18	0.48	0.48
Sat Flow, veh/h	1594	1673	1418	1594	1673	1418	1594	1334	287	1594	1531	121
Grp Volume(v), veh/h	58	184	56	131	143	0	56	0	604	257	0	614
Grp Sat Flow(s),veh/h/ln	1594	1673	1418	1594	1673	1418	1594	0	1621	1594	0	1652
Q Serve(g_s), s	3.7	11.3	3.7	8.5	8.3	0.0	3.5	0.0	38.4	16.7	0.0	32.1
Cycle Q Clear(g_c), s	3.7	11.3	3.7	8.5	8.3	0.0	3.5	0.0	38.4	16.7	0.0	32.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.07
Lane Grp Cap(c), veh/h	124	224	190	156	258	468	122	0	625	280	0	800
V/C Ratio(X)	0.47	0.82	0.30	0.84	0.55	0.00	0.46	0.00	0.97	0.92	0.00	0.77
Avail Cap(c_a), veh/h	151	331	280	200	382	573	151	0	627	280	0	800
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.5	44.4	41.1	46.7	41.2	0.0	46.5	0.0	31.7	42.6	0.0	22.3
Incr Delay (d2), s/veh	1.0	12.4	1.2	17.7	2.6	0.0	1.0	0.0	27.9	32.4	0.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.2	1.3	4.1	3.5	0.0	1.4	0.0	18.7	8.8	0.0	12.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.5	56.8	42.3	64.3	43.8	0.0	47.5	0.0	59.6	75.0	0.0	27.1
LnGrp LOS	D	E	D	E	D	A	D	A	E	E	A	C
Approach Vol, veh/h		298			274			660			871	
Approach Delay, s/veh		52.2			53.6			58.5			41.2	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.8	57.2	15.0	20.3	23.2	46.8	12.9	22.4
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 10	49.2	* 13	20.8	* 19	40.7	* 10	24.0
Max Q Clear Time (g_c+I1), s	5.5	34.1	10.5	13.3	18.7	40.4	5.7	10.3
Green Ext Time (p_c), s	0.0	4.6	0.0	0.8	0.0	0.1	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	49.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Intersection	
Intersection Delay, s/veh	27.8
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	308	576	669	874
Demand Flow Rate, veh/h	314	588	682	891
Vehicles Circulating, veh/h	976	623	509	337
Vehicles Exiting, veh/h	252	568	781	874
Ped Vol Crossing Leg, #/h	0	2	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	21.1	26.4	26.4	32.3
Approach LOS	C	D	D	D

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	314	588	682	891
Cap Entry Lane, veh/h	510	731	821	979
Entry HV Adj Factor	0.982	0.980	0.981	0.981
Flow Entry, veh/h	308	576	669	874
Cap Entry, veh/h	501	716	805	959
V/C Ratio	0.616	0.805	0.831	0.911
Control Delay, s/veh	21.1	26.4	26.4	32.3
LOS	C	D	D	D
95th %tile Queue, veh	4	8	9	14

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	167	99	93	162	198	109	513	84	240	516	46
Future Volume (veh/h)	87	167	99	93	162	198	109	513	84	240	516	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	92	176	90	98	171	0	115	540	82	253	543	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	84	160	82	106	184	250	136	419	64	236	548	44
Arrive On Green	0.21	0.21	0.21	0.18	0.18	0.00	0.09	0.30	0.30	0.15	0.36	0.36
Sat Flow, veh/h	403	772	395	599	1045	1418	1594	1414	215	1594	1527	124
Grp Volume(v), veh/h	358	0	0	269	0	0	115	0	622	253	0	587
Grp Sat Flow(s),veh/h/ln	1570	0	0	1644	0	1418	1594	0	1628	1594	0	1651
Q Serve(g_s), s	28.0	0.0	0.0	21.8	0.0	0.0	9.6	0.0	40.0	20.0	0.0	47.8
Cycle Q Clear(g_c), s	28.0	0.0	0.0	21.8	0.0	0.0	9.6	0.0	40.0	20.0	0.0	47.8
Prop In Lane	0.26		0.25	0.36		1.00	1.00		0.13	1.00		0.07
Lane Grp Cap(c), veh/h	325	0	0	290	0	250	136	0	482	236	0	593
V/C Ratio(X)	1.10	0.00	0.00	0.93	0.00	0.00	0.85	0.00	1.29	1.07	0.00	0.99
Avail Cap(c_a), veh/h	325	0	0	292	0	252	189	0	482	236	0	593
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.6	0.0	0.0	54.8	0.0	0.0	60.9	0.0	47.6	57.6	0.0	43.1
Incr Delay (d2), s/veh	79.6	0.0	0.0	34.6	0.0	0.0	16.7	0.0	145.5	79.2	0.0	34.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.8	0.0	0.0	11.7	0.0	0.0	4.4	0.0	35.1	13.0	0.0	24.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	133.1	0.0	0.0	89.4	0.0	0.0	77.6	0.0	193.1	136.7	0.0	77.6
LnGrp LOS	F	A	A	F	A	A	E	A	F	F	A	E
Approach Vol, veh/h		358			269			737			840	
Approach Delay, s/veh		133.1			89.4			175.1			95.4	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.2	54.7		34.2	24.7	46.2		30.0
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2
Max Green Setting (Gmax), s	* 16	40.0		28.0	* 20	40.0		24.0
Max Q Clear Time (g_c+I1), s	11.6	49.8		30.0	22.0	42.0		23.8
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		127.4
HCM 6th LOS		F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	12	87	25	5	15	59	485	16	10	610	132
Future Volume (veh/h)	165	12	87	25	5	15	59	485	16	10	610	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	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			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	168	12	1	26	5	4	60	495	10	10	622	123
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	212	203	17	118	63	50	145	917	759	40	651	129
Arrive On Green	0.13	0.13	0.13	0.07	0.07	0.07	0.09	0.55	0.55	0.02	0.48	0.48
Sat Flow, veh/h	1594	1524	127	1594	851	681	1594	1673	1386	1594	1351	267
Grp Volume(v), veh/h	168	0	13	26	0	9	60	495	10	10	0	745
Grp Sat Flow(s),veh/h/ln	1594	0	1651	1594	0	1532	1594	1673	1386	1594	0	1619
Q Serve(g_s), s	8.3	0.0	0.6	1.2	0.0	0.4	2.9	15.4	0.3	0.5	0.0	35.9
Cycle Q Clear(g_c), s	8.3	0.0	0.6	1.2	0.0	0.4	2.9	15.4	0.3	0.5	0.0	35.9
Prop In Lane	1.00		0.08	1.00		0.44	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	212	0	220	118	0	113	145	917	759	40	0	779
V/C Ratio(X)	0.79	0.00	0.06	0.22	0.00	0.08	0.41	0.54	0.01	0.25	0.00	0.96
Avail Cap(c_a), veh/h	294	0	305	373	0	358	294	917	759	294	0	797
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.1	0.0	30.8	35.4	0.0	35.1	34.9	11.8	8.4	38.9	0.0	20.2
Incr Delay (d2), s/veh	6.4	0.0	0.0	0.3	0.0	0.1	0.7	0.8	0.0	1.2	0.0	21.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	0.2	0.5	0.0	0.2	1.1	4.9	0.1	0.2	0.0	16.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.5	0.0	30.8	35.8	0.0	35.2	35.6	12.6	8.4	40.1	0.0	42.0
LnGrp LOS	D	A	C	D	A	D	D	B	A	D	A	D
Approach Vol, veh/h		181			35			565			755	
Approach Delay, s/veh		39.8			35.6			15.0			42.0	
Approach LOS		D			D			B			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.1	44.9		9.7	5.7	50.3		15.5
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7
Max Green Setting (Gmax), s	15.0	40.0		19.0	15.0	40.0		15.0
Max Q Clear Time (g_c+I1), s	4.9	37.9		3.2	2.5	17.4		10.3
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	4.2		0.1

Intersection Summary		
HCM 6th Ctrl Delay		31.6
HCM 6th LOS		C

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	6	77	45	14	25	66	506	34	19	612	65
Future Volume (veh/h)	68	6	77	45	14	25	66	506	34	19	612	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		1.00	0.98		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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	70	6	0	46	14	0	68	522	0	20	631	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	347	25	266	298	77	0	138	781	662	59	698	592
Arrive On Green	0.19	0.19	0.00	0.19	0.19	0.00	0.09	0.47	0.00	0.04	0.42	0.00
Sat Flow, veh/h	1290	134	1418	1070	409	0	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	76	0	0	60	0	0	68	522	0	20	631	0
Grp Sat Flow(s),veh/h/ln	1424	0	1418	1479	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	0.7	0.0	0.0	0.0	0.0	0.0	2.7	15.8	0.0	0.8	23.1	0.0
Cycle Q Clear(g_c), s	2.8	0.0	0.0	2.1	0.0	0.0	2.7	15.8	0.0	0.8	23.1	0.0
Prop In Lane	0.92		1.00	0.77		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	372	0	266	374	0	0	138	781	662	59	698	592
V/C Ratio(X)	0.20	0.00	0.00	0.16	0.00	0.00	0.49	0.67	0.00	0.34	0.90	0.00
Avail Cap(c_a), veh/h	665	0	563	677	0	0	268	781	662	268	767	650
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.7	0.0	0.0	22.4	0.0	0.0	28.5	13.5	0.0	30.7	17.8	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	0.0	1.0	2.5	0.0	1.2	13.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.7	0.0	0.0	1.0	5.5	0.0	0.3	10.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	0.0	0.0	22.5	0.0	0.0	29.5	16.0	0.0	32.0	31.7	0.0
LnGrp LOS	C	A	A	C	A	A	C	B	A	C	C	A
Approach Vol, veh/h		76			60			590			651	
Approach Delay, s/veh		22.8			22.5			17.6			31.7	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.4	36.1		20.0	6.1	39.4		20.0
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7
Max Green Setting (Gmax), s	11.0	30.0		* 26	11.0	30.0		* 26
Max Q Clear Time (g_c+I1), s	4.7	25.1		4.1	2.8	17.8		4.8
Green Ext Time (p_c), s	0.0	2.2		0.1	0.0	3.5		0.2

Intersection Summary	
HCM 6th Ctrl Delay	24.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln

08/22/2023

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	81	199	203	571	607	133
Future Vol, veh/h	81	199	203	571	607	133
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	250	150	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	84	207	211	595	632	139

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1657	640	636	0	-	0
Stage 1	636	-	-	-	-	-
Stage 2	1021	-	-	-	-	-
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	108	475	947	-	-	0
Stage 1	527	-	-	-	-	0
Stage 2	348	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 83	472	944	-	-	-
Mov Cap-2 Maneuver	209	-	-	-	-	-
Stage 1	408	-	-	-	-	-
Stage 2	347	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.8	2.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	944	-	209	472	-
HCM Lane V/C Ratio	0.224	-	0.404	0.439	-
HCM Control Delay (s)	9.9	-	33.4	18.5	-
HCM Lane LOS	A	-	D	C	-
HCM 95th %tile Q(veh)	0.9	-	1.8	2.2	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th TWSC
5: Murphy Ave & Healdsburg Ave 08/22/2023

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	739	66	25	768	22	41
Future Vol, veh/h	739	66	25	768	22	41
Conflicting Peds, #/hr	0	27	19	0	27	19
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	762	68	26	792	23	42

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	857	0	1694	842
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	871	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	783	-	102	364
Stage 1	-	-	-	-	431	-
Stage 2	-	-	-	-	410	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	765	-	94	350
Mov Cap-2 Maneuver	-	-	-	-	227	-
Stage 1	-	-	-	-	422	-
Stage 2	-	-	-	-	387	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	20.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	294	-	-	765	-
HCM Lane V/C Ratio	0.221	-	-	0.034	-
HCM Control Delay (s)	20.7	-	-	9.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St 08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	573	0	0	567	116	0	109	0	166	0	147
Future Volume (veh/h)	123	573	0	0	567	116	0	109	0	166	0	147
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	127	591	0	0	585	11	0	112	0	171	0	4
Peak Hour Factor	0.97	0.97	0.97	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	0	2	0	2	0	2
Cap, veh/h	154	773	0	0	529	438	0	451	0	201	0	0
Arrive On Green	0.10	0.46	0.00	0.00	0.32	0.32	0.00	0.27	0.00	0.13	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1387	0	1673	0	1594	171	
Grp Volume(v), veh/h	127	591	0	0	585	11	0	112	0	171	49.7	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1387	0	1673	0	1594	D	
Q Serve(g_s), s	7.4	27.9	0.0	0.0	30.0	0.5	0.0	5.0	0.0	10.0		
Cycle Q Clear(g_c), s	7.4	27.9	0.0	0.0	30.0	0.5	0.0	5.0	0.0	10.0		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	154	773	0	0	529	438	0	451	0	201		
V/C Ratio(X)	0.82	0.76	0.00	0.00	1.11	0.03	0.00	0.25	0.00	0.85		
Avail Cap(c_a), veh/h	269	773	0	0	529	438	0	476	0	302		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	42.1	21.2	0.0	0.0	32.5	22.4	0.0	27.1	0.0	40.6		
Incr Delay (d2), s/veh	4.2	4.6	0.0	0.0	71.4	0.0	0.0	0.6	0.0	9.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.1	11.3	0.0	0.0	22.4	0.2	0.0	2.0	0.0	4.4		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	25.8	0.0	0.0	103.9	22.4	0.0	27.7	0.0	49.7		
LnGrp LOS	D	C	A	A	F	C	A	C	A	D		
Approach Vol, veh/h		718			596			112				
Approach Delay, s/veh		29.4			102.4			27.7				
Approach LOS		C			F			C				
Timer - Assigned Phs		2			5	6	7	8				
Phs Duration (G+Y+Rc), s		49.7			13.9	35.8	16.7	28.6				
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0				
Max Green Setting (Gmax), s		30.0			* 16	30.0	* 18	27.0				
Max Q Clear Time (g_c+I1), s		29.9			9.4	32.0	12.0	7.0				
Green Ext Time (p_c), s		0.1			0.1	0.0	0.1	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			58.7									
HCM 6th LOS			E									

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd
08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	167	99	93	162	198	109	513	84	240	516	46
Future Volume (veh/h)	87	167	99	93	162	198	109	513	84	240	516	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	92	176	90	98	171	0	115	540	82	253	543	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	124	192	98	125	311	502	137	553	84	268	723	59
Arrive On Green	0.08	0.19	0.19	0.08	0.19	0.00	0.09	0.39	0.39	0.17	0.47	0.47
Sat Flow, veh/h	1594	1033	528	1594	1673	1418	1594	1414	215	1594	1527	124
Grp Volume(v), veh/h	92	0	266	98	171	0	115	0	622	253	0	587
Grp Sat Flow(s),veh/h/ln	1594	0	1562	1594	1673	1418	1594	0	1629	1594	0	1651
Q Serve(g_s), s	7.0	0.0	20.6	7.4	11.4	0.0	8.8	0.0	46.3	19.3	0.0	35.8
Cycle Q Clear(g_c), s	7.0	0.0	20.6	7.4	11.4	0.0	8.8	0.0	46.3	19.3	0.0	35.8
Prop In Lane	1.00		0.34	1.00		1.00	1.00		0.13	1.00		0.07
Lane Grp Cap(c), veh/h	124	0	290	125	311	502	137	0	637	268	0	782
V/C Ratio(X)	0.74	0.00	0.92	0.78	0.55	0.00	0.84	0.00	0.98	0.94	0.00	0.75
Avail Cap(c_a), veh/h	133	0	304	133	326	515	169	0	637	268	0	782
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	55.6	0.0	49.3	55.8	45.4	0.0	55.5	0.0	36.9	50.7	0.0	26.5
Incr Delay (d2), s/veh	15.9	0.0	31.2	22.0	2.4	0.0	21.8	0.0	29.7	39.7	0.0	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	10.2	3.7	4.9	0.0	4.3	0.0	22.6	10.4	0.0	14.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.5	0.0	80.5	77.8	47.8	0.0	77.2	0.0	66.6	90.4	0.0	30.9
LnGrp LOS	E	A	F	E	D	A	E	A	E	F	A	C
Approach Vol, veh/h		358			269			737			840	
Approach Delay, s/veh		78.2			58.7			68.3			48.8	
Approach LOS		E			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.3	64.5	14.4	29.0	25.4	54.4	14.3	29.1
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 13	55.8	* 10	24.0	* 21	48.2	* 10	24.0
Max Q Clear Time (g_c+I1), s	10.8	37.8	9.4	22.6	21.3	48.3	9.0	13.4
Green Ext Time (p_c), s	0.0	4.7	0.0	0.2	0.0	0.0	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	61.3
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd
08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	167	99	93	162	198	109	513	84	240	516	46
Future Volume (veh/h)	87	167	99	93	162	198	109	513	84	240	516	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	92	176	90	98	171	0	115	540	82	253	543	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	219	180	139	220	434	142	577	88	278	754	61
Arrive On Green	0.09	0.13	0.13	0.09	0.13	0.00	0.09	0.41	0.41	0.17	0.49	0.49
Sat Flow, veh/h	1594	1673	1378	1594	1673	1418	1594	1414	215	1594	1527	124
Grp Volume(v), veh/h	92	176	90	98	171	0	115	0	622	253	0	587
Grp Sat Flow(s),veh/h/ln	1594	1673	1378	1594	1673	1418	1594	0	1629	1594	0	1651
Q Serve(g_s), s	6.1	11.1	6.6	6.5	10.8	0.0	7.7	0.0	39.9	17.0	0.0	30.5
Cycle Q Clear(g_c), s	6.1	11.1	6.6	6.5	10.8	0.0	7.7	0.0	39.9	17.0	0.0	30.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.07
Lane Grp Cap(c), veh/h	137	219	180	139	220	434	142	0	664	278	0	815
V/C Ratio(X)	0.67	0.80	0.50	0.71	0.78	0.00	0.81	0.00	0.94	0.91	0.00	0.72
Avail Cap(c_a), veh/h	150	359	295	159	368	560	191	0	719	302	0	844
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.4	46.1	44.1	48.5	45.8	0.0	48.8	0.0	30.9	44.2	0.0	21.7
Incr Delay (d2), s/veh	7.3	9.4	3.0	8.6	8.1	0.0	12.7	0.0	19.3	27.2	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	5.0	2.4	2.9	4.9	0.0	3.5	0.0	18.0	8.5	0.0	11.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.7	55.5	47.1	57.1	53.9	0.0	61.6	0.0	50.3	71.4	0.0	24.9
LnGrp LOS	E	E	D	E	D	A	E	A	D	E	A	C
Approach Vol, veh/h		358			269			737			840	
Approach Delay, s/veh		53.4			55.1			52.0			38.9	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.4	60.1	14.2	20.5	23.8	50.7	14.1	20.6
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 13	55.8	* 11	23.4	* 21	48.2	* 10	24.0
Max Q Clear Time (g_c+I1), s	9.7	32.5	8.5	13.1	19.0	41.9	8.1	12.8
Green Ext Time (p_c), s	0.0	5.2	0.0	1.1	0.1	2.6	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd
08/29/2023

Intersection				
Intersection Delay, s/veh	34.5			
Intersection LOS	D			

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	372	477	743	844
Demand Flow Rate, veh/h	380	486	758	861
Vehicles Circulating, veh/h	912	762	532	391
Vehicles Exiting, veh/h	340	528	760	857
Ped Vol Crossing Leg, #/h	1	2	0	1
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	24.4	26.0	42.8	36.5
Approach LOS	C	D	E	E

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	380	486	758	861
Cap Entry Lane, veh/h	544	634	802	926
Entry HV Adj Factor	0.980	0.981	0.980	0.980
Flow Entry, veh/h	372	477	743	844
Cap Entry, veh/h	534	622	786	908
V/C Ratio	0.698	0.766	0.945	0.930
Control Delay, s/veh	24.4	26.0	42.8	36.5
LOS	C	D	E	E
95th %tile Queue, veh	5	7	14	14

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St
08/23/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	573	0	0	567	116	0	109	0	166	0	147
Future Volume (veh/h)	123	573	0	0	567	116	0	109	0	166	0	147
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	127	591	0	0	585	11	0	112	0	171	0	4
Peak Hour Factor	0.97	0.97	0.97	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	0	2	0	2	0	2
Cap, veh/h	145	817	0	0	585	485	0	436	0	182	0	0
Arrive On Green	0.09	0.49	0.00	0.00	0.35	0.35	0.00	0.26	0.00	0.11	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1387	0	1673	0	1594	171	
Grp Volume(v), veh/h	127	591	0	0	585	11	0	112	0	171	91.7	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1387	0	1673	0	1594	F	
Q Serve(g_s), s	7.8	27.6	0.0	0.0	34.5	0.5	0.0	5.2	0.0	10.5		
Cycle Q Clear(g_c), s	7.8	27.6	0.0	0.0	34.5	0.5	0.0	5.2	0.0	10.5		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	145	817	0	0	585	485	0	436	0	182		
V/C Ratio(X)	0.87	0.72	0.00	0.00	1.00	0.02	0.00	0.26	0.00	0.94		
Avail Cap(c_a), veh/h	145	817	0	0	585	485	0	458	0	182		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	44.3	20.0	0.0	0.0	32.1	21.1	0.0	28.9	0.0	43.4		
Incr Delay (d2), s/veh	39.2	3.2	0.0	0.0	37.4	0.0	0.0	0.7	0.0	48.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.6	10.9	0.0	0.0	19.7	0.2	0.0	2.2	0.0	6.6		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.5	23.2	0.0	0.0	69.5	21.1	0.0	29.6	0.0	91.7		
LnGrp LOS	F	C	A	A	F	C	A	C	A	F		
Approach Vol, veh/h		718			596			112				
Approach Delay, s/veh		33.9			68.6			29.6				
Approach LOS		C			E			C				

Timer - Assigned Phs		2			5	6	7	8
Phs Duration (G+Y+Rc), s		54.0			13.7	40.3	16.0	28.7
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0
Max Green Setting (Gmax), s		48.2			* 9	34.5	* 11	27.0
Max Q Clear Time (g_c+I1), s		29.6			9.8	36.5	12.5	7.2
Green Ext Time (p_c), s		3.8			0.0	0.0	0.0	0.9

Intersection Summary		
HCM 6th Ctrl Delay		52.7
HCM 6th LOS		D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	233	74	223	138	303	54	502	218	321	631	41
Future Volume (veh/h)	50	233	74	223	138	303	54	502	218	321	631	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	271	76	259	160	50	63	584	244	373	734	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	35	164	46	199	123	282	99	387	162	237	674	41
Arrive On Green	0.15	0.15	0.15	0.20	0.20	0.20	0.06	0.35	0.35	0.15	0.43	0.43
Sat Flow, veh/h	230	1076	302	1003	620	1418	1594	1120	468	1594	1561	96
Grp Volume(v), veh/h	405	0	0	419	0	50	63	0	828	373	0	779
Grp Sat Flow(s),veh/h/ln	1608	0	0	1623	0	1418	1594	0	1588	1594	0	1656
Q Serve(g_s), s	22.8	0.0	0.0	29.8	0.0	4.4	5.8	0.0	51.8	22.3	0.0	64.8
Cycle Q Clear(g_c), s	22.8	0.0	0.0	29.8	0.0	4.4	5.8	0.0	51.8	22.3	0.0	64.8
Prop In Lane	0.14		0.19	0.62		1.00	1.00		0.29	1.00		0.06
Lane Grp Cap(c), veh/h	244	0	0	322	0	282	99	0	548	237	0	716
V/C Ratio(X)	1.66	0.00	0.00	1.30	0.00	0.18	0.64	0.00	1.51	1.57	0.00	1.09
Avail Cap(c_a), veh/h	244	0	0	322	0	282	106	0	548	237	0	716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.6	0.0	0.0	60.1	0.0	49.9	68.7	0.0	49.1	63.8	0.0	42.6
Incr Delay (d2), s/veh	313.3	0.0	0.0	155.6	0.0	0.4	7.8	0.0	238.9	277.8	0.0	60.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.4	0.0	0.0	26.0	0.0	1.6	2.5	0.0	56.2	27.2	0.0	37.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	376.9	0.0	0.0	215.7	0.0	50.3	76.5	0.0	288.0	341.6	0.0	102.8
LnGrp LOS	F	A	A	F	A	D	E	A	F	F	A	F
Approach Vol, veh/h		405			469			891			1152	
Approach Delay, s/veh		376.9			198.1			273.1			180.1	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	71.0		29.0	27.0	58.0		36.0				
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2				
Max Green Setting (Gmax), s	* 10	64.1		22.8	* 22	51.8		29.8				
Max Q Clear Time (g_c+I1), s	7.8	66.8		24.8	24.3	53.8		31.8				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			238.7									
HCM 6th LOS			F									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	53	98	83	36	53	37	447	71	50	593	135
Future Volume (veh/h)	180	53	98	83	36	53	37	447	71	50	593	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	180	53	46	83	36	6	37	447	4	50	593	120
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	216	111	96	205	179	30	109	745	628	129	619	125
Arrive On Green	0.14	0.14	0.14	0.13	0.13	0.13	0.07	0.45	0.45	0.08	0.46	0.46
Sat Flow, veh/h	1594	816	708	1594	1393	232	1594	1673	1409	1594	1350	273
Grp Volume(v), veh/h	180	0	99	83	0	42	37	447	4	50	0	713
Grp Sat Flow(s),veh/h/ln	1594	0	1524	1594	0	1625	1594	1673	1409	1594	0	1623
Q Serve(g_s), s	9.4	0.0	5.1	4.1	0.0	2.0	1.9	17.3	0.1	2.6	0.0	36.4
Cycle Q Clear(g_c), s	9.4	0.0	5.1	4.1	0.0	2.0	1.9	17.3	0.1	2.6	0.0	36.4
Prop In Lane	1.00		0.46	1.00		0.14	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	216	0	207	205	0	209	109	745	628	129	0	744
V/C Ratio(X)	0.83	0.00	0.48	0.40	0.00	0.20	0.34	0.60	0.01	0.39	0.00	0.96
Avail Cap(c_a), veh/h	279	0	267	353	0	360	279	781	657	279	0	758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.1	0.0	34.2	34.3	0.0	33.4	38.1	18.0	13.2	37.3	0.0	22.4
Incr Delay (d2), s/veh	12.4	0.0	0.6	0.5	0.0	0.2	0.7	1.5	0.0	0.7	0.0	23.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	1.9	1.6	0.0	0.8	0.7	6.2	0.0	1.0	0.0	16.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.4	0.0	34.9	34.8	0.0	33.6	38.8	19.4	13.2	38.0	0.0	45.4
LnGrp LOS	D	A	C	C	A	C	D	B	B	D	A	D
Approach Vol, veh/h		279			125			488			763	
Approach Delay, s/veh		43.6			34.4			20.9			44.9	
Approach LOS		D			C			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	45.1		14.7	10.7	44.0		16.3				
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7				
Max Green Setting (Gmax), s	15.0	40.0		19.0	15.0	40.0		15.0				
Max Q Clear Time (g_c+I1), s	11.9	38.4		6.1	4.6	19.3		11.4				
Green Ext Time (p_c), s	0.0	0.9		0.2	0.0	3.5		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			36.8									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave 08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	12	37	70	10	43	40	569	35	24	686	43
Future Volume (veh/h)	32	12	37	70	10	43	40	569	35	24	686	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	32	12	2	70	10	10	40	569	-5	24	686	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	84	236	262	36	24	102	783	663	69	749	634
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.06	0.47	0.00	0.04	0.45	0.00
Sat Flow, veh/h	1021	502	1410	954	215	146	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	44	0	2	90	0	0	40	569	-5	24	686	0
Grp Sat Flow(s),veh/h/ln	1523	0	1410	1315	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	0.0	0.0	0.1	2.9	0.0	0.0	1.5	17.2	0.0	0.9	24.1	0.0
Cycle Q Clear(g_c), s	1.4	0.0	0.1	4.4	0.0	0.0	1.5	17.2	0.0	0.9	24.1	0.0
Prop In Lane	0.73		1.00	0.78		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	354	0	236	322	0	0	102	783	663	69	749	634
V/C Ratio(X)	0.12	0.00	0.01	0.28	0.00	0.00	0.39	0.73	-0.01	0.35	0.92	0.00
Avail Cap(c_a), veh/h	712	0	583	671	0	0	279	798	676	279	798	676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.4	0.0	21.8	23.8	0.0	0.0	28.3	13.5	0.0	29.2	16.3	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.2	0.0	0.0	0.9	3.6	0.0	1.1	15.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.2	0.0	0.0	0.6	6.1	0.0	0.4	10.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	0.0	21.8	24.0	0.0	0.0	29.2	17.1	0.0	30.3	31.4	0.0
LnGrp LOS	C	A	C	C	A	A	C	B	A	C	C	A
Approach Vol, veh/h		46			90			604			710	
Approach Delay, s/veh		22.4			24.0			18.0			31.4	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	7.7	36.9	18.2	6.4	38.2	18.2
Change Period (Y+Rc), s	3.7	8.8	* 7.7	3.7	8.8	* 7.7
Max Green Setting (Gmax), s	11.0	30.0	* 26	11.0	30.0	* 26
Max Q Clear Time (g_c+I1), s	3.5	26.1	6.4	2.9	19.2	3.4
Green Ext Time (p_c), s	0.0	2.0	0.2	0.0	3.6	0.1

Intersection Summary	
HCM 6th Ctrl Delay	25.1
HCM 6th LOS	C

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln 08/25/2023

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	342	692	775
Demand Flow Rate, veh/h	349	706	791
Vehicles Circulating, veh/h	693	116	158
Vehicles Exiting, veh/h	256	926	664
Ped Vol Crossing Leg, #/h	4	4	4
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	13.5	9.9	12.7
Approach LOS	B	A	B

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	349	706	791
Cap Entry Lane, veh/h	681	1226	1174
Entry HV Adj Factor	0.980	0.981	0.980
Flow Entry, veh/h	342	692	775
Cap Entry, veh/h	667	1201	1151
V/C Ratio	0.513	0.576	0.674
Control Delay, s/veh	13.5	9.9	12.7
LOS	B	A	B
95th %tile Queue, veh	3	4	6

HCM 6th TWSC
5: Murphy Ave & Healdsburg Ave 08/25/2023

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	863	54	22	651	45	111
Future Vol, veh/h	863	54	22	651	45	111
Conflicting Peds, #/hr	0	19	13	0	19	13
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	863	54	22	651	45	111

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	936	0	1623	922
Stage 1	-	-	-	-	909	-
Stage 2	-	-	-	-	714	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	732	-	113	327
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	485	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	720	-	106	318
Mov Cap-2 Maneuver	-	-	-	-	240	-
Stage 1	-	-	-	-	387	-
Stage 2	-	-	-	-	463	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	30.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	291	-	-	720	-
HCM Lane V/C Ratio	0.536	-	-	0.031	-
HCM Control Delay (s)	30.8	-	-	10.2	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	3	-	-	0.1	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St 08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	208	774	0	0	542	216	0	189	0	226	0	146
Future Volume (veh/h)	208	774	0	0	542	216	0	189	0	226	0	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	208	774	0	0	542	81	0	189	0	226	0	17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0	2	0	2
Cap, veh/h	230	893	0	0	592	490	0	347	0	248	0	0
Arrive On Green	0.14	0.53	0.00	0.00	0.35	0.35	0.00	0.21	0.00	0.16	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1385	0	1673	0	1594	226	
Grp Volume(v), veh/h	208	774	0	0	542	81	0	189	0	226	83.6	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1385	0	1673	0	1594	F	
Q Serve(g_s), s	16.7	52.2	0.0	0.0	40.3	5.2	0.0	13.1	0.0	18.2		
Cycle Q Clear(g_c), s	16.7	52.2	0.0	0.0	40.3	5.2	0.0	13.1	0.0	18.2		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	230	893	0	0	592	490	0	347	0	248		
V/C Ratio(X)	0.91	0.87	0.00	0.00	0.92	0.17	0.00	0.55	0.00	0.91		
Avail Cap(c_a), veh/h	248	992	0	0	671	555	0	347	0	273		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	54.9	26.3	0.0	0.0	40.2	28.9	0.0	46.2	0.0	54.1		
Incr Delay (d2), s/veh	30.6	7.6	0.0	0.0	16.9	0.2	0.0	3.1	0.0	29.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	8.7	22.0	0.0	0.0	19.4	1.8	0.0	5.8	0.0	9.4		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.4	33.9	0.0	0.0	57.1	29.1	0.0	49.3	0.0	83.6		
LnGrp LOS	F	C	A	A	E	C	A	D	A	F		
Approach Vol, veh/h		982			623			189				
Approach Delay, s/veh		44.8			53.5			49.3				
Approach LOS		D			D			D				

Timer - Assigned Phs		2			5	6	7	8
Phs Duration (G+Y+Rc), s		75.3			23.5	51.8	24.9	30.0
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0
Max Green Setting (Gmax), s		77.2			* 20	52.2	* 22	27.0
Max Q Clear Time (g_c+I1), s		54.2			18.7	42.3	20.2	15.1
Green Ext Time (p_c), s		6.0			0.1	3.7	0.1	1.3

Intersection Summary	
HCM 6th Ctrl Delay	52.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	233	74	223	138	303	54	502	218	321	631	41
Future Volume (veh/h)	50	233	74	223	138	303	54	502	218	321	631	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	271	76	259	160	50	63	584	244	373	734	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	206	58	212	393	590	101	416	174	289	763	47
Arrive On Green	0.06	0.16	0.16	0.13	0.23	0.23	0.06	0.37	0.37	0.18	0.49	0.49
Sat Flow, veh/h	1594	1257	353	1594	1673	1418	1594	1120	468	1594	1561	96
Grp Volume(v), veh/h	58	0	347	259	160	50	63	0	828	373	0	779
Grp Sat Flow(s),veh/h/ln	1594	0	1610	1594	1673	1418	1594	0	1588	1594	0	1656
Q Serve(g_s), s	5.1	0.0	23.8	19.3	11.7	3.1	5.6	0.0	53.8	26.3	0.0	65.8
Cycle Q Clear(g_c), s	5.1	0.0	23.8	19.3	11.7	3.1	5.6	0.0	53.8	26.3	0.0	65.8
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.29	1.00		0.06
Lane Grp Cap(c), veh/h	99	0	264	212	393	590	101	0	589	289	0	810
V/C Ratio(X)	0.58	0.00	1.31	1.22	0.41	0.08	0.62	0.00	1.41	1.29	0.00	0.96
Avail Cap(c_a), veh/h	146	0	264	212	393	590	131	0	589	289	0	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.2	0.0	60.6	62.8	46.9	25.6	66.2	0.0	45.6	59.3	0.0	35.8
Incr Delay (d2), s/veh	2.0	0.0	165.2	134.2	1.0	0.1	2.3	0.0	192.5	154.1	0.0	22.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	21.6	15.6	5.0	1.1	2.3	0.0	51.9	22.7	0.0	30.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.2	0.0	225.8	197.0	47.9	25.7	68.5	0.0	238.1	213.4	0.0	58.6
LnGrp LOS	E	A	F	F	D	C	E	A	F	F	A	E
Approach Vol, veh/h		405			469			891			1152	
Approach Delay, s/veh		203.3			127.9			226.1			108.7	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.9	77.1	24.0	30.0	31.0	60.0	13.7	40.3
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 12	68.2	* 19	23.8	* 26	53.8	* 13	29.8
Max Q Clear Time (g_c+I1), s	7.6	67.8	21.3	25.8	28.3	55.8	7.1	13.7
Green Ext Time (p_c), s	0.0	0.2	0.0	0.0	0.0	0.0	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	160.8
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	233	74	223	138	303	54	502	218	321	631	41
Future Volume (veh/h)	50	233	74	223	138	303	54	502	218	321	631	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	271	76	259	160	50	63	584	244	373	734	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	229	194	212	347	551	101	446	187	289	806	49
Arrive On Green	0.06	0.14	0.14	0.13	0.21	0.21	0.06	0.40	0.40	0.18	0.52	0.52
Sat Flow, veh/h	1594	1673	1418	1594	1673	1418	1594	1120	468	1594	1561	96
Grp Volume(v), veh/h	58	271	76	259	160	50	63	0	828	373	0	779
Grp Sat Flow(s),veh/h/ln	1594	1673	1418	1594	1673	1418	1594	0	1588	1594	0	1656
Q Serve(g_s), s	5.1	19.8	7.1	19.3	12.2	3.2	5.6	0.0	57.8	26.3	0.0	62.3
Cycle Q Clear(g_c), s	5.1	19.8	7.1	19.3	12.2	3.2	5.6	0.0	57.8	26.3	0.0	62.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.29	1.00		0.06
Lane Grp Cap(c), veh/h	99	229	194	212	347	551	101	0	633	289	0	855
V/C Ratio(X)	0.58	1.19	0.39	1.22	0.46	0.09	0.62	0.00	1.31	1.29	0.00	0.91
Avail Cap(c_a), veh/h	129	229	194	212	347	551	126	0	633	289	0	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.2	62.6	57.1	62.8	50.4	28.1	66.2	0.0	43.6	59.3	0.0	32.0
Incr Delay (d2), s/veh	2.0	119.0	1.8	134.2	1.4	0.1	2.3	0.0	149.8	154.1	0.0	14.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	15.7	2.6	15.6	5.2	1.1	2.3	0.0	48.1	22.7	0.0	26.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.2	181.6	58.9	197.0	51.7	28.2	68.5	0.0	193.4	213.4	0.0	46.0
LnGrp LOS	E	F	E	F	D	C	E	A	F	F	A	D
Approach Vol, veh/h		405			469			891			1152	
Approach Delay, s/veh		142.3			129.4			184.6			100.2	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.9	81.1	24.0	26.0	31.0	64.0	13.7	36.3
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 12	72.6	* 19	19.8	* 26	57.8	* 12	27.4
Max Q Clear Time (g_c+I1), s	7.6	64.3	21.3	21.8	28.3	59.8	7.1	14.2
Green Ext Time (p_c), s	0.0	4.1	0.0	0.0	0.0	0.0	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	136.5
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Intersection				
Intersection Delay, s/veh	180.7			
Intersection LOS	F			

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	415	771	900	1155
Demand Flow Rate, veh/h	423	786	918	1178
Vehicles Circulating, veh/h	1393	719	715	491
Vehicles Exiting, veh/h	276	914	1101	1014
Ped Vol Crossing Leg, #/h	0	2	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	176.4	121.1	199.4	207.3
Approach LOS	F	F	F	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	423	786	918	1178
Cap Entry Lane, veh/h	333	663	665	836
Entry HV Adj Factor	0.980	0.981	0.981	0.981
Flow Entry, veh/h	415	771	900	1155
Cap Entry, veh/h	327	650	653	820
V/C Ratio	1.269	1.186	1.379	1.409
Control Delay, s/veh	176.4	121.1	199.4	207.3
LOS	F	F	F	F
95th %tile Queue, veh	19	26	40	50

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	196	106	228	214	302	123	670	195	330	648	46
Future Volume (veh/h)	87	196	106	228	214	302	123	670	195	330	648	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	87	196	93	228	214	104	123	670	189	330	648	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	55	125	59	173	162	290	126	431	122	226	634	41
Arrive On Green	0.15	0.15	0.15	0.21	0.21	0.21	0.08	0.35	0.35	0.14	0.41	0.41
Sat Flow, veh/h	364	820	389	842	790	1415	1594	1248	352	1594	1554	101
Grp Volume(v), veh/h	376	0	0	442	0	104	123	0	859	330	0	690
Grp Sat Flow(s),veh/h/ln	1572	0	0	1631	0	1415	1594	0	1600	1594	0	1655
Q Serve(g_s), s	22.8	0.0	0.0	30.8	0.0	9.5	11.5	0.0	51.8	21.3	0.0	61.2
Cycle Q Clear(g_c), s	22.8	0.0	0.0	30.8	0.0	9.5	11.5	0.0	51.8	21.3	0.0	61.2
Prop In Lane	0.23		0.25	0.52		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	239	0	0	335	0	290	126	0	553	226	0	675
V/C Ratio(X)	1.57	0.00	0.00	1.32	0.00	0.36	0.97	0.00	1.55	1.46	0.00	1.02
Avail Cap(c_a), veh/h	239	0	0	335	0	290	126	0	553	226	0	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.6	0.0	0.0	59.6	0.0	51.1	68.9	0.0	49.1	64.3	0.0	44.4
Incr Delay (d2), s/veh	277.2	0.0	0.0	163.3	0.0	1.1	71.1	0.0	258.4	228.9	0.0	40.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.3	0.0	0.0	27.7	0.0	3.4	7.1	0.0	59.7	22.9	0.0	31.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	340.8	0.0	0.0	222.9	0.0	52.2	139.9	0.0	307.5	293.3	0.0	84.6
LnGrp LOS	F	A	A	F	A	D	F	A	F	F	A	F
Approach Vol, veh/h		376			546			982			1020	
Approach Delay, s/veh		340.8			190.4			286.5			152.1	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.6	67.4		29.0	26.0	58.0		37.0
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2
Max Green Setting (Gmax), s	* 12	61.2		22.8	* 21	51.8		30.8
Max Q Clear Time (g_c+I1), s	13.5	63.2		24.8	23.3	53.8		32.8
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	228.7
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd
08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	12	89	81	6	40	80	728	33	12	697	176
Future Volume (veh/h)	111	12	89	81	6	40	80	728	33	12	697	176
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	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			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	111	12	3	81	6	29	80	728	27	12	697	164
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	128	32	156	24	116	134	1021	846	45	723	170
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.08	0.61	0.61	0.03	0.55	0.55
Sat Flow, veh/h	1594	1292	323	1594	245	1182	1594	1673	1386	1594	1304	307
Grp Volume(v), veh/h	111	0	15	81	0	35	80	728	27	12	0	861
Grp Sat Flow(s),veh/h/ln	1594	0	1615	1594	0	1427	1594	1673	1386	1594	0	1611
Q Serve(g_s), s	7.3	0.0	0.9	5.2	0.0	2.5	5.3	32.6	0.8	0.8	0.0	55.6
Cycle Q Clear(g_c), s	7.3	0.0	0.9	5.2	0.0	2.5	5.3	32.6	0.8	0.8	0.0	55.6
Prop In Lane	1.00		0.20	1.00		0.83	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	158	0	160	156	0	140	134	1021	846	45	0	893
V/C Ratio(X)	0.70	0.00	0.09	0.52	0.00	0.25	0.60	0.71	0.03	0.27	0.00	0.96
Avail Cap(c_a), veh/h	163	0	165	279	0	249	150	1021	846	147	0	916
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.4	0.0	44.5	46.6	0.0	45.3	48.0	14.6	8.4	51.7	0.0	23.2
Incr Delay (d2), s/veh	10.4	0.0	0.1	1.0	0.0	0.3	2.9	2.6	0.0	1.2	0.0	21.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.4	2.1	0.0	0.9	2.1	11.3	0.2	0.3	0.0	23.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	0.0	44.6	47.5	0.0	45.6	50.9	17.2	8.4	52.9	0.0	44.6
LnGrp LOS	E	A	D	D	A	D	D	B	A	D	A	D
Approach Vol, veh/h		126			116			835			873	
Approach Delay, s/veh		56.3			47.0			20.1			44.7	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.8	66.0		14.4	6.7	72.1		15.5
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7
Max Green Setting (Gmax), s	10.2	61.8		19.0	10.0	62.0		11.1
Max Q Clear Time (g_c+I1), s	7.3	57.6		7.2	2.8	34.6		9.3
Green Ext Time (p_c), s	0.0	2.6		0.2	0.0	7.6		0.0

Intersection Summary		
HCM 6th Ctrl Delay		35.1
HCM 6th LOS		D

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave
08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	22	105	32	14	16	87	708	34	19	836	59
Future Volume (veh/h)	84	22	105	32	14	16	87	708	34	19	836	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.97	0.98		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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	84	22	28	32	14	-9	87	708	0	19	836	-6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	248	55	218	319	142	0	130	956	810	54	876	742
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.00	0.08	0.57	0.00	0.03	0.52	0.00
Sat Flow, veh/h	1088	350	1382	712	362	-210	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	106	0	28	0	0	0	87	708	0	19	836	-6
Grp Sat Flow(s),veh/h/ln	1438	0	1382	0	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	5.1	0.0	1.5	0.0	0.0	0.0	4.5	26.8	0.0	1.0	40.6	0.0
Cycle Q Clear(g_c), s	5.7	0.0	1.5	0.0	0.0	0.0	4.5	26.8	0.0	1.0	40.6	0.0
Prop In Lane	0.79		1.00	0.86		-0.24	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	303	0	218	0	0	0	130	956	810	54	876	742
V/C Ratio(X)	0.35	0.00	0.13	0.00	0.00	0.00	0.67	0.74	0.00	0.35	0.95	-0.01
Avail Cap(c_a), veh/h	513	0	421	0	0	0	149	956	810	149	899	762
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.6	0.0	30.9	0.0	0.0	0.0	38.0	13.6	0.0	40.3	19.4	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.1	0.0	0.0	0.0	6.1	3.4	0.0	1.4	19.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.5	0.0	0.0	0.0	1.9	9.5	0.0	0.4	18.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.8	0.0	31.0	0.0	0.0	0.0	44.2	16.9	0.0	41.7	39.2	0.0
LnGrp LOS	C	A	C	A	A	A	D	B	A	D	D	A
Approach Vol, veh/h		134			0			795			849	
Approach Delay, s/veh		32.4			0.0			19.9			39.5	
Approach LOS		C						B			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.7	53.4		21.2	6.6	57.5		21.2
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7
Max Green Setting (Gmax), s	8.0	45.8		* 26	8.0	45.8		* 26
Max Q Clear Time (g_c+I1), s	6.5	42.6		0.0	3.0	28.8		7.7
Green Ext Time (p_c), s	0.0	2.0		0.0	0.0	6.1		0.4

Intersection Summary		
HCM 6th Ctrl Delay		30.2
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln 08/25/2023

Intersection			
Intersection Delay, s/veh	23.9		
Intersection LOS	C		

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	248	1053	1011
Demand Flow Rate, veh/h	253	1074	1031
Vehicles Circulating, veh/h	859	88	194
Vehicles Exiting, veh/h	366	1024	968
Ped Vol Crossing Leg, #/h	4	4	4
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	13.5	21.0	29.4
Approach LOS	B	C	D

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	253	1074	1031
Cap Entry Lane, veh/h	575	1261	1132
Entry HV Adj Factor	0.980	0.980	0.981
Flow Entry, veh/h	248	1053	1011
Cap Entry, veh/h	563	1236	1110
V/C Ratio	0.441	0.852	0.911
Control Delay, s/veh	13.5	21.0	29.4
LOS	B	C	D
95th %tile Queue, veh	2	11	14

HCM 6th TWSC
5: Murphy Ave & Healdsburg Ave 08/25/2023

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	976	39	53	1015	35	62
Future Vol, veh/h	976	39	53	1015	35	62
Conflicting Peds, #/hr	0	27	19	0	27	19
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	976	39	53	1015	35	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1042	0	2171	1042
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	1148	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	667	-	51	279
Stage 1	-	-	-	-	347	-
Stage 2	-	-	-	-	302	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	652	-	45	268
Mov Cap-2 Maneuver	-	-	-	-	158	-
Stage 1	-	-	-	-	339	-
Stage 2	-	-	-	-	271	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	35.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	214	-	-	652	-
HCM Lane V/C Ratio	0.453	-	-	0.081	-
HCM Control Delay (s)	35.1	-	-	11	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	2.2	-	-	0.3	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	857	0	0	911	120	0	109	0	183	0	139
Future Volume (veh/h)	96	857	0	0	911	120	0	109	0	183	0	139
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	96	857	0	0	911	14	0	109	0	183	0	-5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0	2	0	2
Cap, veh/h	99	1031	0	0	874	725	0	299	0	184	0	0
Arrive On Green	0.06	0.62	0.00	0.00	0.52	0.52	0.00	0.18	0.00	0.12	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1388	0	1673	0	1594	183	
Grp Volume(v), veh/h	96	857	0	0	911	14	0	109	0	183	130.4	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1388	0	1673	0	1594	F	
Q Serve(g_s), s	9.0	60.4	0.0	0.0	78.2	0.7	0.0	8.6	0.0	17.2		
Cycle Q Clear(g_c), s	9.0	60.4	0.0	0.0	78.2	0.7	0.0	8.6	0.0	17.2		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	99	1031	0	0	874	725	0	299	0	184		
V/C Ratio(X)	0.97	0.83	0.00	0.00	1.04	0.02	0.00	0.37	0.00	0.99		
Avail Cap(c_a), veh/h	99	1031	0	0	874	725	0	302	0	184		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	70.1	22.6	0.0	0.0	35.8	17.3	0.0	54.0	0.0	66.1		
Incr Delay (d2), s/veh	80.0	5.9	0.0	0.0	42.0	0.0	0.0	1.6	0.0	64.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.9	24.7	0.0	0.0	41.7	0.2	0.0	3.8	0.0	10.3		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	150.0	28.5	0.0	0.0	77.7	17.3	0.0	55.6	0.0	130.4		
LnGrp LOS	F	C	A	A	F	B	A	E	A	F		
Approach Vol, veh/h		953			925			109				
Approach Delay, s/veh		40.8			76.8			55.6				
Approach LOS		D			E			E				
Timer - Assigned Phs		2			5	6	7	8				
Phs Duration (G+Y+Rc), s		98.0			14.0	84.0	22.0	29.7				
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0				
Max Green Setting (Gmax), s		92.2			* 9.3	78.2	* 17	27.0				
Max Q Clear Time (g_c+I1), s		62.4			11.0	80.2	19.2	10.6				
Green Ext Time (p_c), s		7.6			0.0	0.0	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			64.4									
HCM 6th LOS			E									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	196	106	228	214	302	123	670	195	330	648	46
Future Volume (veh/h)	87	196	106	228	214	302	123	670	195	330	648	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	87	196	93	228	214	104	123	670	189	330	648	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	152	72	190	328	515	142	523	148	267	773	50
Arrive On Green	0.07	0.14	0.14	0.12	0.20	0.20	0.09	0.42	0.42	0.17	0.50	0.50
Sat Flow, veh/h	1594	1062	504	1594	1673	1415	1594	1248	352	1594	1554	101
Grp Volume(v), veh/h	87	0	289	228	214	104	123	0	859	330	0	690
Grp Sat Flow(s),veh/h/ln	1594	0	1566	1594	1673	1415	1594	0	1600	1594	0	1655
Q Serve(g_s), s	7.8	0.0	20.8	17.3	17.1	7.3	11.0	0.0	60.8	24.3	0.0	52.1
Cycle Q Clear(g_c), s	7.8	0.0	20.8	17.3	17.1	7.3	11.0	0.0	60.8	24.3	0.0	52.1
Prop In Lane	1.00		0.32	1.00		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	107	0	225	190	328	515	142	0	671	267	0	824
V/C Ratio(X)	0.82	0.00	1.29	1.20	0.65	0.20	0.86	0.00	1.28	1.24	0.00	0.84
Avail Cap(c_a), veh/h	137	0	225	190	328	515	148	0	671	267	0	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.8	0.0	62.1	63.8	53.8	31.7	65.1	0.0	42.1	60.3	0.0	31.4
Incr Delay (d2), s/veh	19.7	0.0	158.3	129.1	5.2	0.3	35.0	0.0	137.3	133.9	0.0	7.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	17.9	13.8	7.6	2.5	5.8	0.0	48.5	19.6	0.0	21.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.5	0.0	220.4	193.0	58.9	32.0	100.1	0.0	179.4	194.3	0.0	39.3
LnGrp LOS	F	A	F	F	E	C	F	A	F	F	A	D
Approach Vol, veh/h		376			546			982			1020	
Approach Delay, s/veh		189.4			109.8			169.5			89.4	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.7	78.3	22.0	27.0	29.0	67.0	14.4	34.6				
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2				
Max Green Setting (Gmax), s	* 14	71.6	* 17	20.8	* 24	60.8	* 13	25.6				
Max Q Clear Time (g_c+I1), s	13.0	54.1	19.3	22.8	26.3	62.8	9.8	19.1				
Green Ext Time (p_c), s	0.0	5.7	0.0	0.0	0.0	0.0	0.0	1.1				
Intersection Summary												
HCM 6th Ctrl Delay			133.0									
HCM 6th LOS			F									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd
08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	196	106	228	214	302	123	670	195	330	648	46
Future Volume (veh/h)	87	196	106	228	214	302	123	670	195	330	648	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	87	196	93	228	214	104	123	670	189	330	648	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	193	158	190	280	484	143	550	155	278	817	53
Arrive On Green	0.07	0.12	0.12	0.12	0.17	0.17	0.09	0.44	0.44	0.17	0.53	0.53
Sat Flow, veh/h	1594	1673	1376	1594	1673	1414	1594	1248	352	1594	1554	101
Grp Volume(v), veh/h	87	196	93	228	214	104	123	0	859	330	0	690
Grp Sat Flow(s),veh/h/ln	1594	1673	1376	1594	1673	1414	1594	0	1600	1594	0	1655
Q Serve(g_s), s	7.8	16.7	9.3	17.3	17.7	7.6	11.0	0.0	63.9	25.3	0.0	49.2
Cycle Q Clear(g_c), s	7.8	16.7	9.3	17.3	17.7	7.6	11.0	0.0	63.9	25.3	0.0	49.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	107	193	158	190	280	484	143	0	705	278	0	870
V/C Ratio(X)	0.82	1.02	0.59	1.20	0.76	0.21	0.86	0.00	1.22	1.19	0.00	0.79
Avail Cap(c_a), veh/h	110	193	158	190	280	484	170	0	705	278	0	870
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.8	64.2	60.9	63.8	57.6	33.9	65.1	0.0	40.6	59.8	0.0	28.0
Incr Delay (d2), s/veh	33.0	69.3	6.7	129.1	12.4	0.3	26.9	0.0	110.7	114.3	0.0	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	10.6	3.5	13.8	8.4	2.6	5.5	0.0	45.6	18.8	0.0	19.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.8	133.4	67.5	193.0	70.0	34.2	92.0	0.0	151.3	174.1	0.0	33.3
LnGrp LOS	F	F	E	F	E	C	F	A	F	F	A	C
Approach Vol, veh/h		376			546			982			1020	
Approach Delay, s/veh		109.4			114.5			143.9			78.9	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.7	82.4	22.0	22.9	30.0	70.1	14.4	30.5
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 16	73.7	* 17	16.7	* 25	63.9	* 10	24.0
Max Q Clear Time (g_c+I1), s	13.0	51.2	19.3	18.7	27.3	65.9	9.8	19.7
Green Ext Time (p_c), s	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	111.3
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd
08/29/2023

Intersection	
Intersection Delay, s/veh	181.7
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	389	744	988	1024
Demand Flow Rate, veh/h	397	759	1007	1045
Vehicles Circulating, veh/h	1231	897	626	576
Vehicles Exiting, veh/h	390	736	1002	1080
Ped Vol Crossing Leg, #/h	1	2	0	1
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	81.7	201.2	198.5	189.5
Approach LOS	F	F	F	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	397	759	1007	1045
Cap Entry Lane, veh/h	393	553	729	767
Entry HV Adj Factor	0.980	0.980	0.981	0.980
Flow Entry, veh/h	389	744	988	1024
Cap Entry, veh/h	385	542	715	751
V/C Ratio	1.010	1.373	1.382	1.363
Control Delay, s/veh	81.7	201.2	198.5	189.5
LOS	F	F	F	F
95th %tile Queue, veh	12	34	43	43

Appendix H

Stormwater and Drainage Reports

Preliminary Drainage Analysis

For

The Canopy

1009 and 1011 Gravenstein Highway North
Sebastopol, CA
APN 060-261-026 & 028

JN 22181
December 1, 2023

Prepared for:
City Ventures Home Building LLC
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Prepared by:

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Prepared By: MZ
Checked By: AP

Table of Contents

Drainage Narrative

The Canopy
Drainage Narrative

Project Description

The Canopy is located at 1009 and 1011 Gravenstein Highway North in Sebastopol, California (APN 060-261-026 & 028). The two parcels total area is 6.1 acres. This project proposes twenty residential buildings across two parcels with driveways, parking lots, and associated hardscaping and landscaping. The project site has a total of 157,050 square feet (3.6 acres) of new impervious area.

The project site is currently undeveloped with existing grassy vegetation, several trees, and a paved bike pathway (approx. 3200 sf). Existing slopes in the proposed improvements generally vary from 2% to 15%. Current runoff within the parcel on the southeastern portion of the site sheet flows to the northwest. There is a high point on the northwestern portion of the site where runoff sheet flows to the north, west, and south.

The O'Reilly and Associates Office Park (hereon Office Park), designed by Bedford and Associates, is located directly southwest of the project site. Drainage design of this Office Park project included the storm drain system and an onsite detention basin at the northwesterly corner of the site. According to the Drainage Report for the Office Park project, prepared by Bedford and Associates, the detention basin had been sized and was built to maintain the 10-yr post-construction discharge rate (from the Office Park site) to no more than the 10-yr runoff from the site in undeveloped condition.

Methodology

The proposed site improvements include drainage improvements with a storm drain network that collects runoff from the project site and daylight to the existing detention pond. It is proposed to rebuild and repurpose the existing detention pond to also provide bio-retention (treatment) and hydromodification control for the proposed project site. The pond outlet and overflow structures will continue to merge and regulate the combined flows (from the pond and from existing Office Park storm drains) and discharge to off-site outfall at allowable flow rate.

The onsite drainage watershed was divided into multiple drainage areas based on their tributary areas and Incremental Rational Method (SCWA Flood Management Design Manual, FMDM) was used to find the total flow going into the system, refer to the **Post-Construction Hydrology Map** and **10-Year Incremental Rational Method Drainage Study** for proposed stormdrain layout and flow calculations. Weighted runoff coefficients were calculated for each subbasin by approximating the amount of pervious and impervious areas, using Table C-1 Runoff Coefficients from the FMDM. The time of concentration was conservatively assumed to be 7 minutes for each sub-watershed.

According to early project meetings and conversations with City Staffs, the proposed site drainage shall meet similar requirements as the Office Park site where the 10-yr post-construction peak discharge flow to be no more than run-off from the site in undeveloped condition. Since discharges from both sites will be combined prior to being released to off-site outfall, it is reasonable to perform detention analysis for both project sites as a combined watershed.

Detention analyses have been performed using Autodesk SSA with Synthetic Unit Method as outlined by FMDM. A combined watershed of 12 acres of both Office Park site (5.9 acres) and the project site (6.1 acres) was modeled in these analyses (see ***Stormwater Detention Watershed***). Analysis results are summarized in ***Detention Analysis Results*** (details of the analysis model, configuration and input data will be included in Final Drainage Report).

In undeveloped condition, peak runoff from the combined site was calculated as **15.48 cfs** for 10-yr storm events with total runoff volume of 95,024 cu.ft.

For post-construction condition, the rebuilt detention pond and its inlet/outlet and overflow structures have been included in the analysis model. The 12 acres combined developed site generates a total (unmitigated) peak runoff of **29.21 cfs** (14.37+14.84) with a total runoff of 154,119 cu.ft. (75,823+78,296) for 10-yr storm events. The rebuilt detention pond is found sufficiently regulating the peak discharge flow to **15.38 cfs** at the off-site outfall.

Conclusion

The project proposed drainage improvements including bioretention facilities and a storm drain system that connects to the existing storm drain system and detention facility of the neighboring O'Reilly and Associates Office Park. Onsite stormdrain facilities are sized to handle runoff from 10-yr storm events and contain 100-yr flows within the system meeting the FMDM design criteria. Stormwater detention analyses have been performed for the combined watershed of the proposed project site and Office Park site. These analysis results have confirmed that the existing detention facility has sufficient capacity to limit the 10-year peak discharge flow from the combined watershed in postconstruction to no more than runoff from that watershed in preconstruction condition.

Aerial Photo

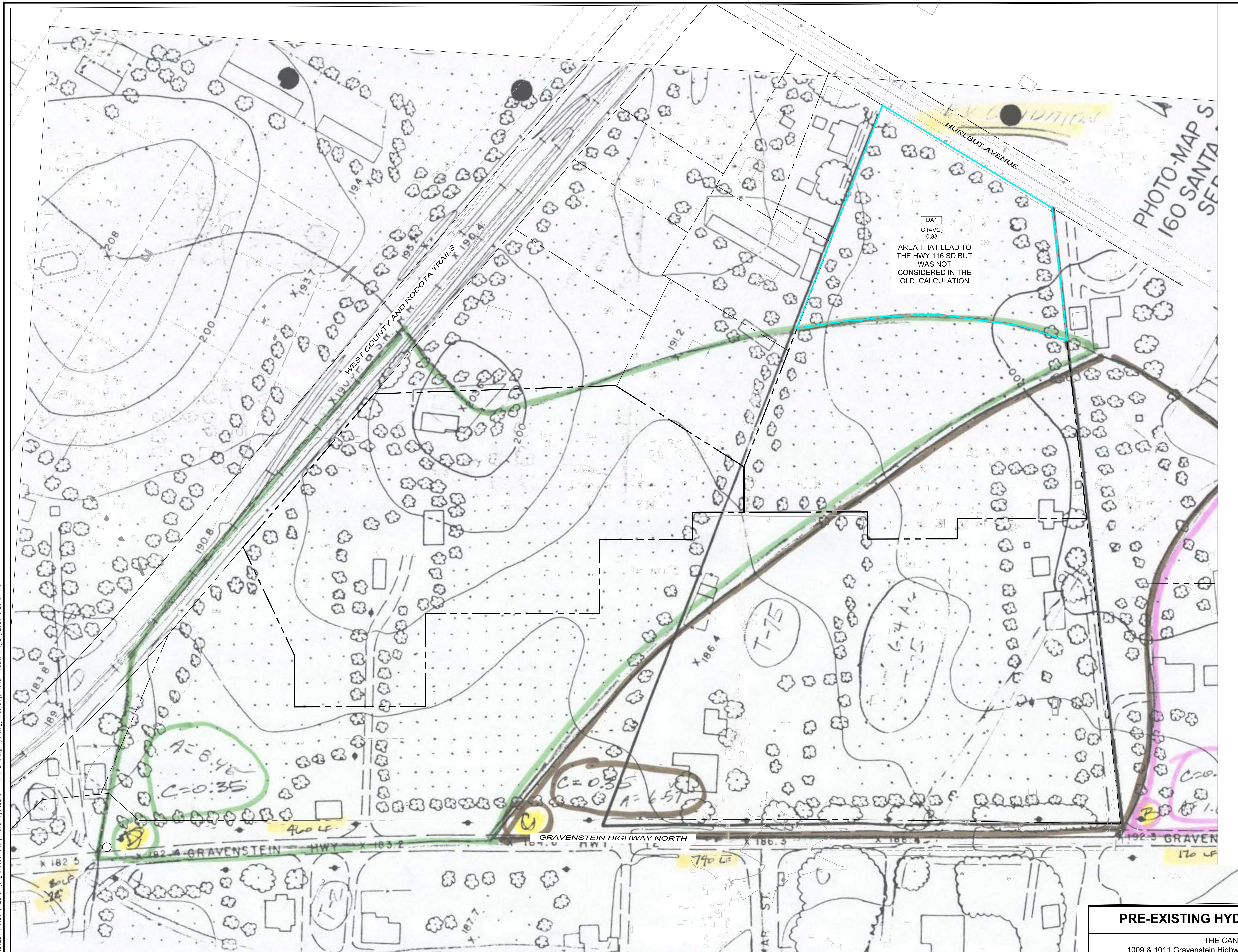

1009 & 1011 Gravenstein Hwy N
APN 060-261-026 & 028
Gravenstein Hwy N
Horse & Plow Tasting Room
Sebastopol Charter School
Holy Ghost Society
1011 Gravenstein Hwy N
E Hurlbut Ave
O'Reilly Media
Hurlbut Ave
Apollo Way
Danmar Dr
Analy Veterinary Hospital
116
Norlee St
Google Earth
1000 ft
N

10 -Year Incremental Rational Method Drainage Study

Pre-Existing Hydrology Map

DRAINAGE AREA TABLE

DA1 = 1.18 AC
(51,250 SF)



50' 25' 0 25' 50' 100' 150'
Graphic Scale: 1" = 50'

January 13, 2023

PRE-EXISTING HYDROLOGY MAP

THE CANOPY
1009 & 1011 Gravenstein Highway North, Sebastapool, CA
APN 060-261-026 & 028

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"A Service You Can Count On!"

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10-Year Storm Event Pre-Existing Conditions

Incremental Rational Method Drainage Study

10 -Yr Storm Event Pre-Existing Condition

Project: 22181-The Canopy **Date:** 1/23/2023

Point of Concentration	Area	Elevation	Distance	Slope	V(ft/s)	Travel Time (min)	Total Time (min)	I	C	A	A_{total}	AC	Sum AC	Q (cfs)	Remarks
10 year															
ON SITE FLOW RATES															
	A 1	-	-	-	-	15.00	15.00	2.44	0.33	1.18	1.18	0.39	0.39	0.95	Additional flow to Hwy 116
								Flow calculated from previous report						9.88	
								Total 10-year flow to existing Hwy 116 system						10.83	Allowed to bypass, without retention

ON SITE - POST CONSTRUCTION RUNOFF COEFFICIENT

AREA	ACRES	C	t (min)			
A 1	1.18	0.33	15.00			

Rainfall Intensity vs Duration

$$I = 10.88 / t^{0.552}$$

I = intensity (in/hour)

t = time of concentration (minutes)

T:\2022 PROJECTS\22181\Reports\Drainage\Preliminary Drainage Report\[22181-PRE EXISTING-Incremental Rational Method (w IDF Curve).xlsx]10_Year Storm

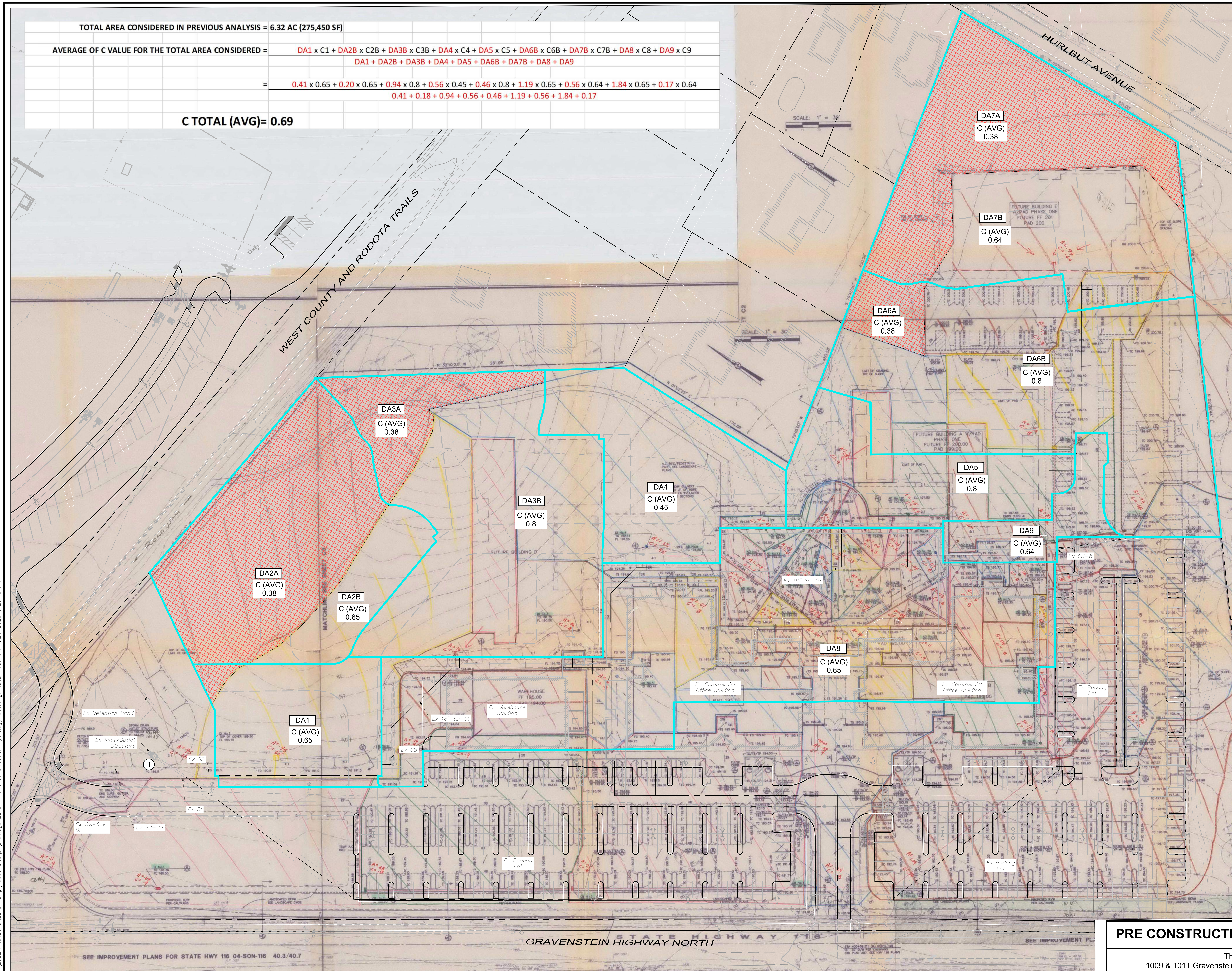
Pre-Construction Hydrology Map

TOTAL AREA CONSIDERED IN PREVIOUS ANALYSIS = 6.32 AC (275,450 SF)

AVERAGE OF C VALUE FOR THE TOTAL AREA CONSIDERED = $\frac{DA1 \times C1 + DA2B \times C2B + DA3B \times C3B + DA4 \times C4 + DA5 \times C5 + DA6B \times C6B + DA7B \times C7B + DA8 \times C8 + DA9 \times C9}{DA1 + DA2B + DA3B + DA4 + DA5 + DA6B + DA7B + DA8 + DA9}$

$= \frac{0.41 \times 0.65 + 0.20 \times 0.65 + 0.94 \times 0.8 + 0.56 \times 0.45 + 0.46 \times 0.8 + 1.19 \times 0.65 + 0.56 \times 0.64 + 1.84 \times 0.65 + 0.17 \times 0.64}{0.41 + 0.18 + 0.94 + 0.56 + 0.46 + 1.19 + 0.56 + 1.84 + 0.17}$

C TOTAL (AVG)= 0.69



DRAINAGE AREA TABLE

DA1 = 0.41 AC (17,774 SF)	DA6A = 0.09 AC (4,000 SF)
DA2A = 0.72 AC (31,338 SF)	DA6B = 1.19 AC (51,952 SF)
DA2B = 0.20 AC (8,617 SF)	DA7A = 0.64 AC (27,905 SF)
DA3A = 0.21 AC (8,940 SF)	DA7B = 0.56 AC (24,199 SF)
DA3B = 0.94 AC (41,015 SF)	DA8 = 1.84 AC (80,256 SF)
DA4 = 0.56 AC (24,246 SF)	DA9 = 0.17 AC (7,546 SF)
DA5 = 0.46 AC (19,845 SF)	

HATCHING LEGEND

AREA NOT INCLUDED IN THE PREVIOUS DRAINAGE ANALYSIS 1.66 AC (72,183 SF)

40' 20' 0 20' 40' 80' 120'

Graphic Scale: 1" = 40'

January 13, 2023

PRE CONSTRUCTION HYDROLOGY MAP

THE CANOPY
1009 & 1011 Gravenstein Highway North, Sebastapool, CA
APN 060-261-026 & 028

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10-Year Storm Event Pre-Construction Conditions

Incremental Rational Method Drainage Study

10 -Yr Storm Event Pre Construction

Project: 22181-The Canopy **Date:** 1/12/2023

Point of Concentration	Area	Elevation	Distance	Slope	V(ft/s)	Travel Time (min)	Total Time (min)	I	C	A	A_{total}	AC	Sum AC	Q (cfs)	Remarks
10 year															
ON SITE FLOW RATES															
	A T	-	-	-	-	7.00	7.00	3.72	0.69	6.32	6.32	4.36	4.36	16.21	Flow to DETENTION POND (Q1)
	A N	-	-	-	-	7.00	7.00	3.72	0.33	1.66	1.66	0.55	0.55	2.04	New Flow to DETENTION POND (Q3)

ON SITE - POST CONSTRUCTION RUNOFF COEFFICIENT

DRAINAGE AREA		ACRES	C	t (min)			
A	T*	6.33	0.69	7.00			
A	N*	1.66	0.33	7.00			

***NOTE**

AT: Total area from Northern portion of existing site to the Detention Pond

AN: Total area from Northern portion of existing site not included in old drainage calulations to the Detention Pond

***Land Use Designation**

HD - High Density
LD - Low Density
MD - Medium Density
MLD - Medium/Low Density
R - Rural
B/C - Business or Commercial
I - Industrial
P - Parks and Recreation
AG - Agricultural or Open Space

Reference Table C-1 of the Sonoma County FMDM, 2020.

Rainfall Intensity vs Duration

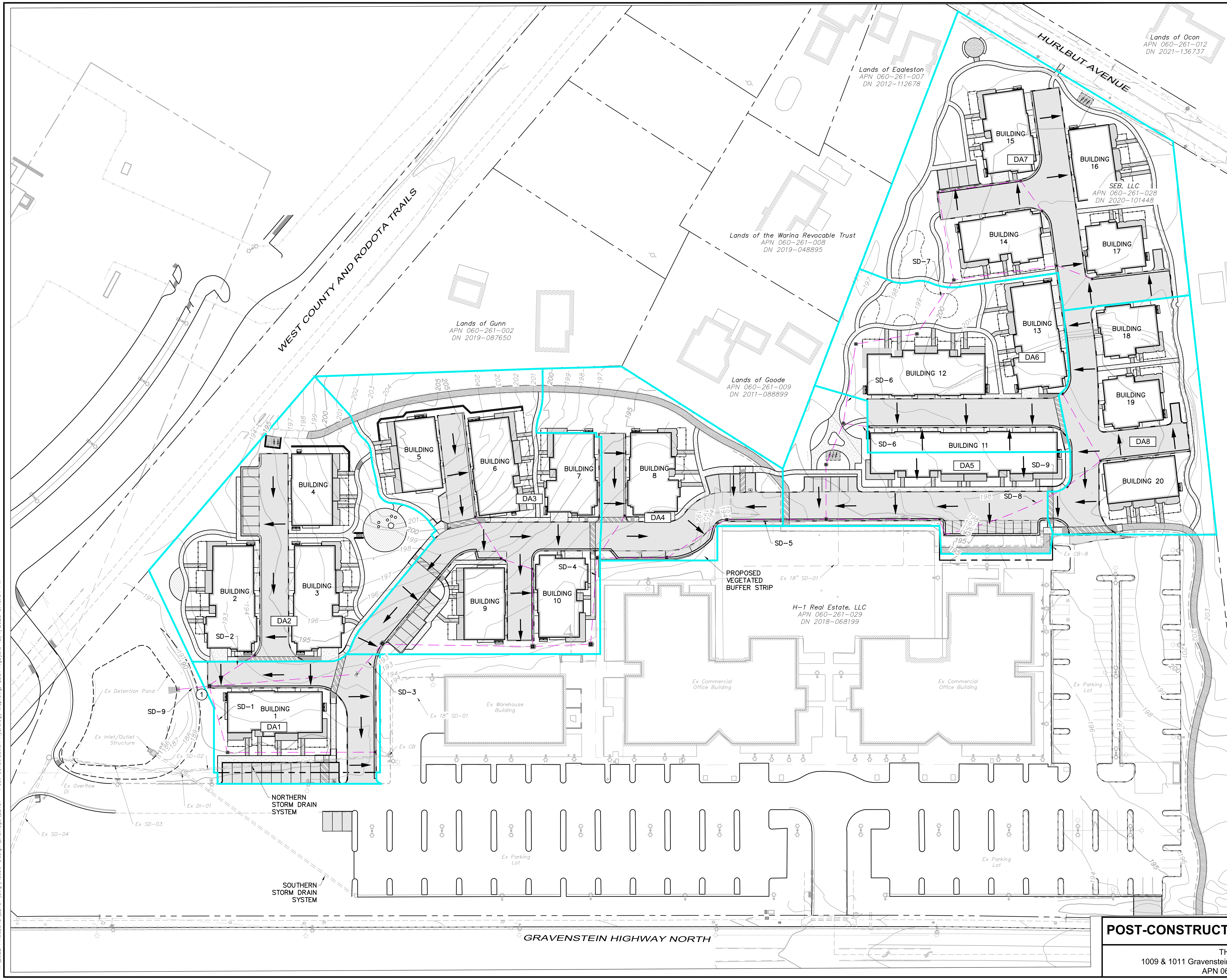
$$I = 10.88 / t^{0.552}$$

I = intensity (in/hour)

t = time of concentration (minutes)

T:\2022 PROJECTS\22181\Reports\Drainage\Preliminary Drainage Report\[22181-PRE EXISTING-Incremental Rational Method (w IDF Curve).xlsx]10_Year Storm

Post-Construction Hydrology Map



DRAINAGE AREA TABLE

DA1 = 0.41 AC (17,774 SF)
DA2 = 0.92 AC (39,955 SF)
DA3 = 1.15 AC (49,955 SF)
DA4 = 0.56 AC (24,246 SF)
DA5 = 0.46 AC (19,845 SF)
DA6 = 1.28 AC (55,952 SF)
DA7 = 1.20 AC (52,104 SF)
DA8 = 0.63 AC (27,565 SF)

DRAINAGE AREA LEGEND

DA1 DRAINAGE AREA
1 POINT OF CONCENTRATION
DRAINAGE AREA BOUNDARY
PROPERTY LINE (℗)
DIRECTION OF FLOW

DRAINAGE ROUTING

DA2 → SD-2 → DI-1; DA3 → SD-3; DA4 → SD-4; DA5 → SD-5; DA6 → SD-6; DA7 → SD-7; SD-7 → SD-6 → SD-5 → SD-4 → SD-3 → DI-1; DA8 → SD-8 → SD-5; DA1 → SD-1 → DI-1; DI-1 → SD-9 → 1

HATCHING LEGEND

ASPHALT PAVING
HARDSCAPE (SLD)
WOOD DECK (SLD)
PAVERS (SLD)
LANDSCAPE/ VEGETATED AREA

40' 20' 0 20' 40' 80' 120'
Graphic Scale: 1" = 40'

December 1, 2023

POST-CONSTRUCTION HYDROLOGY MAP

THE CANOPY
1009 & 1011 Gravenstein Highway North, Sebastapool, CA
APN 060-261-026 & 028

adobe associates, inc.
civil engineering | land surveying | wastewater
1220 N. Dutton Ave., Santa Rosa, CA 95401
P. (707) 541-2300 F. (707) 541-2301
Website: www.adobeinc.com
"A Service You Can Count On!"

T:\2022 PROJECTS\22181\dwg\Adobe-Design\Drainage\22181 - Post Construction Hydrology Map.dwg, Quan Nguyen, 12/1/2023 3:15:04 PM

10-Year Storm Event Post-Construction Conditions

Incremental Rational Method Drainage Study

10 -Yr Storm Event Post Construction

Project: 22181-The Canopy **Date:** 1/12/2023

Point of Concentration	Area	Elevation	Distance	Slope	V(ft/s)	Travel Time (min)	Total Time (min)	I	C	A	A_{total}	AC	Sum AC	Q (cfs)	Remarks
10 year															
ON SITE FLOW RATES															
	A 2	-	-	-	-	7.00	7.00	3.72	0.74	0.92	0.92	0.68	0.68	2.52	Total Flow to SD-2
	A 1	-	-	-	-	7.00	7.00	3.72	0.74	0.41	0.41	0.30	0.30	1.12	Flow to SD-1
								Combines Flow from DA1 and DA2						3.64	Total Flow to SD-1
	A 3	-	-	-	-	7.00	7.00	3.72	0.74	1.15	1.15	0.85	0.85	3.15	Total Flow to SD-3
	A 4	-	-	-	-	7.00	7.00	3.72	0.74	0.56	0.56	0.41	0.41	1.53	Total Flow to SD-4
	A 7	-	-	-	-	7.00	7.00	3.72	0.74	1.20	1.20	0.89	0.89	3.29	Total Flow to SD-8
	A 6	-	-	-	-	7.00	7.00	3.72	0.74	1.28	1.28	0.95	0.95	3.53	Total Flow to SD-7
	A 5	-	-	-	-	7.00	7.00	3.72	0.74	0.46	0.46	0.34	0.34	1.26	Flow to SD-5
								Combines Flow from DA5, DA6, and DA7						8.09	Total Flow to SD-5
	A 9	-	-	-	-	7.00	7.00	3.72	0.74	0.17	0.17	0.13	0.13	0.48	Total Flow to SD-6
	A 8	-	-	-	-	7.00	7.00	3.72	0.74	1.84	1.84	1.36	1.36	5.07	Flow to EX-SD-1
								Combines Flow from DA5, DA6, DA7, DA8, and DA9						18.31	Total Flow to EX-SD-1
1							Combines Flow from DA1, DA2,DA3,DA4,DA5, DA6, DA7, DA8, and DA9							21.96	Total Flow to EX-SD-2

ON SITE - POST CONSTRUCTION RUNOFF COEFFICIENT

DRAINAGE AREA		ACRES	C	t (min)	LAND* USE	SOIL TYPE	AVE SLOPE (%)
A	1	0.41	0.74	7.00	HD	C	>2-6
A	2	0.92	0.74	7.00	MD	C	>2-6
A	3	1.15	0.74	7.00	MD	C	>2-6
A	4	0.56	0.74	7.00	MD	C	>2-6
A	5	0.46	0.74	7.00	MD	C	>2-6
A	6	1.28	0.74	7.00	MD	C	>2-6
A	7	1.20	0.74	7.00	MD	C	>2-6
A	8	1.84	0.74	7.00	MD	C	>2-6
A	9	0.17	0.74	7.00	HD	C	>2-6

***Land Use Designation**

HD - High Density
LD - Low Density
MD - Medium Density
MLD - Medium/Low Density
R - Rural
B/C - Business or Commercial
I - Industrial
P - Parks and Recreation
AG - Agricultural or Open Space

Reference Table C-1 of the Sonoma County FMDM, 2020.

Rainfall Intensity vs Duration

$$I = 10.88 / t^{0.552}$$

I = intensity (in/hour)

t = time of concentration (minutes)

T:\2022 PROJECTS\22181\dwg\Adobe-Design\Drainage\[CALCS.xlsx]Sheet1

Table C-1. Runoff Coefficients (*Cs*) (Incremental Rational Method)

Land Use	Lot Size (acres)	Impervious Fraction	Average Slope (%)			
			0-2	>2-6	>6-12	>12
Soil Type A						
Residential[1]						
Rural		0.03	0.24	0.28	0.34	0.38
Very low density	2	0.11	0.29	0.34	0.38	0.42
	1	0.24	0.38	0.42	0.46	0.49
Low density	1/2	0.32	0.43	0.47	0.50	0.53
	1/3	0.41	0.50	0.53	0.56	0.58
Medium-low density	1/4	0.49	0.55	0.58	0.60	0.62
Medium density	1/8	0.70	0.70	0.71	0.73	0.74
Medium-high density	1/18	1	0.90	0.90	0.90	0.90
Business, commercial, etc.		1	0.90	0.90	0.90	0.90
General industrial		1	0.90	0.90	0.90	0.90
Parks and recreation		0.05	0.25	0.25	0.30	0.35
Ag and open space		0.02	0.23	0.23	0.28	0.33
Soil Type B						
Residential[1]						
Rural		0.03	0.28	0.33	0.39	0.43
Very low density	2	0.11	0.34	0.38	0.43	0.47
	1	0.24	0.42	0.45	0.50	0.53
Low density	1/2	0.32	0.47	0.50	0.54	0.57
	1/3	0.41	0.53	0.56	0.59	0.61
Medium-low density	1/4	0.49	0.58	0.60	0.63	0.65
Medium density	1/8	0.70	0.71	0.73	0.74	0.76
Medium-high density	1/18	1	0.90	0.90	0.90	0.90
Business, commercial, etc.		1	0.90	0.90	0.90	0.90
General industrial		1	0.90	0.90	0.90	0.90
Parks and recreation		0.05	0.25	0.30	0.34	0.40
Ag and open space		0.02	0.23	0.28	0.33	0.38
Soil Type C						
Residential[1]						
Rural		0.03	0.33	0.38	0.43	0.47
Very low density	2	0.11	0.38	0.42	0.47	0.51
	1	0.24	0.45	0.49	0.53	0.57
Low density	1/2	0.32	0.50	0.53	0.57	0.60

Land Use	Lot Size (acres)	Impervious Fraction	Average Slope (%)			
			0-2	>2-6	>6-12	>12
	1/3	0.41	0.56	0.59	0.62	0.64
Medium-low density	1/4	0.49	0.60	0.63	0.65	0.68
Medium density	1/8	0.70	0.73	0.74	0.76	0.77
Medium-high density	1/18	1	0.90	0.90	0.90	0.90
Business, commercial, etc.		1	0.90	0.90	0.90	0.90
General industrial		1	0.90	0.90	0.90	0.90
Parks and recreation		0.05	0.34	0.39	0.44	0.48
Ag and open space		0.02	0.33	0.38	0.43	0.47
Soil Type D						
Residential[1]						
Rural		0.03	0.38	0.43	0.48	0.52
Very low density	2	0.11	0.42	0.47	0.52	0.55
	1	0.24	0.49	0.53	0.57	0.60
Low density	1/2	0.32	0.54	0.57	0.61	0.63
	1/3	0.41	0.59	0.62	0.65	0.67
Medium-low density	1/4	0.49	0.63	0.65	0.68	0.70
Medium density	1/8	0.70	0.74	0.76	0.77	0.78
Medium-high density	1/18	1	0.90	0.90	0.90	0.90
Business, commercial		1	0.90	0.90	0.90	0.90
General industrial		1	0.90	0.90	0.90	0.90
Parks and recreation		0.05	0.39	0.44	0.49	0.53
Ag and open space		0.02	0.38	0.42	0.48	0.52

[1] *Percent impervious values are based on analysis conducted by ESA for Sonoma County Water Agency (Sonoma Water) in 2014, using a sample of existing developed areas.*

[2] *For residential areas, composite* C *values were developed as follows:* C *values for soil type from Los Angeles County Hydrology Manual (1991) were modified for slope using the vegetated areas curve from Plate B-1 of SCWA (1983) for pervious areas within a given slope range and a* C *of 0.90 for all impervious areas.*

Source: Approach adapted from McCuen 1989

NOAA Atlas 14 – Point Precipitation Frequency Estimates & Intensity Duration Frequency Curve (IDF Curve)

Intensity Duration Frequency Curve (IDF Curve)

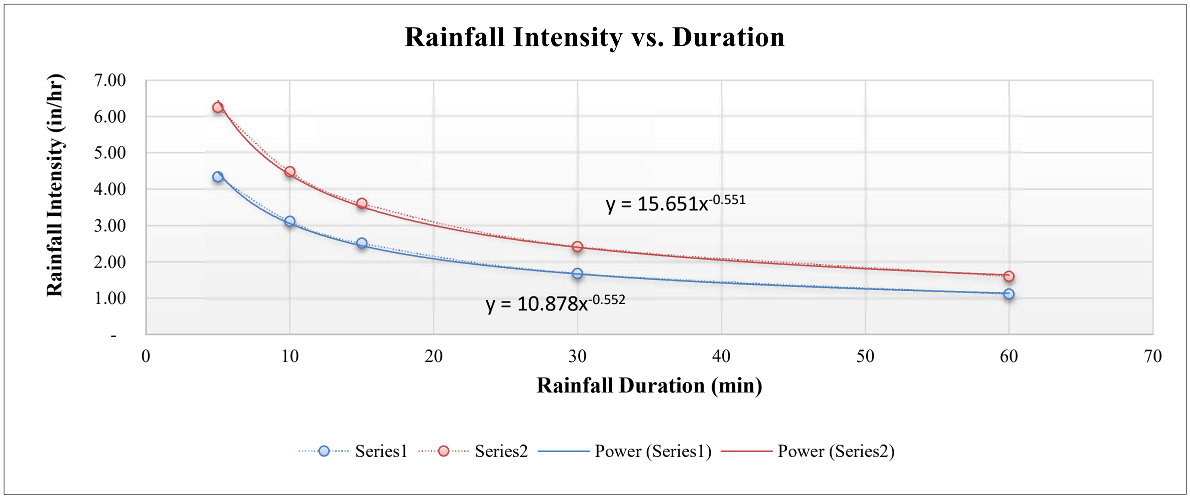
NOAA Atlas 14 Point Precipitation Frequency Estimates

https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html

Project: The Canopy **Date:** 1/19/2023

JN: 22181 **Designer:** AP

Location: Santa Rosa, CA



NOAA Atlas 14 Data Rainfall Intensity (in/hr)		
Duration (min)	**10-yr**	**100-yr**
5	4.34	6.25
10	3.11	4.48
15	2.51	3.61
30	1.68	2.42
60	1.11	1.60

Rainfall Intensity vs Duration

$$I = a * t^{b}$$

I = intensity (in/hour)
t = time of concentration/ rainfall duration (minutes)

10-Year Trendline Values	
a =	10.879
b =	-0.552

100-Year Trendline Values	
a =	15.65
b =	-0.551

T:\2022 PROJECTS\22181\Reports\Drainage\Preliminary Drainage Report\[22181-Incremenatal Rational Method (w IDF Curve).xlsx]IDF Curve

Stormwater Detention Analysis

STORMWATER DETENTION WATERSHED

THE CANOPY
1009 & 1011 Gravenstein Highway North, Sebastapool, CA
APN 060-261-026 & 028

adobe associates, inc.
civil engineering | land surveying | wastewater
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"A Service You Can Count On!"

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Agenda Item Number 3

NOAA Atlas 14, Volume 6, Version 2
Location name: Shaver Lake, California, USA*
Latitude: 37.4°, Longitude: -119.2°
Elevation: 7158 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	**2**	**5**	**10**	**25**	**50**	**100**	**200**	**500**	**1000**
5-min	**0.165** (0.142-0.193)	**0.213** (0.184-0.250)	**0.280** (0.240-0.329)	**0.337** (0.287-0.401)	**0.420** (0.342-0.520)	**0.488** (0.387-0.620)	**0.560** (0.432-0.735)	**0.640** (0.476-0.868)	**0.755** (0.534-1.08)	**0.851** (0.577-1.27)
10-min	**0.237** (0.204-0.277)	**0.306** (0.263-0.358)	**0.401** (0.344-0.472)	**0.483** (0.411-0.574)	**0.602** (0.491-0.746)	**0.699** (0.555-0.889)	**0.803** (0.619-1.05)	**0.917** (0.682-1.24)	**1.08** (0.765-1.54)	**1.22** (0.827-1.82)
15-min	**0.286** (0.247-0.335)	**0.370** (0.318-0.433)	**0.485** (0.417-0.571)	**0.584** (0.497-0.695)	**0.728** (0.593-0.902)	**0.845** (0.671-1.08)	**0.971** (0.748-1.27)	**1.11** (0.825-1.50)	**1.31** (0.926-1.87)	**1.48** (1.00-2.20)
30-min	**0.391** (0.337-0.457)	**0.505** (0.435-0.592)	**0.663** (0.569-0.780)	**0.799** (0.679-0.949)	**0.995** (0.811-1.23)	**1.16** (0.917-1.47)	**1.33** (1.02-1.74)	**1.52** (1.13-2.06)	**1.79** (1.26-2.55)	**2.02** (1.37-3.00)
60-min	**0.509** (0.439-0.596)	**0.658** (0.567-0.771)	**0.863** (0.741-1.02)	**1.04** (0.884-1.24)	**1.30** (1.06-1.60)	**1.50** (1.19-1.91)	**1.73** (1.33-2.27)	**1.97** (1.47-2.68)	**2.33** (1.65-3.33)	**2.62** (1.78-3.91)
2-hr	**0.757** (0.653-0.886)	**0.960** (0.827-1.12)	**1.24** (1.07-1.46)	**1.49** (1.26-1.77)	**1.84** (1.50-2.28)	**2.13** (1.69-2.71)	**2.45** (1.89-3.21)	**2.79** (2.08-3.79)	**3.29** (2.33-4.70)	**3.71** (2.52-5.52)
3-hr	**0.948** (0.818-1.11)	**1.19** (1.03-1.40)	**1.53** (1.32-1.80)	**1.82** (1.55-2.17)	**2.25** (1.84-2.79)	**2.60** (2.07-3.31)	**2.98** (2.30-3.91)	**3.39** (2.52-4.60)	**3.99** (2.82-5.70)	**4.49** (3.05-6.69)
6-hr	**1.41** (1.22-1.65)	**1.76** (1.52-2.06)	**2.24** (1.93-2.64)	**2.66** (2.26-3.16)	**3.26** (2.66-4.04)	**3.76** (2.98-4.78)	**4.29** (3.30-5.62)	**4.86** (3.62-6.60)	**5.70** (4.03-8.14)	**6.40** (4.34-9.52)
12-hr	**2.09** (1.80-2.44)	**2.65** (2.28-3.11)	**3.42** (2.94-4.03)	**4.08** (3.47-4.85)	**5.02** (4.09-6.22)	**5.78** (4.59-7.35)	**6.58** (5.07-8.63)	**7.44** (5.54-10.1)	**8.68** (6.14-12.4)	**9.69** (6.57-14.4)
24-hr	**2.89** (2.57-3.33)	**3.78** (3.36-4.36)	**4.99** (4.42-5.76)	**6.01** (5.28-6.98)	**7.44** (6.36-8.87)	**8.58** (7.22-10.4)	**9.78** (8.06-12.1)	**11.1** (8.91-14.0)	**12.9** (10.0-16.9)	**14.4** (10.9-19.4)
2-day	**3.84** (3.41-4.42)	**5.13** (4.55-5.91)	**6.87** (6.07-7.92)	**8.32** (7.31-9.66)	**10.4** (8.87-12.4)	**12.0** (10.1-14.6)	**13.7** (11.3-17.0)	**15.5** (12.5-19.7)	**18.1** (14.1-23.8)	**20.2** (15.3-27.3)
3-day	**4.42** (3.93-5.09)	**5.97** (5.29-6.87)	**8.04** (7.11-9.27)	**9.78** (8.59-11.4)	**12.2** (10.5-14.6)	**14.2** (11.9-17.2)	**16.2** (13.4-20.1)	**18.4** (14.8-23.3)	**21.5** (16.7-28.1)	**23.9** (18.1-32.3)
4-day	**4.87** (4.32-5.60)	**6.58** (5.83-7.57)	**8.87** (7.85-10.2)	**10.8** (9.49-12.5)	**13.5** (11.5-16.1)	**15.6** (13.1-19.0)	**17.9** (14.7-22.1)	**20.2** (16.3-25.6)	**23.6** (18.4-30.9)	**26.3** (19.9-35.5)
7-day	**5.89** (5.23-6.78)	**7.89** (6.99-9.08)	**10.6** (9.34-12.2)	**12.8** (11.2-14.8)	**15.9** (13.6-19.0)	**18.4** (15.4-22.3)	**20.9** (17.2-25.9)	**23.6** (19.0-29.9)	**27.4** (21.3-35.9)	**30.5** (23.0-41.1)
10-day	**6.67** (5.92-7.68)	**8.88** (7.88-10.2)	**11.8** (10.5-13.6)	**14.3** (12.5-16.6)	**17.7** (15.1-21.1)	**20.3** (17.1-24.7)	**23.1** (19.0-28.6)	**26.0** (20.9-32.9)	**30.1** (23.4-39.4)	**33.3** (25.2-44.9)
20-day	**8.72** (7.74-10.0)	**11.6** (10.3-13.4)	**15.3** (13.6-17.7)	**18.4** (16.2-21.4)	**22.5** (19.3-26.9)	**25.7** (21.6-31.2)	**28.9** (23.9-35.8)	**32.3** (26.0-40.9)	**36.9** (28.7-48.3)	**40.4** (30.6-54.5)
30-day	**10.7** (9.51-12.3)	**14.2** (12.6-16.4)	**18.7** (16.6-21.6)	**22.3** (19.6-25.9)	**27.1** (23.2-32.4)	**30.7** (25.8-37.3)	**34.4** (28.3-42.6)	**38.1** (30.7-48.2)	**43.1** (33.5-56.4)	**46.9** (35.5-63.3)
45-day	**13.4** (11.9-15.4)	**17.7** (15.7-20.3)	**23.0** (20.4-26.6)	**27.3** (24.0-31.7)	**32.8** (28.0-39.1)	**36.8** (31.0-44.7)	**40.9** (33.7-50.6)	**44.9** (36.2-56.9)	**50.2** (39.1-65.8)	**54.2** (41.0-73.1)
60-day	**15.9** (14.1-18.3)	**20.9** (18.5-24.0)	**27.0** (23.9-31.1)	**31.7** (27.9-36.8)	**37.8** (32.3-45.1)	**42.2** (35.5-51.2)	**46.5** (38.3-57.6)	**50.8** (40.9-64.3)	**56.3** (43.8-73.8)	**60.4** (45.7-81.4)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

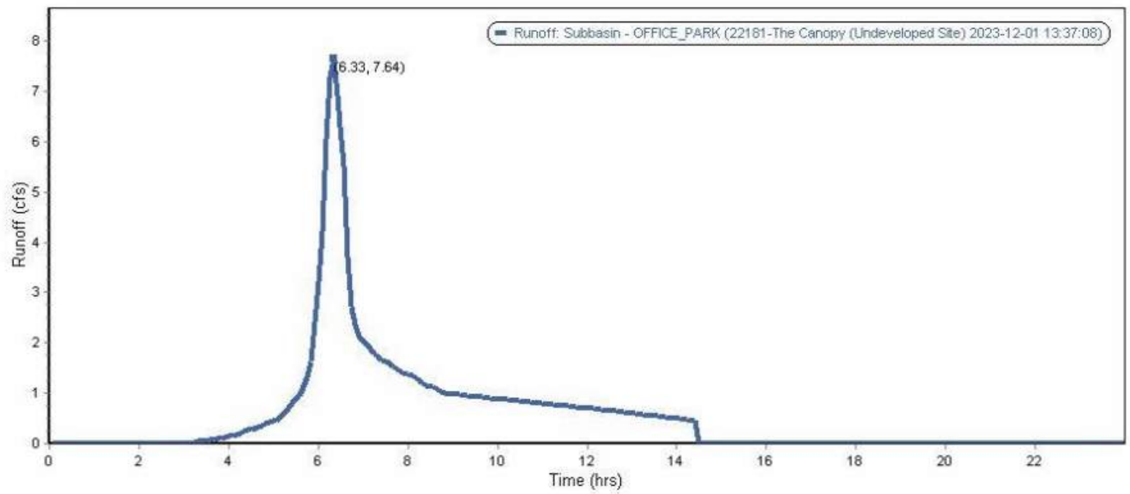
Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

Plan View | Time Series

UNDEVELOPED SITE RUNOFF - OFFICE PARK



Runoff Summary Table

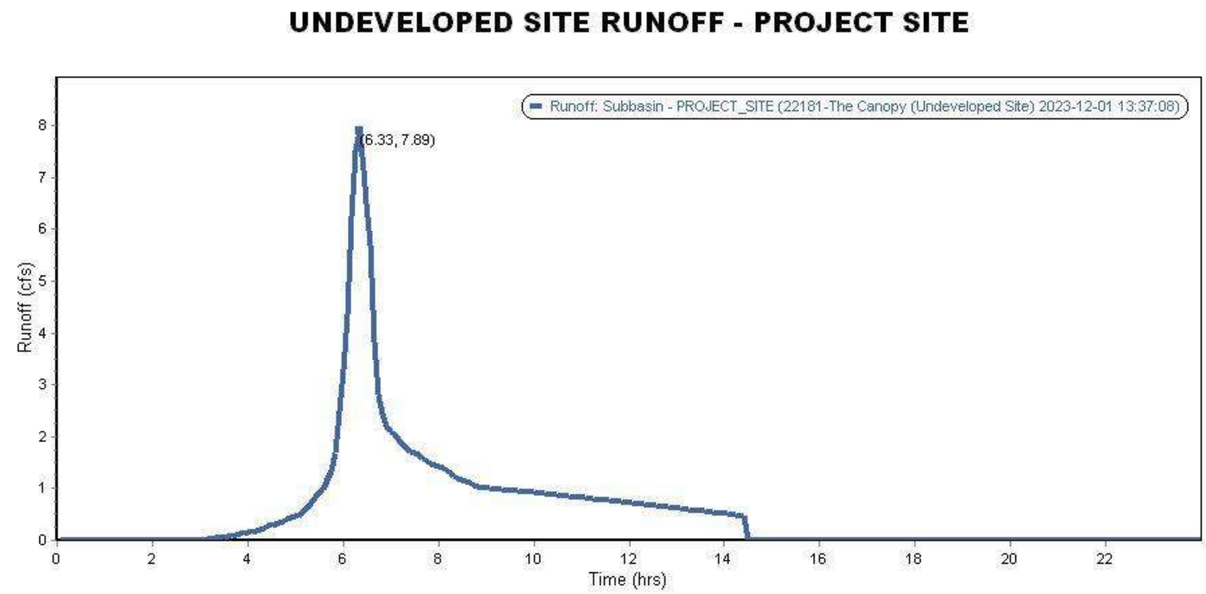
Time period
From: 11/16/2023, 12:00:00 AM
To: 11/17/2023, 12:00:00 AM

Thresholds
Exceedance: 0
Deficit: 0

Detention storage
Max flow: 0

Element ID	OFFICE_PARK
Maximum Runoff (cfs)	7.64
Minimum Runoff (cfs)	0.00
Event Mean Runoff (cfs)	0.54
Duration of Exceedances (hrs)	N/A
Duration of Deficits (hrs)	N/A
Number of Exceedances	N/A
Number of Deficits	N/A
Volume of Exceedance (ft^3)	N/A
Volume of Deficit (ft^3)	N/A
Total Runoff (ft^3)	46746.9
Detention Storage (ft^3)	N/A

Plan View | Time Series



Runoff Summary Table

Time period

From: 11/16/2023, 12:00:00 AM

To: 11/17/2023, 12:00:00 AM

Thresholds

Exceedance: 0

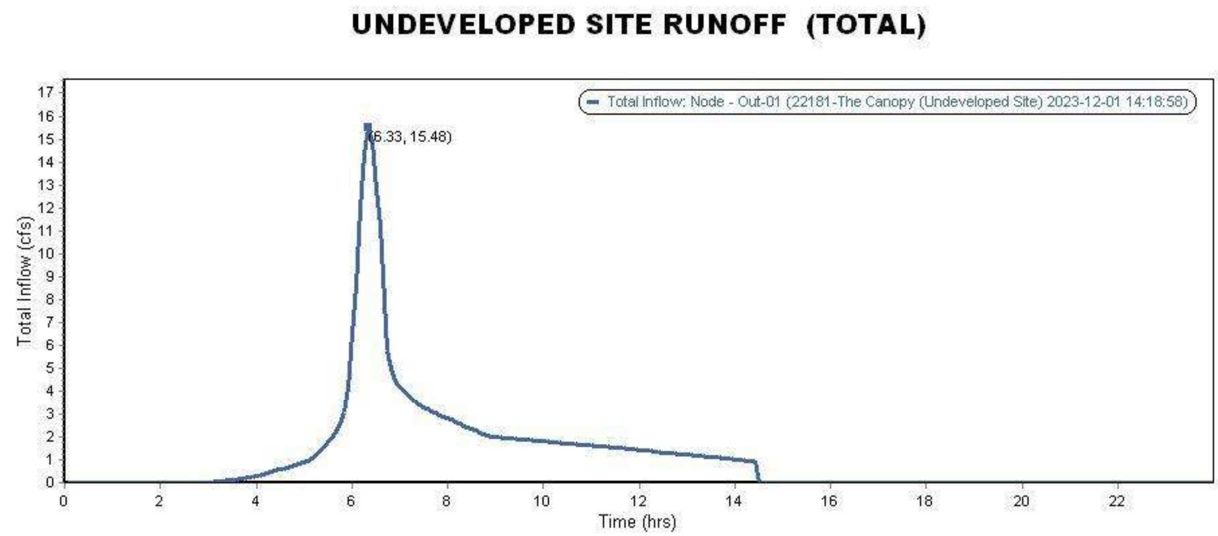
Deficit: 0

Detention storage

Max flow: 0

Element ID	PROJECT_SITE
Maximum Runoff (cfs)	7.89
Minimum Runoff (cfs)	0.00
Event Mean Runoff (cfs)	0.56
Duration of Exceedances (hrs)	N/A
Duration of Deficits (hrs)	N/A
Number of Exceedances	N/A
Number of Deficits	N/A
Volume of Exceedance (ft³)	N/A
Volume of Deficit (ft³)	N/A
Total Runoff (ft³)	48272.7
Detention Storage (ft³)	N/A

Plan View | Time Series



Total Inflow Summary Table

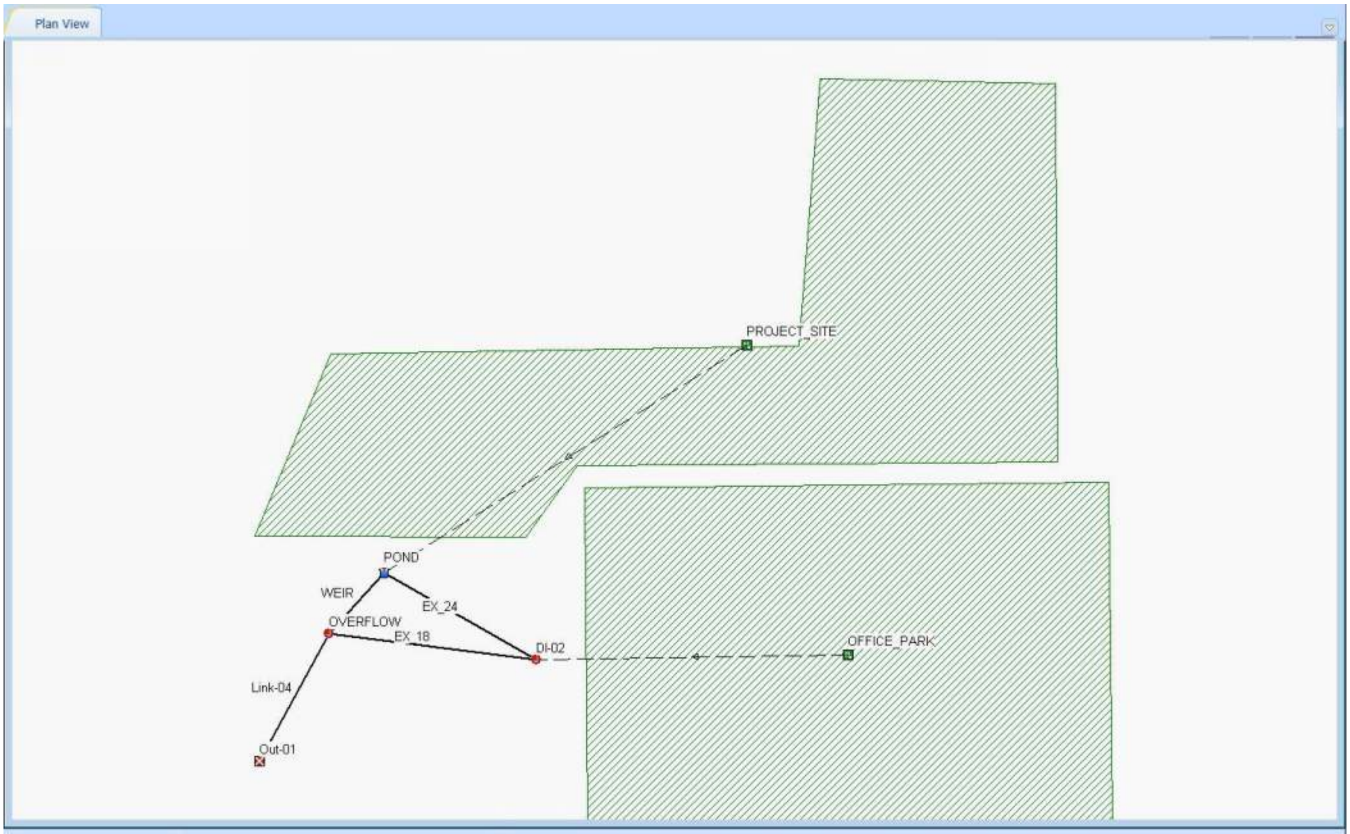
Time period
From: 11/16/2023, 12:00:00 AM
To: 11/17/2023, 12:00:00 AM

Thresholds
Exceedance: 0
Deficit: 0

Detention storage
Max flow: 0

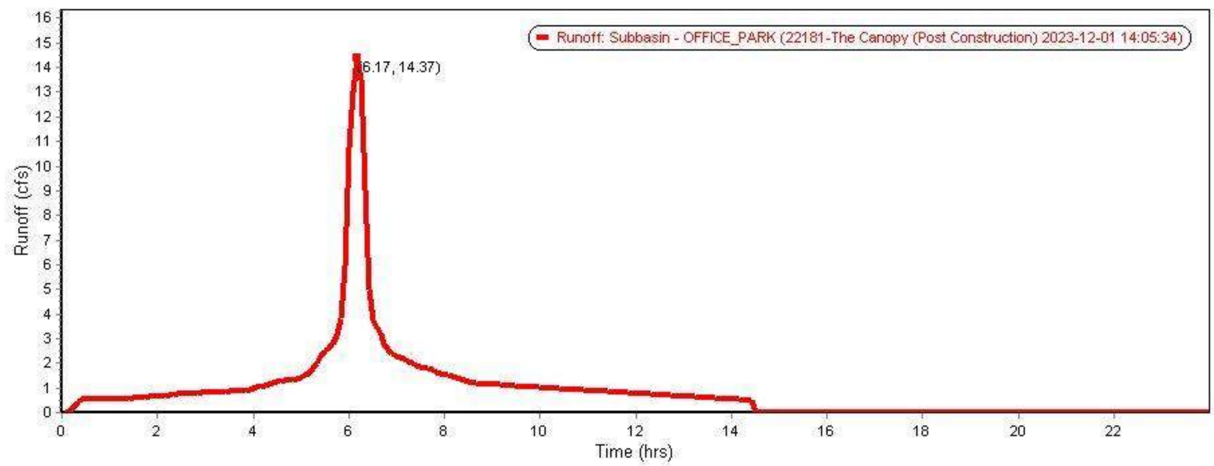
Element ID	Out-01
Maximum Total Inflow (cfs)	15.48
Minimum Total Inflow (cfs)	0.00
Event Mean Total Inflow (cfs)	1.10
Duration of Exceedances (hrs)	N/A
Duration of Deficits (hrs)	N/A
Number of Exceedances	N/A
Number of Deficits	N/A
Volume of Exceedance (ft³)	N/A
Volume of Deficit (ft³)	N/A
Total Inflow Volume (ft³)	95023.98
Detention Storage (ft³)	N/A

SCHEMATIC ANALYSIS MODEL



Plan View | Profile Plot | Time Series Plot

POST-CONSTRUCTION UNMITIGATED RUNOFF (OFFICE PARK)



Runoff Summary Table

Time period
From: 11/16/2023, 12:00:00 AM
To: 11/17/2023, 12:00:00 AM

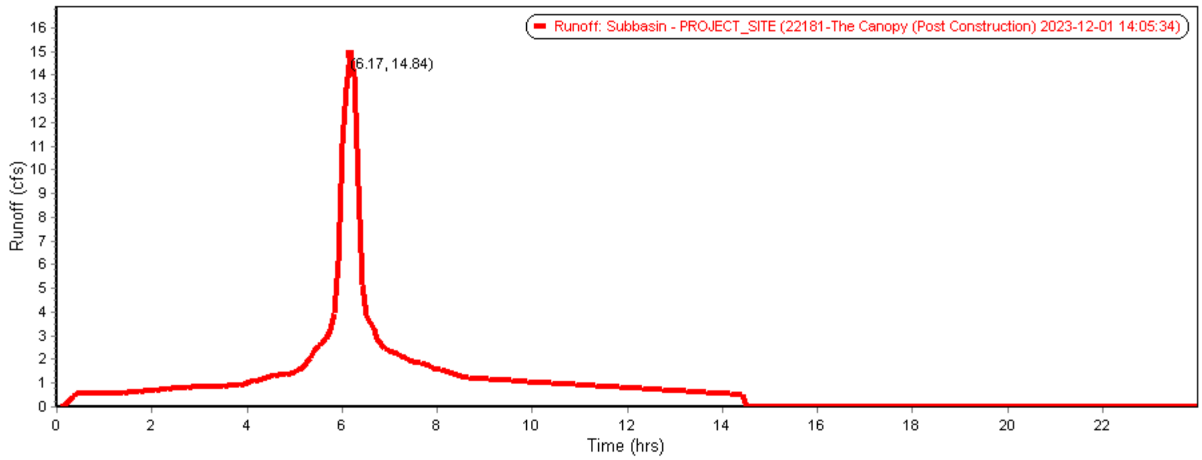
Thresholds
Exceedance: 0
Deficit: 0

Detention storage
Max flow: 0

Element ID	OFFICE_PARK
Maximum Runoff (cfs)	14.37
Minimum Runoff (cfs)	0.00
Event Mean Runoff (cfs)	0.88
Duration of Exceedances (hrs)	N/A
Duration of Deficits (hrs)	N/A
Number of Exceedances	N/A
Number of Deficits	N/A
Volume of Exceedance (ft³)	N/A
Volume of Deficit (ft³)	N/A
Total Runoff (ft³)	75822.6
Detention Storage (ft³)	N/A

Plan View | Profile P | Time Serie lot

POST-CONSTRUCTION UNMITIGATED RUNOFF (PROJECT SITE)



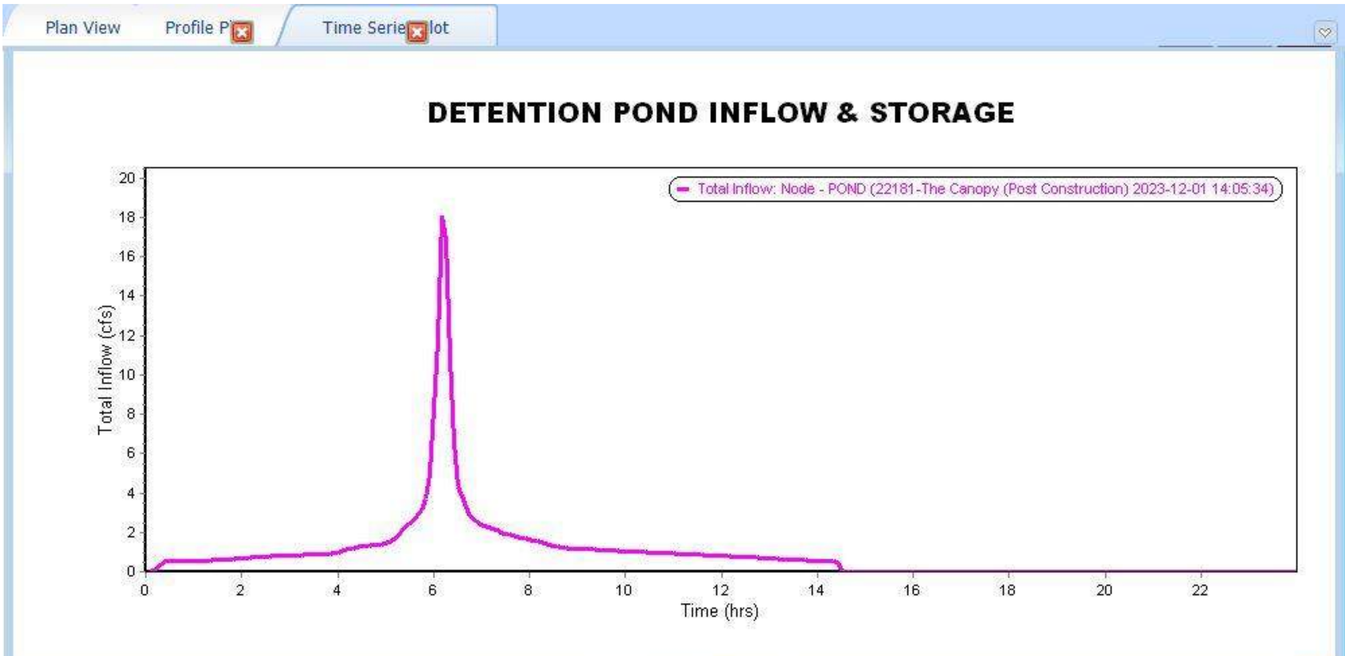
Runoff Summary Table

Time period
From: 11/16/2023, 12:00:00 AM
To: 11/17/2023, 12:00:00 AM

Thresholds
Exceedance: 0
Deficit: 0

Detention storage
Max flow: 0

Element ID	PROJECT_SITE
Maximum Runoff (cfs)	14.84
Minimum Runoff (cfs)	0.00
Event Mean Runoff (cfs)	0.91
Duration of Exceedances (hrs)	N/A
Duration of Deficits (hrs)	N/A
Number of Exceedances	N/A
Number of Deficits	N/A
Volume of Exceedance (ft³)	N/A
Volume of Deficit (ft³)	N/A
Total Runoff (ft³)	78296.4
Detention Storage (ft³)	N/A



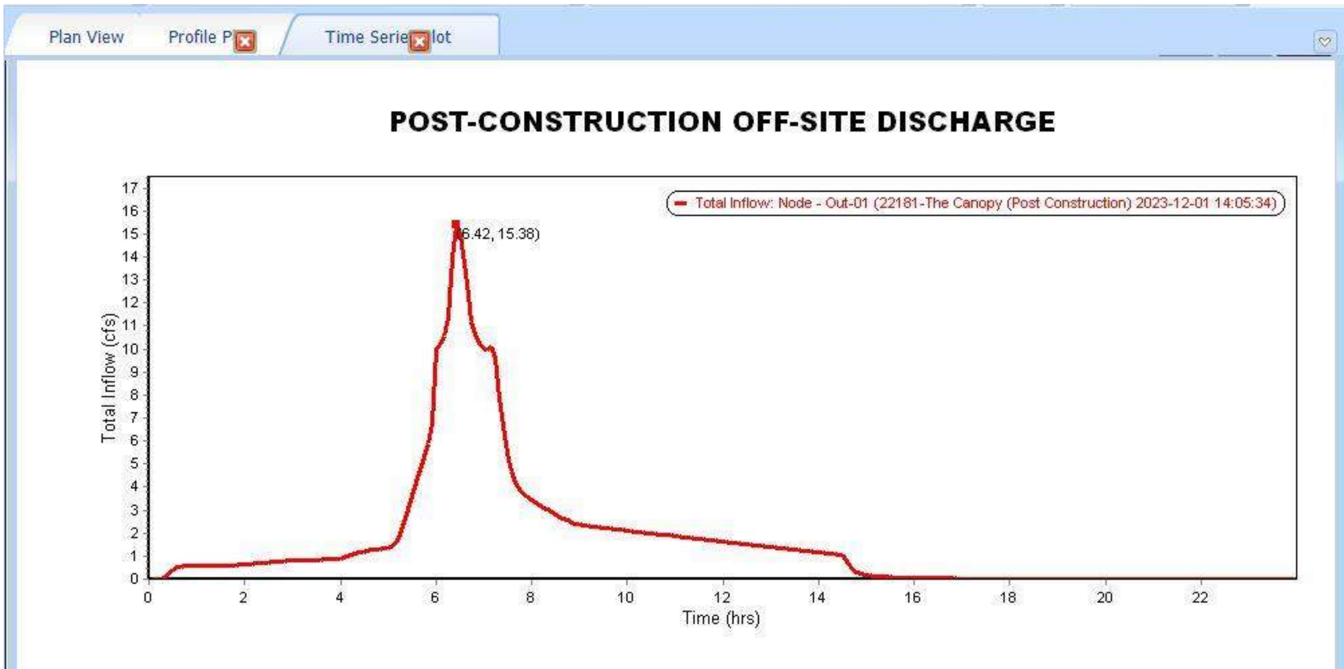
Total Inflow Summary Table

Time period
From: 11/16/2023, 12:00:00 AM
To: 11/17/2023, 12:00:00 AM

Thresholds
Exceedance: 0
Deficit: 0

Detention storage
Max flow: 0

Element ID	POND
Maximum Total Inflow (cfs)	18.04
Minimum Total Inflow (cfs)	0.00
Event Mean Total Inflow (cfs)	0.92
Duration of Exceedances (hrs)	N/A
Duration of Deficits (hrs)	N/A
Number of Exceedances	N/A
Number of Deficits	N/A
Volume of Exceedance (ft³)	N/A
Volume of Deficit (ft³)	N/A
Total Inflow Volume (ft³)	79437.98
Detention Storage (ft³)	N/A



Total Inflow Summary Table

Time period

From: 11/16/2023, 12:00:00 AM

To: 11/17/2023, 12:00:00 AM

Thresholds

Exceedance: 0

Deficit: 0

Detention storage

Max flow: 0

Element ID	Out-01
Maximum Total Inflow (cfs)	15.39
Minimum Total Inflow (cfs)	0.00
Event Mean Total Inflow (cfs)	1.61
Duration of Exceedances (hrs)	N/A
Duration of Deficits (hrs)	N/A
Number of Exceedances	N/A
Number of Deficits	N/A
Volume of Exceedance (ft³)	N/A
Volume of Deficit (ft³)	N/A
Total Inflow Volume (ft³)	138581.62
Detention Storage (ft³)	N/A

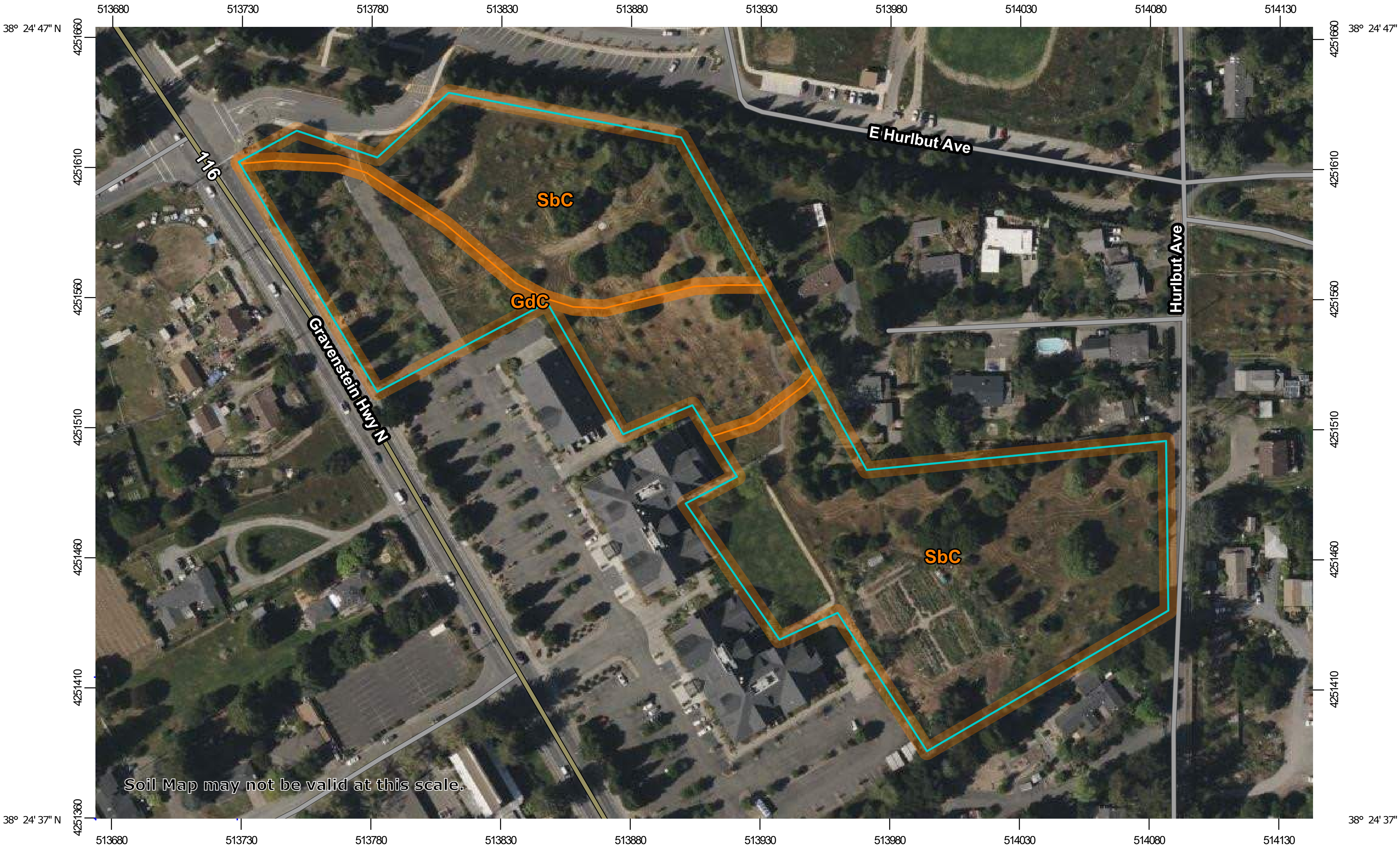
Appendix I

Soil Analysis

Soil Map—Sonoma County, California

122° 50' 36" W

122° 50' 16" W



122° 50' 36" W

122° 50' 16" W

Map Scale: 1:2,150 if printed on A landscape (11" x 8.5") sheet.

N

0 30 60 120 180 Meters

0 100 200 400 600 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 16, Sep 14, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 26, 2022—Apr 25, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GdC	Goldridge fine sandy loam, 2 to 9 percent slopes	2.2	28.2%
SbC	Sebastopol sandy loam, 2 to 9 percent slopes	5.7	71.8%
Totals for Area of Interest		**7.9**	**100.0%**

Sonoma County, California

SbC—Sebastopol sandy loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hfjc
Elevation: 100 to 1,000 feet
Mean annual precipitation: 40 inches
Mean annual air temperature: 55 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Sebastopol and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebastopol

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 24 inches: sandy loam
H2 - 24 to 28 inches: sandy clay loam
H3 - 28 to 57 inches: clay
H4 - 57 to 62 inches: clay loam
H5 - 62 to 72 inches: sandy clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C

Ecological site: R014XG912CA - Loamy Terrace
Hydric soil rating: No

Minor Components

Blucher
Percent of map unit: 5 percent
Hydric soil rating: No

Cotati
Percent of map unit: 5 percent
Hydric soil rating: No

Goldridge
Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 16, Sep 14, 2022

Sonoma County, California

GdC—Goldridge fine sandy loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hfcy
Elevation: 200 to 2,000 feet
Mean annual precipitation: 40 inches
Mean annual air temperature: 57 degrees F
Frost-free period: 225 to 240 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Goldridge and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Goldridge

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 24 inches: fine sandy loam
H2 - 24 to 28 inches: sandy clay loam
H3 - 28 to 72 inches: sandy clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F004BK103CA - Upper slopes and higher elevation mountains

Hydric soil rating: No

Minor Components

Blucher

Percent of map unit: 4 percent
Hydric soil rating: No

Cotati

Percent of map unit: 4 percent
Hydric soil rating: No

Sebastopol

Percent of map unit: 3 percent
Hydric soil rating: No

Steinbeck

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 16, Sep 14, 2022

Appendix I

Noise Report

Appendix I

Noise Report

PRELIMINARY ASSESSMENT OF ENVIRONMENTAL NOISE

THE CANOPY ENVIRONMENTAL IMPACT REPORT

CEQA NOISE REPORT

September 12, 2023

By

Veneklasen Associates, Inc.
1711 16th Street
Santa Monica, CA 90404

Contents

ASSESSMENT OF ENVIRONMENTAL NOISE

1.0 INTRODUCTION

This report evaluates potential impacts associated with the construction and operation noise of the Canopy multi-family townhome development in Sebastopol, CA.

1.1 Project Description

The proposed project consists of residential structures on a 6-acre site with twenty (20) three-story townhome buildings containing approximately seventy-five (75) townhome units. The project is centrally located on the proposed site and is not immediately adjacent to any major arterials. It is bounded by W. County and Rodata Trails to the north, existing residential properties to the east, and existing commercial properties to the south and west. The closest major arterial is Highway 116, located approximately 150 feet to the west.

1.2 Characteristics of Noise

Noise is usually defined as unwanted sound and can be an undesirable by-product of society's normal day-to-day activities. Sound becomes unwanted when it interferes with normal activities, causes actual physical harm, or has an adverse effect on health.

People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness." However, the sound pressure magnitude can be objectively measured and quantified using a logarithmic ratio of pressures which yields the level of sound, utilizing the measurement scale of decibels (dB). The decibel is generally adjusted to the A-weighted level (dBA) which de-emphasizes very low frequencies to better approximate the human ear's range of sensitivity. In practice, the noise level of a sound source is measured using a sound level meter that includes an electronic filter corresponding to the A-weighting curve. Table A.1 in Appendix A of this report defines the decibel along with other technical terms used in this analysis.

Even though the A-weighted scale accounts for the relative loudness perceived by the human ear and, therefore, is commonly used to quantify individual events or general community sound levels, the degree of annoyance or other response effects also depends on several other perceptibility factors, including:

- Ambient (background) sound level
- Magnitude of the event sound level relative to the background noise
- Spectral (frequency) composition (e.g. presence of tones)
- Duration of the sound event
- Number of event occurrences, repetitiveness, and intermittency
- Time of day the event occurs.

In determining the daily level of environmental noise, it is important to account for the difference in human responses to daytime and nighttime noises. At night, exterior background noise levels are generally lower than daytime levels. However, most household noise also decreases at night, and exterior noise may become increasingly noticeable. Further, most people sleep at night and have greater sensitivity to noise intrusion. To account for human sensitivity to nighttime noise levels, a 24-hour descriptor, the Day-Night Level (L_{dn}) has been developed. The L_{dn} divides the 24-hour day into a daytime period of 7:00 a.m. to 10:00 p.m. and a nighttime period of 10:00 p.m. to 7:00 a.m. In determining the L_{dn}, noise levels occurring during the nighttime period are increased by 10 dB to account for the greater sensitivity during the nighttime periods.

The effects of noise on people fall into three general categories:

- Subjective effects of annoyance and nuisance
- Interference with activities such as speech, sleep and learning
- Physiological effects such as hearing loss

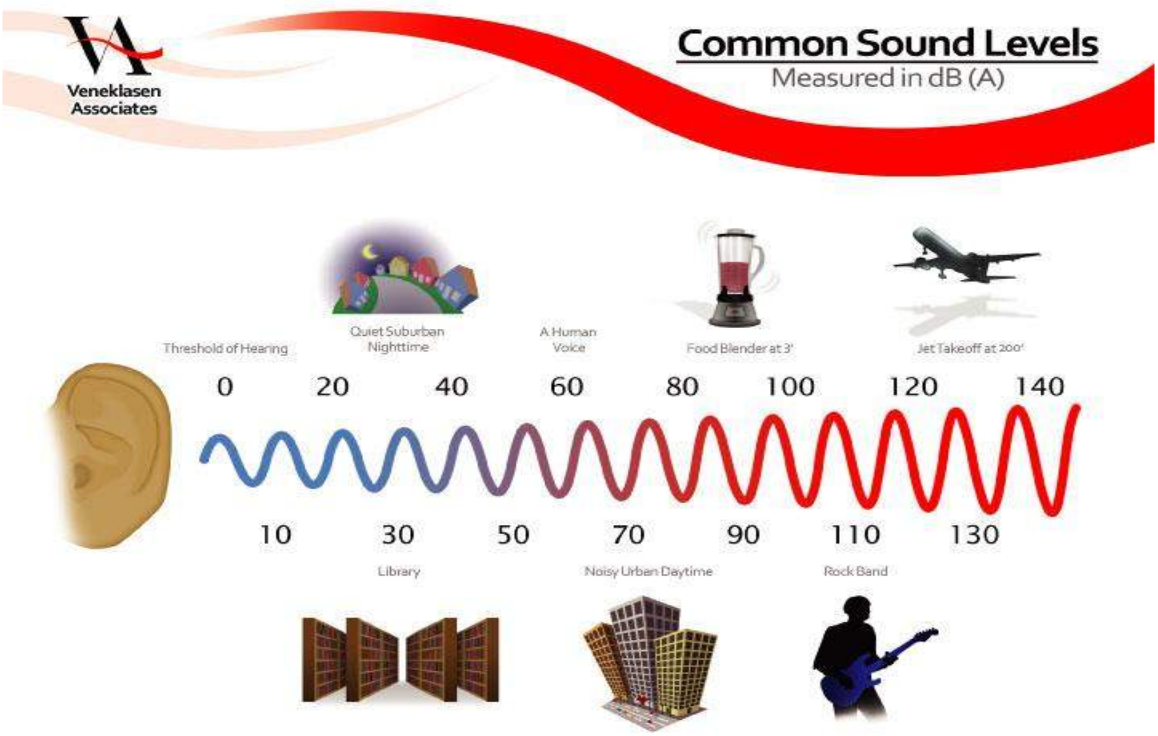
In most cases, the levels associated with environmental noise produce effects only in the first two categories. However, workers in industrial plants may experience noise effects in the last category. There is no completely effective way to measure the subjective effects of noise or the corresponding reactions of annoyance, because of the wide variation in individual thresholds of annoyance and degrees to which people become acclimated to noise. Thus, an important way of determining a person's subjective reaction to a new noise source is by comparison to the existing environment to which they are accustomed (the "ambient environment"). In general, the more the level of a noise event exceeds the prevailing ambient noise level, the less acceptable the noise source will be to those exposed to it.

With regard to increases in A-weighted noise levels, the following relationships are applicable to this analysis:

- Except in carefully controlled laboratory experiments, a 1 dB change cannot be perceived.
- Outside of a laboratory, a 3 dBA change will be generally perceivable by most people.
- A change in level of at least 5 dBA is considered a noticeable change by most people.
- A 10 dBA change will result in the perception of doubling or halving the loudness of the noise.

Common noise levels associated with various activities are shown in Figure 1.

Figure 1 – Common Noise Levels



Noise sources are either "point sources", such as stationary equipment or individual motor vehicles, or "line sources", such as a roadway with a large number of mobile point sources (motor vehicles). Sound generated by a stationary point source typically diminishes (attenuates) at a rate of 6 dBA for each doubling of distance from the source to the receptor at acoustically "hard" sites, and at a rate of 7.5 dBA at acoustically "soft" sites.[1] For example, a 60 dBA noise level measured at 50 feet from a point source at an acoustically hard site would be 54 dBA at 100 feet from the source and it would be 48 dBA at 200 feet from the source. Sound generated by a line source typically attenuates at a rate of 3 dBA and 4.5 dBA per doubling of distance from the source to the receptor for hard and soft sites, respectively.[2] Man-made or natural barriers can also attenuate sound levels.

The minimum attenuation of exterior to interior noise provided by typical structures is provided in Table 1.

---

1 U.S. Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (Springfield, Virginia: U.S. Department of Transportation, Federal Highway Administration, September 1980), p. 97. A "hard" or reflective site does not provide any excess ground-effect attenuation and is characteristic of asphalt, concrete, and very hard packed soils. An acoustically "soft" or absorptive site is characteristic of normal earth and most ground with vegetation.

2 U.S. Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (Springfield, Virginia: U.S. Department of Transportation, Federal Highway Administration, September 1980), p. 97.

Table 1 – Outside to Inside Noise Attenuation (dBA)

Building Type	Open Windows	Closed Windows[1]
Residences	17	25
Schools	17	25
Churches	20	30
Hospitals/Convalescent Homes	17	25
Offices	17	25
Theaters	20	30
Hotels/Motels	17	25

Source: Transportation Research Board, National Research Council, Highway Noise: A Design Guide for Highway Engineers*, National Cooperative Highway Research Program Report 117.*

[1] *As shown, structures with closed windows can attenuate exterior noise by a minimum of 25 to 30 dBA.*

1.3 Characteristics of Vibration

Vibration is minute variation in pressure through structures and the earth, whereas, noise is minute variation in pressure through air. Some vibration effects can be caused by noise; e.g., the rattling of windows from truck pass-bys. This phenomenon is related to the coupling of the acoustic energy at frequencies that are close to the resonant frequency of the material being vibrated. Ground-borne vibration attenuates rapidly as distance from the source of the vibration increases. Vibration amplitude can be measured as peak particle velocity (PPV), the maximum instantaneous peak amplitude in inches per second, or root-mean-square (RMS) velocity in inches per second or as vibration level in decibels (VdB) referenced to 1 micro-inch per second. The ratio between the PPV and the maximum RMS amplitude is termed the "crest factor." According to the Federal Transit Administration (FTA), the PPV level for construction equipment is typically 1.7 to 6 times greater than the RMS vibration level. The FTA uses a crest factor of 4 for the conversion of PPV levels to RMS vibration levels. For the purposes of ground-borne vibration analysis of impacts to existing structures, vibration velocity is described in terms of PPV. For the analysis of the human response to vibration, VdB is utilized.

The vibration velocity threshold of perception for humans is approximately 65 VdB, and a vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people[3]. Most perceptible indoor vibration is caused by sources within buildings such as operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. Common ground-induced vibrations related to roadway traffic and construction activities pose no threat to buildings or structures. If a roadway is smooth, the ground-borne vibration from traffic is barely perceptible. The range of interest is from approximately 50 VdB, which is typically the background vibration velocity, to 94 VdB. This 94 VdB vibration level corresponds to 0.2 PPV, which is the general threshold where minor damage can occur in non-engineered timber and masonry buildings.

3 – U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, (Washington, DC: U.S. Department of Transportation, Federal Transit Administration, May 2006), p. 7-8.

2.0 REGULATORY FRAMEWORK

Many government agencies have established noise regulations and policies to protect citizens from potential hearing damage and various other adverse physiological and social effects associated with noise and ground-borne vibration. The City of Sebastopol has adopted the Noise Hazards section of the General Plan, which is based in part on federal and State regulations and is intended to control, minimize or mitigate environmental noise effects. The regulations and policies that are relevant to project construction and operation noise are discussed below.

2.1 Applicable State Noise Standards

The State of California has adopted noise compatibility guidelines for general land use planning. The types of land uses addressed by the State standards and the acceptable noise categories for each land use are included in the State of California General Plan Guidelines, which is published and updated by the Governor's Office of Planning and Research. The level of acceptability of the noise environment is dependent upon the activity associated with the particular land use. According to the State, an exterior noise environment up to 65 CNEL is "normally acceptable" for single and multi-family residential uses, up to 75 CNEL is "conditionally acceptable" with special noise insulation requirements, while 75 CNEL and above is identified as "clearly unacceptable" noise levels for residential and hotel uses, respectively.[4] The maximum allowable interior noise level for residential structures is 45 CNEL.

Appendix G of the California Environmental Quality Act (CEQA) Guidelines establishes thresholds for the evaluation of significant impacts of environmental noise attributable to a proposed project. Under these thresholds, a proposed project would have a significant noise impact if the project would result in:

1. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established by the local general plan or noise ordinance, or applicable state or other agencies;

2. Generation of excessive ground-borne vibration or ground-borne noise levels; and

3. For a project 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?

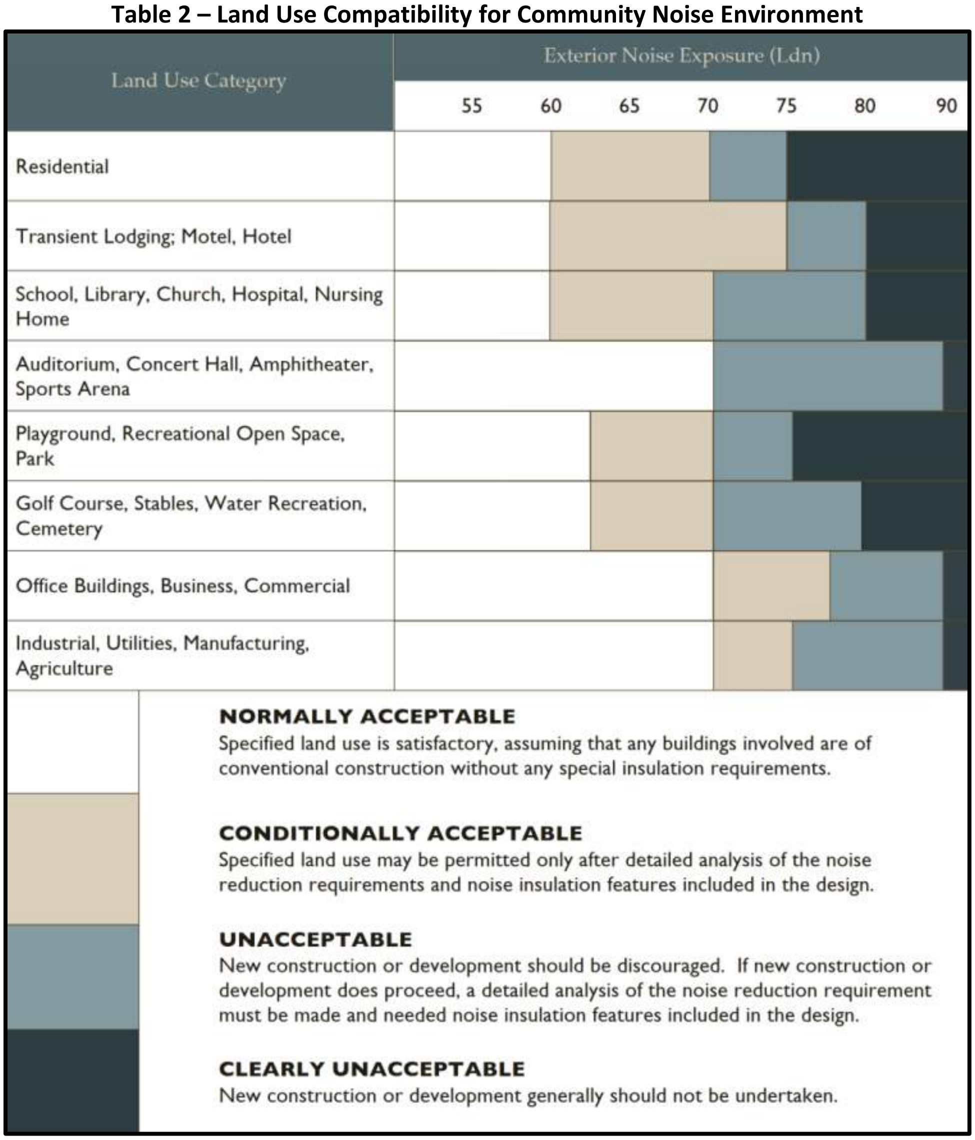
The CEQA Guidelines and the City's General Plan provide no definition of what constitutes a substantial noise increase. Typically, in high noise environments, if the CNEL due to the project would increase by 3 dBA at noise sensitive receptors, the impact is considered significant.

[4] – State of California, Governor's Office of Planning and Research, *General Plan Guidelines*, (Sacramento, CA: State of California, Governor's Office of Planning and Research, October 2003), p. 250.

2.2 City of Sebastopol General Plan – Noise

The Noise section of the General Plan identifies noise and land use compatibility standards for various land uses. The City's goal is to address major noise sources and to promote safe and comfortable noise levels throughout Sebastopol. The Land Use Compatibility for Community Noise Environment from the Noise section of the General Plan is shown in Table 2 and is used to determine the compatibility of land uses when evaluating proposed development projects.

Table 2 – Land Use Compatibility for Community Noise Environment



For a residential development, the City's land use compatibility indicates that the maximum "normally acceptable" exterior noise level is 60 L_{dn}. For a residential development with exterior noise levels up to 70 L_{dn}, the land use is "conditionally acceptable", in which the specified land use may be permitted only after detailed analysis of the noise reduction requirements and noise insulation features included in the design. This study will review the exterior noise levels to verify it is within the range of acceptability per the City's land use compatibility.

The City's General Plan has also established noise standards for residential land uses impacted by stationary (non-transportation) sources, such as mechanical equipment or similar. The standards do not apply to transportation sources, such as car pass-by's or emergency vehicles. See Table 3 for the criteria for stationary (non-transportation) sources.

Table 3 – Stationary (Non-Transportation) Noise Source Standards

Land Use Receiving the Noise	Hourly Noise-Level Descriptor	Exterior Noise-Level Standard (dBA)	
		Daytime (7am-10pm)	Nighttime (10pm-7am)
Residential	L_{eq} L_{max}	55 70	45 65

Notes:

a) The residential standards apply to all properties that are zoned for residential use. The exterior noise level standard is to be applied at the property line of the receiving land use or at a designated outdoor activity area (at the discretion of the Planning Director) of the new development. For mixed-use projects, the exterior noise level standard may be waived (at the discretion of the Planning Director) if the project does not include a designated activity area and mitigation of property line noise for on-site uses is not practical. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings). The City can impose standards that are more restrictive than specified above based upon determination of existing low ambient noise levels.

b) Each of the noise levels specified above shall be lowered by 5 dBA for tonal noises characterized by a whine, screech, or hum, noises consisting primarily of speech or music, or recurring impulsive noises. In no case shall mitigation be required to a level that is less than existing ambient noise levels, as determined through measurements conducted during the same operational period as the subject noise source.

c) In situations where the existing noise level exceeds the noise levels indicated in the above table, any new noise source must include mitigation that reduces the noise level of the noise source to the existing level plus 3 dB.

Note b) indicates that the criteria are to be reduced by 5 dBA for tonal noises characterized by a whine, screech, or hum, noises consisting primarily of speech or music, or recurring impulsive noises. Note c) indicates that in situations where the existing noise levels at a project site exceed the noise levels per the standards, the new noise sources must include mitigation that reduces the noise level to the existing ambient, plus 3 dB. For example, if the existing ambient noise level was 60 dBA L_{eq}, the nearest receiving residential property impacted by stationary noise sources within the proposed development must meet a noise level of 63 dBA L_{eq} at the receiving property.

Lastly, the City's General Plan includes a list of various policies and actions to meet Goal N-1 set forth by the City to preserve an appropriate noise environment and enhance the quality of existing and future land uses by minimizing exposure to harmful and excessive noise. The policies and actions listed below to achieve the goal, limited to those applicable to the project:

Policy N 1-1: Ensure the noise compatibility of existing and future developments when making land use planning decisions.

Policy N 1-2: Require development and infrastructure projects to be consistent with the Land Use Compatibility for Community Noise Environments standards (see Table 2) to ensure acceptable noise levels for existing and future development.

Policy N 1-3: Require new development to mitigate excessive noise through best practices, including building location and orientation, building design features, placement of noise-generating equipment away from sensitive receptors, shielding of noise-generating equipment, placement of noise-tolerant features between noise sources and sensitive receptors, and use of noise-reducing materials.

Policy N 1-4: Require mixed-use projects to minimize noise exposure for indoor areas of nearby residential areas through the use of noise attenuating building materials, engineering techniques, and site design practices. Site design practices may include locating mechanical equipment, loading bays, parking lots, driveways, and trash enclosures away from residential uses, and providing noise-attenuating screening features on-site.

Policy N 1-6: Require acoustical studies for new developments, projects seeking use permits related to activities that would increase noise levels, and transportation improvements that affect noise-sensitive uses such as schools, hospitals, libraries, group care facilities, convalescent homes, and residential areas.

Policy N 1-7: For projects that are required by the California Environmental Quality Act (CEQA) to analyze noise impacts, the following criteria shall be used to determine the significance of those impacts:

Stationary and Non-Transportation Noise Sources

- A significant impact will occur if the project results in exceedance of the noise level standards contained in the Noise Element, or the project will result in an increase in ambient noise levels by more than 3 dB, whichever is greater. This does not apply to construction activities which are conducted according to the best practices outlined in Action N-1f. Compliance with the requirements outlined in Action N-1f shall be sufficient to reduce construction-related noise impacts to a less than significant level.

Transportation Noise Sources

- Where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +5 dB L_{dn} increase in roadway noise levels will be considered significant; and

- Where existing traffic noise levels range between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +3 dB L_{dn} increase in roadway noise levels will be considered significant; and

- Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +1.5 dB L_{dn} increase in roadway noise will be considered significant.

Policy N 1-8: Support noise-compatible land uses along existing and future roadways, including County, State, and Federal routes.

Policy N 1-11: Ensure that existing development is protected, to the greatest extent feasible, from noise impacts due to construction on adjacent or nearby properties through implementation of best practices, as outlined in Action N-1f.

Policy N 1-13: Control non-transportation related noise from site specific noise sources to the standards shown in Table 3.

Policy N 1-14: Ensure that new development does not result in indoor noise levels exceeding 45 dBA L_{dn} for residential uses.

Policy N 1-15: Require construction activities to comply with standard best practices (see Action N-1f).

Policy N 1-18: Ensure that an acceptable noise environment is maintained in residential areas and areas with sensitive uses by ensuring that uses, operations, and fixed equipment maintain compliance with City standards and by providing for the regulation of short-term increases in non-transportation noise levels through the Municipal Code.

In conjunction with the policies defined herein, the City has provided a list of actions to ensure that Goal N-1 of the General Plan is being achieved. Applicable actions associated with the project are as follows, with the exception of Action N-1a which is associated with updating of the City's Municipal Code:

Action N-1b: Continue to implement and enforce the requirements of Chapter 8.25 of the Sebastopol Municipal Code in order to reduce nuisance noise from stationary sources near residential areas.

Action N-1c: Review new development projects for compliance with the noise requirements established in the City's Noise Element, including the standards established in Table 2 and Table 3. Where necessary, require mitigation measures to achieve noise standards.

Action N-1d: Require acoustical studies for all new discretionary projects, including those related to development and transportation, which have the potential to generate noise impacts which exceed the standards identified in the City's Noise Element. The studies shall include representative noise measurements, estimates of existing and projected noise levels, and mitigation measures necessary to ensure compliance with the City's Noise Element and relevant noise standards in the Sebastopol Municipal Code.

Action N-1f: Require construction projects that may generate excessive noise impacts to implement the following types of standard best practices, as applicable, to reduce construction noise impacts to the extent feasible:

- Noise-generating construction activities, including truck traffic coming to and from the construction site for any purpose, shall be limited as specified in the Noise Ordinance.
- All equipment driven by internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.
- The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.
- At all times during project grading and construction, stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from residences.
- Unnecessary idling of internal combustion engines shall be prohibited.
- Construction staging areas shall be established at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction activities, to the extent feasible.
- Neighbors located adjacent to the construction site shall be notified of the construction schedule in writing.
- The construction contractor shall designate a "noise disturbance coordinator" who will be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall be responsible for determining the cause of the noise complaint (e.g., starting too early, poor muffler, etc.) and instituting reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site.

2.3 City of Sebastopol Municipal Code – Chapter 8.25, Noise Ordinance

The goal of the City's Noise Ordinance is to prohibit unnecessary, excessive, and annoying noises, subject to its police power. There are various sections of the Noise Ordinance that are directly related and applicable to the project. Section 8.25.060 establishes the noise level standards for residential land uses as provided in Table 4, which are consistent with Table 3 from the Noise Element within the City's General Plan.

Table 4 – City of Sebastopol Noise Level Standards

Exterior Noise Standards	
Monday thru Friday	
8:00 am – 10:00 pm	55 dBA
10:00 pm – 8:00 am	45 dBA
Saturday and Sundays before Observed Holidays	
9:00 am – 10:00 pm	55 dBA
10:00 pm – 9:00 am	45 dBA
Sunday	
9:00 am – 7:00 pm	55 dBA
7:00 pm – 9:00 am	45 dBA

Item 4 within section 8.25.060 is specifically for areas with high background noise and impulse noise. It states in cases where the background noise levels caused by sources not subject to these regulations exceed the standards listed in Table 4, a source shall be considered to cause excessive noise if the noise emitted by such source exceeds the background noise levels by 5 dBA, provided that no source subject to the provisions of the Noise Ordinance shall emit noise in excess of 80 dBA at any time. Item 4 also states no person shall cause or allow the emission of impulse noise in excess of 80 dB peak sound pressure level during the nighttime to any residential zone or in excess of 100 dB peak sound pressure level at any time in any zone.

Item 6 within section 8.25.060 lists exemptions to the Noise Ordinance, which are as follows:

- Noise generated by any construction equipment which is operated during daytime hours, defined for the purposes of this section as from 7:00 am to 8:00 pm, Monday through Friday, 8:00 am to 5:00 pm on Saturdays, and from 8:00 am to 5:00 pm on Sundays.

- Noise created as a result of or relating to an emergency.

- Noise from demolition work conducted during daytime hours (see Table 4). When considered emergency work, demolition shall be exempted at all times from the noise levels in the Noise Ordinance.

- Noise created by any aircraft flight operations which are specifically permitted by the Federal Aviation Administration.

- Noise created by any recreational activities on public property which are permitted by law and for which a license or permit has been granted by the City, including but not limited to parades, sporting events, concerts, and fireworks displays.

- Noise created by blasting other than that conducted in connection with construction activities shall be exempted; provided, that the blasting is conducted between 8:00 am and 5:00 pm local time at specified hours previously announced to the local public; and provided, that a permit for such blasting is obtained from the appropriate Federal, State or local authorities.

- Noise created by refuse and solid waste collection; provided, that the activity is conducted during daytime hours (see Table 4).

- Noise generated by the police and other established shooting facilities as permitted by California law.

Therefore, per the City's Noise Ordinance, the noise emitted by the project itself must comply with the City's Noise Level Standards as defined in Table 4. This would apply to items such as mechanical equipment, outdoor common areas, or similar uses. Construction noise is exempt from the Noise Ordinance provided that it occurs during the hours listed within the ordinance and that construction activities follow the best practices defined in the General Plan described in section 2.2.

2.4 City of Sebastopol General Plan – Ground-Borne Vibration

The City's General Plan, within its policies and actions to achieve Goal N-1 described in section 2.2, lists requirements associated with construction vibration. Policy N 1-16 is directly applicable to the project and to all construction associated with the development, which is listed below:

Policy N 1-16: Require new development to minimize vibration impacts to adjacent uses during demolition and construction. A vibration limit of 0.30 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction.

Therefore, in order to comply with the City's General Plan, any vibration associated with the construction of the project must be limited to 0.30 in/sec PPV.

2.5 Project Requirements

The requirements described herein for the project are summarized in Table 5.

Table 5 – Project Requirements

Activity	Standard
Land Use Compatibility	Exterior noise level at project site is no greater than 70 dB L_{dn}
Stationary and Non-Transportation Sources	Noise generated by the project does not: • Increase the existing daytime or nighttime ambient by 3 dB • Exceed 55 dBA during daytime hours (7:00 am to 10:00 pm) • Exceed 45 dBA during nighttime hours (10:00 pm to 7:00 am)
Transportation Noise Sources	Traffic noise increase due to the project is less than: • 5 dB L_{dn} at areas where existing noise is less than 60 dB L_{dn} • 3 dB L_{dn} at areas where existing noise is between 60 and 65 dB L_{dn} • 1.5 dB L_{dn} at areas where existing noise is greater than 65 dB L_{dn}
Interior Noise in Residences	Levels are no greater than 45 L_{dn}
Construction Noise	Construction is limited between the hours of: • 7:00 am to 8:00 pm, Monday through Friday • 8:00 am to 5:00 pm, Saturdays and Sundays Construction follows best practices as defined in: • Action N-1f within the City's General Plan (see section 2.2)
Vibration	Levels are no greater than 0.30 in/sec PPV at nearest sensitive receptors

3.0 ENVIRONMENTAL IMPACTS AND SIGNIFICANCE

3.1 Significance Thresholds

The following thresholds are used to evaluate the potential significance of the project noise impacts, as defined within the Noise Element of the City of Sebastopol General Plan and consistent with the State standards:

- For ambient noise level increases associated with permanent stationary and non-transportation noise sources, if the project results in exceedance of the noise level standards contained in the Noise Element, or the project will result in an increase in ambient noise levels by more than 3 dB, whichever is greater.
- For ambient noise level increases associated with new transportation noise sources, where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +5 dB L_{dn} increase in roadway noise levels will be considered significant.
- For temporary noise level increases associated with construction activities, compliance with the requirements outlined in Action N-1f within the General Plan in addition to construction activities occurring during the hours indicated per the Noise Ordinance.
- For temporary vibration sources, if the project's construction exceeds the limit of 0.30 in/sec PPV, which has the potential for cosmetic damage at buildings of normal conventional construction.

3.2 Impact 1. Permanent increase in ambient noise levels

Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or Noise Ordinance or applicable standards of other agencies?

3.2.1 Methodology

Analysis of the existing and future noise environments presented in this section is based on technical reports, noise monitoring, and noise prediction modeling. Noise modeling procedures involved the calculation of existing and future vehicular noise levels along individual roadway segments. This was accomplished using the Federal Highway Administration Highway Traffic Noise Prediction Model. The California Department of Transportation (Caltrans) published the "Technical Noise Supplement (TeNS)" in October of 1998 which defines how to predict traffic noise for projects in California. The TeNS, Section N-5520 requires that any traffic noise study conducted after March 30, 2000 utilize the calculation methods used by Federal Highway Administration (FHWA). This model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site conditions. The off-site traffic noise is analyzed on an increase in L_{dn} basis to determine the project's impact.

Traffic volumes utilized as data inputs to the noise prediction model are calculated based on information provided in the traffic study by Memorandum of Assumptions for The City Ventures Canopy Project Traffic Study, dated July 10, 2023, and information available in Caltrans web site.

3.2.2 Existing Ambient Monitored Noise Levels

The proposed project site is bounded by W. County and Rodata Trails to the north, existing residential properties to the east, and existing commercial properties to the south and west in Sebastopol, CA. The closest major arterial is Highway 116, located approximately 150 feet to the west. Traffic from Highway 116 is the primary source of noise in the general area of the site.

To establish existing ambient noise levels in areas surrounding the project site, a field monitoring study was conducted. Measurements were performed in and around the project site for documenting the ambient conditions. NTi XL2 sound level meters were used for this purpose, which satisfy the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation. Vehicular traffic is the predominant noise source around the project site. Measurements were performed at several locations as shown in Figure 2. The measurements occurred at these locations on May 9th and 10th, 2023. Noise readings were measured over 5-minute intervals with "A" frequency slow time weighting. The weather conditions were normal, and no anomalies were present during the survey periods.

Table 6 provides the noise level data associated with each monitoring period for each location. As shown, Ldn noise levels ranged from 57 dBA closest to Highway 116 to 47 dBA at the back of the property. Position L1 was intended to capture the noise levels nearest to the proposed outdoor area for the project, whereas position L2 was intended to primarily capture traffic noise from Highway 116. The Exterior Noise Standards set forth by the City's Noise Element of the General Plan and by the Noise Ordinance are described in Table 2 and Table 5. Per Table 2, Land Use Compatibility for Community Noise Environment Normally Acceptable levels is 60 Ldn and the measured levels are below the above criteria.

Figure 2 – The Canopy Project Site and Noise Monitoring Locations

Table 6 – Existing Ambient Monitored Noise Levels

Position	Primary Noise Source	Time	Day time Noise Level (dBA L_{eq})	Nighttime Noise Level (dBA L_{eq})	24-hour Noise Level (dBA L_{dn})
L1	General Ambient	4:00 pm – 3:00 pm (next day)	46	38	47
L2	Highway 116	4:00 pm – 3:00 pm (next day)	55	48	57
S1	Harlbut Avenue	2:55 pm – 3:10 pm	50	N/A	N/A

Notes:
Noise measurements taken on May 9 and May 10, 2023.
Source: Veneklasen Associates Inc., 2023.

3.2.3 Future Exterior Project Noise Levels

The future traffic conditions (AADT) for the local roads were not available in the City of Sebastopol or in the provided Transportation Impact Analysis Report for the project.

Per the Caltrans website, the AADT traffic count on Highway 116 is 16400 for the year 2013 and 16700 for the year 2020.The traffic increment is 1.8 percent for 7 years. Using the above calculation, the predicted year 2033 AADT traffic count on Highway 116 will be 17117. Per the memorandum of Assumptions for The City Ventures Canopy Project Traffic Study, the trip generation due to the project is 684, and the total future traffic count (AADT) is approximately 17801 in the Year 2033.

The predicted exterior noise levels are less than the City of Sebastopol General Plan, Normally Acceptable criteria level for residential zones of Ldn 60. Based on the FHWA Traffic Noise Prediction model, the future noise level at the L1 and L2 from Highway 116 will be 49 Ldn and 58 Ldn, respectively. The noise levels generated by the project due to traffic cause less than a 5 Ldn increase in the existing ambient levels at the site, and therefore the impact due to project traffic is less than significant.

Further, interior noise levels in the residential spaces of the project depend on the wall construction material and glazing used for windows and doors. Veneklasen calculated the interior noise level using the predicted future exterior noise level with project contribution. The drawings do not show the exterior wall composition and the glazing area on the exterior wall. Veneklasen assumes that the exterior wall will consist of a coat of stucco over sheathing on wood stud with a single layer of gypsum board on the interior and batt insulation in the cavity. Also, the window/door opening to the exterior wall is assumed to be 40 to 60 percent respectively. Figure 3 shows the zoning area based on the noise distribution, and Table 7 shows the windows and doors with STC rating of the glazing as described in Appendix C. The impact is less than significant with Mitigation 1 described below.

Table 7 – Calculated Interior LDN

Location	Floor	Exterior LDN (dB)	Window/ Door Rating[5]	Interior LDN (dB)
Zone A	All	55 – 60	STC 28	43 – 45
Remaining Units	All	≤ 55	No STC requirement. STC 28 recommended.	

[5] STC rating does not fully specify the building element performance. Refer to Appendix C.

Figure 3 – Noise Zones

Mitigation 1. Provide STC 28 rated glazing for windows and doors for the Zone A area, as marked in Figure 3, to meet the criteria mentioned in Table 5. With the above mitigation, the impact is less than significant.

3.2.4 Operational Noise

An illustrative site plan has been developed for the project, which can be seen in Figure 4 below. Although specific details of the project have not been finalized, there are multiple design elements that can be assumed from the project's site plan. The assumptions are as follows:

- An outdoor common area will be located at the northeast portion of the project site that will generate activities anticipated to generate noise levels beyond typical conversation.
- Mechanical and electrical equipment, such as split-system outdoor condensing units and transformers (less than 2000 kVA), will be located at grade.
- General walkways and other small convening areas will be located throughout the project site wherein levels are not anticipated to be any greater than typical conversation.

Figure 4 – Illustrative Site Plan of The Canopy

At the location of the common area (shown in blue in Figure 4 above), Veneklasen anticipates that activities will generate noise levels beyond typical conversation; however, the drawing shows every house has a courtyard; therefore, it is not expected large gatherings at the common spaces and noisy playing activities. Therefore, this impact is not significant.

For the mechanical and electrical equipment, split-system outdoor condensing units and transformers (less than 2000 kVA) are anticipated consistent with similar residential construction. Based on published sound power data for outdoor condensing units typically used in residential applications, the noise level is expected to be less than 55 dBA at 15 feet from the equipment and less than 45 dBA at 60 feet. For transformers no greater than 2000 kVA, the noise level is expected to be less than 55 dBA at 30 feet and less than 45 dBA at approximately 120 feet. The site plan suggests that condensing units will be located within 60 feet of noise-sensitive receptors and that transformers will be located within 120 feet of noise-sensitive receptors. Considering that the condensing units will run simultaneously during the summer months, a boundary wall is required to minimize the impact to adjacent noise-sensitive receivers. The barrier height must be tall enough such that it limits any line-of-sight to the nearby residences to the west and south of the project site. The minimum density of the barrier shall be 2 lbs./sq. ft with no holes or gaps. An acoustical analysis shall be completed once final equipment selection is made to verify compliance with the City's Exterior Noise Standards at noise-sensitive receptors.

Mitigation 2: For outdoor condensing and mechanical units directly adjacent to noise-sensitive receptors, provide a solid barrier with a height blocking line-of-sight to the nearby noise-sensitive receptors. The minimum density of the barrier shall be 2 lbs./sq. ft with no holes or gaps. Once final equipment selection is made, an acoustical analysis of the noise from project mechanical and electrical equipment to surrounding properties must be completed by a qualified acoustical consultant prior to final design to verify compliance with the City's Exterior Noise Standards.

This impact is anticipated to be less than significant with mitigation.

3.2.5 Temporary increase in ambient noise levels

The construction of the proposed project would increase noise levels in the area. The construction noise impacts were analyzed for long-term noise exposure due to all anticipated construction equipment operating during each phase of construction, as well as for short-term noise exposure from equipment operating along the project site perimeter. Typical construction equipment utilized for each type of activity is indicated in Appendix B. The specific project construction phases have not been decided yet; however, the client has provided a tentative construction equipment list that can be used in the project.

Table 8 shows the typical construction equipment list and noise levels for each equipment at 50 feet with its utilization factor. The equipment used in each construction phase are shown in Table 9.

Table 8 - Typical Construction Equipment Noise

Equipment Type	FHWA Lmax @ 50 ft.	Usage Factor (%)
Excavator	81	40
Loader	79	40
Grinder	80	40
Rubber Tired Dozer	82	40
Tractor/Loader/Backhoe	84	40
Grader	85	40
Forklifts	84	40
Generator Sets	81	50
Welder	74	40
Paver	77	50
Paving Equipment	82	20
Rollers	80	20
Air Compressors	78	40

Considering the similar type of projects, Veneklasen assumes this project consists of five construction phases, as shown in Table 9, and Table 10 shows the distance to each receiver from the project area, center of Zone A and B

Table 9 – Construction Equipment used in Construction Phases

Phase	Equipment	Number of Units
Site Preparation	Dozer	2

	Truck	2
	Scraper	2
	Backhoe	2
Grading	Grader	2
	Dozer	3
	Scraper	1
	Backhoe	2
Building Construction	Front End Loader	2
	Generator	3
	Backhoe	2
	Welder/torch	1
	Compressor	5
Architectural Coating	--	--
Paving	Paver	2
	Roller	3

Table 10 - Distance to the Sensitive Receivers from the Center of Project Site

Receptor Group for Analysis	Address	Cardinal Direction from Project Site	Type of Receptor	Distance from Center of Project Site (ft)
NVSR-1	1005 Gravenstein Hwy N	South	Commercial	141 (Zone A)
NVSR-2	Oreily Media, 1005 Gravenstein Hwy N	South	Commercial	277 (Zone A)
NVSR-3	7066 Winona Ln	Southeast	Residential	255 (Zone A)
NVSR-4	7605 Winona Ln	East	Residential	338 (Zone A)
NVSR 5	1090 CA 116	West	Residential	408 (Zone A)
NVSR-6	Oreily Media, 1005 Gravenstein Hwy	Southwest	Commercial	388 (Zone B)
NVSR-7	1003 Gravenstein Hwy N	North	Commercial	247 (Zone B)
NVSR-8	896 Hurlbut Ave	South	Residential	163 (Zone B)
NVSR-9	939 Hurlbut Ave	East	Residential	215 (Zone B)
NVSR-10	970 Hurlbut Ave	Northeast	Residential	177 (Zone B)
NVSR-11	7589 Winona Ln	North	Residential	182 (Zone B)
NVSR-12	7605 Winona Ln	North-northwest	Residential	263 (Zone B)

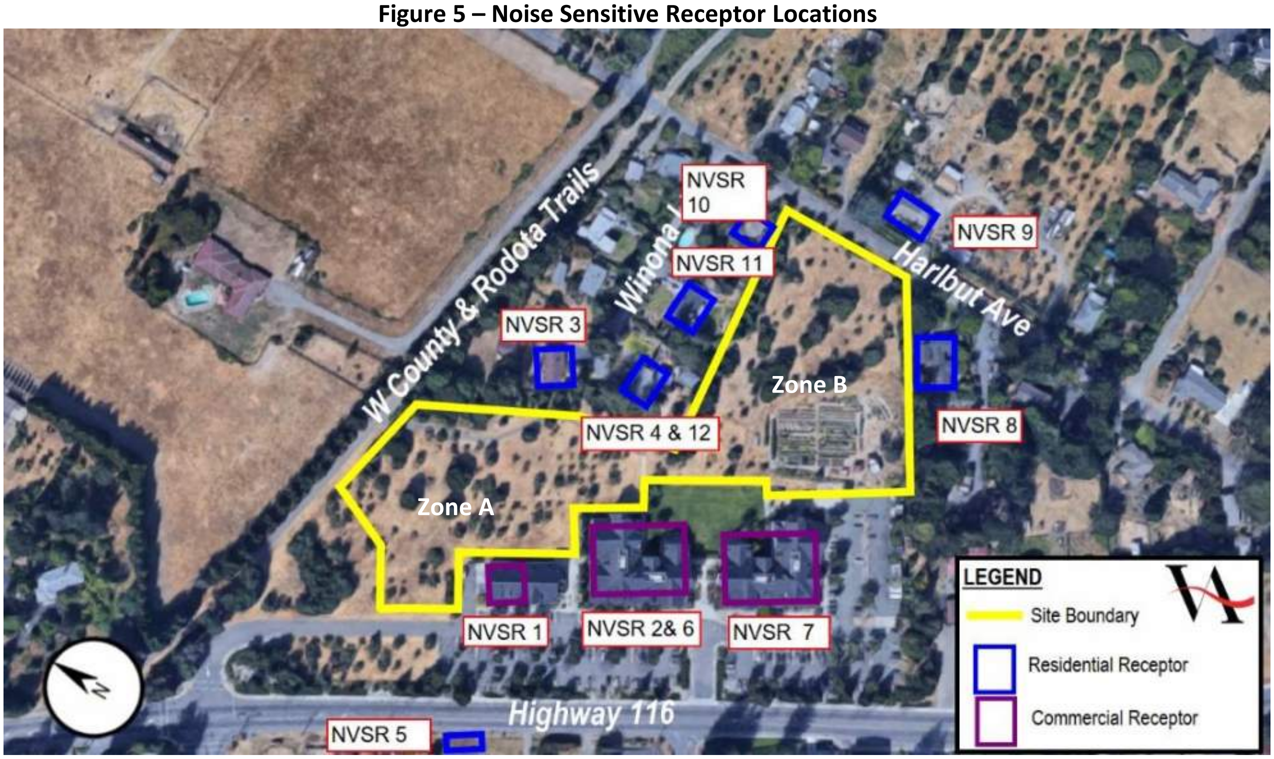
The nearest off-site residential sensitive receivers are located to the west (NVSA 5) and east (NVSA-9) of the project site. Veneklasen assumed that all the equipment is located at the center of the project site Zone A and Zone B, as shown in Figure 5, and used simultaneously to represent worst case scenario. Figure 5 also shows the sensitive receiver locations surrounding the project site.

The maximum predicted hourly average noise levels at these sensitive receptors due to construction operations are shown in Table 11 below.

Table 11 – Construction Noise Levels at the Sensitive Receivers

Receptor	Construction Noise Level at the Boundaries of Sensitive Receivers, Leq dBA											
	NVSR 1	NVSR 2	NVSR 3	NVSR 4	NVSR 5	NVSR 6	NVSR 7	NVSR 8	NVSR 9	NVSR 10	NVSR 11	NVSR 12
Site Preparation	81	75	76	74	72	72	76	80	78	79	79	76
Grading	80	74	75	73	71	71	75	79	76	78	78	75
Building Construction	77	71	72	69	68	68	72	76	74	75	75	72
Architectural Coating	--	--	--	--	--	--	--	--	--	--	--	--
Paving	80	74	75	72	70	71	75	78	76	78	77	74

Figure 5 – Noise Sensitive Receptor Locations



According to the provided equipment list, the construction maximum noise level at NVSR 1 during the site preparation, grading and paving phase is 80-81 dBA. According to the City Noise Regulation, there is no decibel criterion for construction noise, and the activities are controlled by limiting the hours of the day for construction. Therefore, for the general compatibility of surrounding sensitive receivers, these activities should be scheduled to limit the number of heavy construction machines operating simultaneously.

Mitigation 3. The impact is less than significant with mitigation. The following measures are identified to reduce the potential effects of construction noise on adjacent properties.

- Limit construction activity to the hours listed in Table 5 (7:00 am to 8:00 pm Monday through Friday and 8:00am to 5:00 pm Saturday and Sundays).

Additional recommendations:

- Schedule highest noise-generating activity and construction activity away from noise-sensitive land uses.
- Equip internal combustion engine-driven equipment with original factory (or equivalent) intake and exhaust mufflers which are maintained in good condition.
- Prohibit and post signs prohibiting unnecessary idling of internal combustion engines.
- Locate all stationary noise-generating equipment such as air compressors and portable generators as far as practicable from noise-sensitive land uses.
- Utilize "quiet" air compressors and other stationary equipment where feasible and available.
- Designate a noise disturbance coordinator who would respond to neighborhood complaints about construction noise by determining the cause of the noise complaints and require implementation of reasonable measures to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site.

3.3 Impact 2. Excessive ground-borne vibration

Would the project result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

Construction equipment associated with building the project would be the only vibration-generating source introduced by the project, as there are no vibration sources from operations that will introduce vibration into the environment. Vibration generated by construction equipment, unless specified otherwise through permitting, would only occur during approved work hours in the City of Sebastopol, 7:00 am to 8:00 pm Monday through Friday and 8:00 am to 5:00 pm Saturday and Sunday.

Table 12 below shows the construction equipment proposed by the project planning group and the typical vibration levels generated during operation. It is understood that for this project, pile drivers will not be used. The vibration levels for some of the equipment used in the construction phase are unavailable, and Veneklasen utilized the vibration levels of similar equipment for the analysis.

Table 12 –Vibration Levels (PPV in./sec.) of Typical Construction Equipment at 25 ft.

Equipment	Reference PPV at 25 ft. in/sec
Vibratory roller	0.21
Large bulldozer	0.089

Equipment	Reference PPV at 25 ft. in/sec
Caisson drilling	0.089
Loaded trucks	0.076
Small bulldozer	0.003

Source: Federal Transit Administration (except Hanson 2001 for Vibratory rollers), 1995.

The predicted vibration levels of the proposed construction equipment at the sensitive receivers are shown in Table 13. Based on the above results construction equipment vibration levels at the sensitive receivers will not exceed the criteria per Section 2.4 shown in Table 5. Therefore, the impact is less than significant, and no mitigation is required.

Table 13 – Construction Vibration Levels at the Sensitive Receivers

Receptor	Construction Vibration Level at Sensitive Receivers, PPV, in./sec.											
	NVSR 1	NVSR 2	NVSR 3	NVSR 4	NVSR 5	NVSR 6	NVSR 7	NVSR 8	NVSR 9	NVSR 10	NVSR 11	NVSR 12
Site Preparation	0.001	0.0003	0.0004	0.0002	0.0002	0.0002	0.0003	0.0004	0.0005	0.0006	0.0006	0.0004
Grading	0.014	0.005	0.006	0.004	0.003	0.003	0.006	0.110	0.007	0.010	0.009	0.005
Building Construction	0.006	0.002	0.002	0.002	0.001	0.001	0.003	0.005	0.003	0.004	0.004	0.002
Architectural Coating	--	--	--	--	--	--	--	--	--	--	--	--
Paving	0.016	0.006	0.007	0.004	0.003	0.004	0.007	0.013	0.009	0.011	0.011	0.006

3.4 Impact 3. Airport noise exposure

For a project located within 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?

The project is not within two miles of a public airport or public use airport. Therefore, there is no noise impact.

4.0 SUMMARY

4.1 Summary of significance of impacts

	CEQA Noise Impact Question	No Impact	Less Than Significant	Less Than Significant with Mitigation	Potentially Significant
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 applicable standards of other agencies.			**X**	
2	Generation of excessive ground-borne vibration or ground-borne noise levels.	**X**			
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	**X**			

4.2 Summary of Mitigation Measures

Mitigation 1. Provide STC 28 rated glazing for windows and doors for the Zone A area, as marked in Figure 3, to meet the criteria mentioned in Table 5. With the above mitigation, the impact is less than significant.

Mitigation 2: For outdoor condensing and mechanical units directly adjacent to noise-sensitive receptors, provide a solid barrier with a height blocking line-of-sight to the nearby noise-sensitive receptors. The minimum density of the barrier shall be 2 lbs./sq. ft with no holes or gaps. Once final equipment selection is made, an acoustical analysis of the noise from project mechanical and electrical equipment to surrounding properties must be completed by a qualified acoustical consultant prior to final design to verify compliance with the City's Exterior Noise Standards.

Mitigation 3. The impact is less than significant with mitigation. The following measures are identified to reduce the potential effects of construction noise on adjacent properties.

- Limit construction activity to the hours listed in Table 5 (7:00 am to 8:00 pm Monday through Friday and 8:00am to 5:00 pm Saturday and Sundays).

We trust this meets the project's needs. If you have any questions, please do not hesitate to call.

Sincerely,
Veneklasen Associates, Inc.

Elias Montoya
Associate

Sanath Hapuarachchi
Associate

APPENDIX A

Table A.1 – Definitions of Noise-Related Terms

Term	Definition
Decibel, dB	A unit describing the amplitude of sound equivalent to 20 times the logarithm, to the base 10, of the ratio of the pressure of the sound to the reference pressure of 20 µPa.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured in an A-weighting filter network. The A-weighting de-emphasizes the very low frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are in the A-weighted scale.
L_0 (L_{max}), L_2, L_8, L_{25}, L_{50}	The A-weighted noise levels that are exceeded 0 percent (maximum noise level), 2 percent, 8 percent, 25 percent, and 50 percent of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the stated measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 P.M. to 10:00 P.M., and after addition of 10 decibels to noise levels in the night between 10:00 P.M. and 7:00 A.M.
Day-Night Noise Level, DNL, Ldn	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 P.M. and 7:00 A.M.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Impulsive Noise	Sound of short duration. Typically associated with an abrupt onset and rapid decay (i.e., gun-shots, etc.).
Pure Tones	A sound wave, residing over a small range of frequencies, which has a sinusoidal behavior over time.
VdB	Unit of measurement used by FHWA to describe ground-borne vibration. Equivalent to 20 times the logarithm, to the base 10, of the ratio of the root mean square ground-borne velocity to the reference of reference of $1x10^{-6}$ in/sec.

APPENDIX B

Traffic Noise Modeling Parameters

Table 1 – Trip Generation Summary

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Single Family (Attached)	80 du	7.20	576	0.48	38	10	28	0.57	46	27	19
Multifamily Housing	16 du	6.74	108	0.40	6	2	4	0.51	8	5	3
Total			**684**		**44**	**12**	**32**		**54**	**32**	**22**

Note: du = dwelling unit

Table 2 – Trip Distribution Assumptions

Route	Percent	Daily Trips	AM Trips	PM Trips
Occidental Road (to/from the east)	20%	137	9	11
Occidental Road (to/from the west)	5%	34	2	3
SR 116 (to/from the north)	10%	68	4	5
SR 116 (to/from the south)	40%	275	18	22
Mill Station Road (to/from the west)	5%	34	2	3
Covert Lane (to/from the west)	10%	68	4	5
N. Main Street (to/from the north)	10%	68	4	5
TOTAL	**100%**	**684**	**44**	**54**

Source:.W-trans, Memorandum of Assumptions for The City Ventures Canopy Traffic Study

AADT Traffic Counts Year 2020

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	DISTRICT	ROUTE	RTE_SFX	COUNTY	PM_PFX	PM	PM_SFX	DESCRIPTION	BACK_PEAK_HOUR	BACK_PEAK_MADT	BACK_AADT	HEAD_PEAK_HOUR	HEAD_PEAK_MADT	AHEAD_AADT		
4871	04	116		SON		0.000		JCT. RTE. 1				500	3400	2700		
4872	04	116		SON		4.927		AUSTIN CREEK	1100	6900	5600	1000	6200	5000		
4873	04	116		SON		11.164		GUERNEWOOD PARK, HULBERT CREEK BRIDGE	1300	13100	11200	1300	13100	11200		
4874	04	116		SON		7.780		MONTE RIO (TOWN CENTER)/BOHEMIAN HWY	1000	9500	8200	1300	12900	11000		
4875	04	116		SON	R	12.067		GUERNEVILLE, ARMSTRONG WOODS ROAD	1300	11100	10300	1500	8100	7400		
4876	04	116		SON		14.050		SANTA NELLA WINERY/ODD FELLOWS ROAD	300	3100	2900	300	2800	2500		
4877	04	116		SON		19.390		FORESTVILLE, MIRABEL ROAD	1300	11700	10200	1300	11400	11100		
4878	04	116		SON		21.800		GUERNEVILLE ROAD	1200	11500	10900	1200	10600	10300		
4879	04	116		SON		23.050		GRATON/FREI ROADS	1600	13500	13200	2100	17300	16900		
4880	04	116		SON	R	24.054		OCCIDENTAL/MOLINO ROADS	2500	21800	21400	1700	17100	16700		
4881	04	116		SON		25.690		SEBASTOPOL, COVERT LANE	2000	19900	19500	2100	22100	21700		
4882	04	116		SON		26.510		SEBASTOPOL, MAIN ST	2100	22100	21700	2500	27000	26500		
4883	04	116		SON	R	26.650	R	BEGIN RIGHT ALIGN	2700	29000	28400	1400	13900	13600		
4884	04	116		SON	R	26.733	R	SEBASTOPOL, JCT. RTE. 12 EAST	1400	13900	13600	1200	12600	12000		
4885	04	116		SON	R	27.200	R	SEBASTOPOL, PALM AVE	1200	12600	12000	1100	12400	11800		
4886	04	116		SON	R	27.300	R	SEBASTOPOL, PETALUMA AVE	1100	12400	11400					
4887	04	116		SON	R	26.650	L	SEBASTOPOL, ON MAIN ST				1200	12800	12200		
4888	04	116		SON	R	26.820	L	SEBASTOPOL, JCT. RTE. 12	1200	13000	12400	1200	13300	12600		
4889	04	116		SON	R	27.320	L	SEBASTOPOL, PALM AVE	1200	13300	12600					
4890	04	116		SON		27.300		SEBASTOPOL, PETALUMA AVE				2200	24700	23700		
4891	04	116		SON		28.560		BLOOMFIELD ROAD	2200	24700	23700	1600	17500	16800		
4892	04	116		SON		30.330		CUNNINGHAM, LONE PINE ROAD	1600	17500	16800	1600	17500	16800		
4893	04	116		SON		33.610		STONY POINT ROAD EAST	1500	16700	16000	1200	12800	11600		
4894	04	116		SON		35.030		PETALUMA, JCT. RTE. 101	1600	18400	17700					
4895	04	116		SON		35.040		PETALUMA, JCT. RTE. 101				2600	23000	22500		
4896	04	116		SON		36.360		FRATES ROAD/CADER LANE	2400	21900	21400	1800	18700	17500		
4897	04	116		SON		39.270		LAKEVILLE ROAD	1800	18700	17500	2100	21200	19700		
4898	04	116		SON		41.810		ADOBE ROAD	2100	21200	19700	2100	22900	21900		
4899	04	116		SON		44.200		WATMAUGH ROAD	2100	22900	21900	2000	20800	19700		
4900	04	116		SON		44.840		ARNOLD DR	2000	20800	19700	1800	20400	17500		
4901	04	116		SON		46.755		JCT. RTE. 121	1800	18400	17500					
7116																

Source: Caltrans website

AADT Traffic Counts Year 2013

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
4864	Dist	Route		County		Postmile		Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak AADT	Ahead AADT
4865	11	115		IMP		21.18		JCT. RTE. 78	210	2300	1950	130	1300	1100
4866	11	115		IMP		25.99		RUTHERFORD ROAD	130	1300	1100	110	1100	1000
4867	11	115		IMP		30.086		ALBRIGHT ROAD	110	1100	1000	110	1050	960
4868	11	115		IMP		31.63		WIRT ROAD	110	1050	960	110	1000	880
4869	11	115		IMP		34.517		EAST AVENUE	110	1000	880	230	2300	2150
4870	11	115		IMP		34.882		INDUSTRIAL AVENUE	230	2300	2150	420	4500	4150
4871	11	115		IMP		34.964		RAILROAD AVENUE	420	4500	4150	390	3800	3600
4872	11	115		IMP		35.235		CALIPATRIA, JCT. RTE. 111	390	3800	3600			
4873	4	116		SON		0		JCT. RTE. 1, JENNER, SOUTH				410	2850	2150
4874	4	116		SON		4.927		AUSTIN CREEK	490	5200	4150	440	4600	3650
4875	4	116		SON		7.78		MONTE RIO (TOWN CENTER)/BOHEMIAN HWY	670	7500	6100	890	10000	8100
4876	4	116		SON		11.164		GUERNEWOOD PARK, HULBERT CREEK BRIDGE	910	10300	8300	910	10300	8300
4877	4	116		SON	R	12.067		GUERNEVILLE, ARMSTRONG WOODS ROAD	1200	13400	10800	870	9800	7900
4878	4	116		SON		14.05		SANTA NELLA WINERY/ODD FELLOWS ROAD	330	3700	3000	360	3300	2600
4879	4	116		SON		19.39		FORESTVILLE, MIRABEL ROAD	470	4950	4650	1100	11600	10900
4880	4	116		SON		21.8		GUERNEVILLE ROAD	1200	12300	11600	1000	10600	10000
4881	4	116		SON		23.05		GRATON/FREI ROADS	1300	13600	12800	1700	17600	16600
4882	4	116		SON	R	24.054		OCCIDENTAL/MOLINO ROADS	1950	22300	21000	1550	17400	16400
4883	4	116		SON		25.69		SEBASTOPOL, COVERT LANE	1800	20300	19100	2000	22600	21300
4884	4	116		SON		26.51		SEBASTOPOL, MAIN STREET	2000	22500	21300	2450	27500	26000
4885	4	116		SON	R	26.65	R	BEGIN RIGHT ALIGN	2450	27500	26000	1250	14400	13300
4886	4	116		SON	R	26.733	R	SEBASTOPOL, JCT. RTE. 12 EAST	1250	14400	13300	1150	13200	12200
4887	4	116		SON	R	27.2	R	SEBASTOPOL, PALM AVENUE	1200	13900	12900	1150	13000	12000
4888	4	116		SON	R	26.65	L	SEBASTOPOL, ON MAIN STREET	2450	27500	26000	1150	13200	12200
4889	4	116		SON	R	26.82	L	SEBASTOPOL, JCT RTE 12	1150	13000	12500	1150	12900	12300
4890	4	116		SON	R	27.32	L	SEBASTOPOL, PALM AVE	1150	12900	12300	2250	25000	24000
4891	4	116		SON		27.3		SEBASTOPOL, PETALUMA AVENUE	2250	25000	24000	2250	25000	24000
4892	4	116		SON		28.56		BLOOMFIELD ROAD	1800	19900	19200	1550	17100	16500
4893	4	116		SON		30.33		CUNNINGHAM, LONE PINE ROAD	1400	15500	15000	1550	17100	16500
4894	4	116		SON		33.61		STONY POINT ROAD EAST	1550	17300	16700	1250	14200	13700
4895	4	116		SON		35.03		PETALUMA, JCT. RTE. 101	1900	21100	20400	3150	38000	37000

Source: Caltrans website

FHWA Traffic Noise Prédiction Model Predicted Future noie Level Location L1

FHWA Traffic Noise Prediction Model

	Cars	Medium Trucks	Heavy Trucks	TOTAL
Day	46.9	39.7	41.1	48.5
Evening	45.1	33.4	32.0	45.6
Night	39.1	31.9	33.3	40.7
CNEL	48.3	40.5	41.8	49.7
LDN	47.7	40.3	41.6	49.3

FHWA Traffic Noise Prédiction Model Predicted Future noie Level Location L2

FHWA Traffic Noise Prediction Model

	Cars	Medium Trucks	Heavy Trucks	TOTAL
Day	55.4	48.3	49.6	57.1
Evening	53.7	41.9	40.6	54.1
Night	47.6	40.4	41.8	49.2
CNEL	56.8	49.1	50.3	58.3
LDN	56.2	48.8	50.2	57.8

APPENDIX C

In order to meet the predicted interior noise levels described in Section 3.2.3, the glazing shall meet the following requirements:

Table 14 – Acoustical Glazing Requirements: Minimum Octave Band Transmission Loss and STC Rating

Nominal Thickness	Minimum Transmission Loss Octave Band Center Frequency (Hz)						Min. STC Rating
	125	250	500	1000	2000	4000	
1" dual	21	18	24	32	36	31	**28**

The transmission loss values in the table above can likely be met with the following glazing assemblies:

- Up to STC 35: nominal 1" insulated glazing unit

An assembly's frame and seals may limit the performance of the overall system. Therefore, the window and door systems selected for the project shall not be selected on the basis of the STC rating of the glass alone, but on the entire assembly including frame and seals. Additionally, the assemblies given above are provided as a basis of design, but regardless of construction, the octave band Transmission Loss (TL) and STC value of the system selected must meet the minimum values in Table 14 above.

Independent laboratory acoustical test reports should be submitted for review by the design team to ensure compliance with glazing acoustical performance requirements. Laboratories shall be accredited by the Department of Commerce National Voluntary Laboratory Accreditation Program (NVLAP). Labs shall be pre-approved by Veneklasen Associates. Tests shall be required to be performed in North America. Lab tests and lab reports shall be in compliance with ASTM standard E90 and be no more than 10 years old from the date of submission for this project.

If test reports are not available for a proposed assembly, the assembly, including frame, seals and hardware, shall be tested at an independent pre-approved NVLAP-accredited laboratory to demonstrate compliance with the requirements of this report. Veneklasen shall be invited to witness acoustical testing completed and reserves the right to exclude test reports from laboratories that are not pre-approved by Veneklasen

Appendix J

Noise Calculations

Construction Noise

Distance	Noise Level @ 50 ft	Single Family Residential on Winona Lane	Single Family Residential on Hurlbut Avenue	Sebastopol Charter School
Distance		130	160	250
Demolition	76	67.701	65.897	62.021
Site Preparation	84	75.701	73.897	70.021
Grading	84	75.701	73.897	70.021
Building Construction	77	68.701	66.897	63.021
Architectural Coating	77	68.701	66.897	63.021

Distance	Noise Level @ 50 ft	Single Family Residential on Winona Lane	Single Family Residential on Hurlbut Avenue	Sebastopol Charter School
Distance		125	280	250
Paving	84	76.041	69.036	70.021

Construction Vibration

Equipment	Vibration @ 25 ft	Single Family Residential on Winona Lane	Single Family Residential on Hurlbut Avenue	Commercial to the South
		60	40	35
Vibratory Roller	0.21	0.056	0.104	0.127
Large Bulldozer	0.089	0.024	0.044	0.054
Loaded Trucks	0.076	0.020	0.038	0.046
Small Bulldozer	0.003	0.001	0.001	0.002

The Canopy

Final Environmental Impact Report/ Responses to Comments on the Draft EIR

SCH#2023070072

prepared by

The City of Sebastopol
Planning Department
7120 Bodega Avenue
Sebastopol, California 95472
Contact: John Jay, Associate Planner, Planning Department

prepared with the assistance of

Rincon Consultants, Inc.
449 15th Street, Suite 303
Oakland, California 94612

February 2024

RINCON CONSULTANTS, INC. SINCE 1994

Table of Contents

Appendices

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1 Introduction

1.1 Purpose of the Final EIR

This document is the Final EIR which contains responses to comments received on the Draft Environmental Impact Report (Draft EIR) and revisions to the Draft EIR prepared for The Canopy Project (project). The Draft EIR identifies the likely environmental consequences associated with development facilitated by the proposed project and recommends mitigation measures to reduce potentially significant impacts.

1.2 Environmental Review Process

Pursuant to the California Environmental Quality Act (CEQA), lead agencies are required to consult with public agencies having jurisdiction over a proposed project and to provide the general public with an opportunity to comment on the Draft EIR.

The City of Sebastopol distributed a Notice of Preparation (NOP) of the Program EIR for a 30-day agency and public review period commencing July 6, 2023 to August 7, 2023. In addition, the City held a virtual Scoping Meeting on July 18, 2023. The meeting, held at 3:00 PM, was aimed at providing information about the proposed project to members of public agencies, interested stakeholders and residents/community members. The meeting was held at Sebastopol Community Center at 425 Morris Street, Sebastopol, CA and online via Zoom. The City received letters from two agencies in response to the NOP during the public review period, as well as various verbal comments during the EIR Scoping Meeting.

The Draft EIR was made available for public review for a 48-day public review period that began on December 7, 2023 and ended on January 24, 2024. The Notice of Availability of a Draft EIR was posted with the County Clerk, sent to the State Clearinghouse, mailed to local and state agencies, published in the newspaper, and emailed to interested parties. In addition, the Planning Commission received verbal comments on the Draft EIR during the public meeting held on January 23, 2024.

The City received 13 individual written comments on the Draft EIR and one written memo of comments received verbally via phone call. Copies of written comments received during the comment period are included in Chapter 2 of this document and comments received during the public meeting are included in Chapter 3 of this document.

1.3 Document Organization

This document consists of the following chapters:

- **Chapter 1: Introduction.** This chapter discusses the purpose and organization of this Final EIR and summarizes the environmental review process for the project.
- **Chapter 2. Written Comments and Responses.** This chapter contains reproductions of all comment letters received on the Draft EIR. A written response for each CEQA-related written comment received during the public review period is provided. Each response is keyed to the corresponding comment.

- **Chapter 3: Public Hearing Comments and Responses.** This chapter contains a summary of comments received during the public meeting held on January 23, 2024.
- **Chapter 4: Revisions to the Draft EIR.** Changes to the Draft EIR that have been made in light of the comments received are contained in this chapter.

1.4 EIR Certification Process and Project Approval

Before adopting the proposed project, the lead agency is required to certify that the EIR has been completed in compliance with CEQA, that the decision-making body reviewed and considered the information in the EIR, and that the EIR reflects the independent judgment of the lead agency.

Upon certification of an EIR, the lead agency makes a decision on the project analyzed in the EIR. A lead agency may: (a) disapprove a project because of its significant environmental effects; (b) require changes to a project to reduce or avoid significant environmental effects; or (c) approve a project despite its significant environmental effects, if the proper findings and statement of overriding considerations are adopted (*CEQA Guidelines* Sections 15042 and 15043).

In approving a project, for each significant impact of the project identified in the EIR, the lead or responsible agency must find, based on substantial evidence, that either: (a) the project has been changed to avoid or substantially reduce the magnitude of the impact; (b) changes to the project are within another agency's jurisdiction and such changes have or should be adopted; or (c) specific economic, social, or other considerations make the mitigation measures or project alternatives infeasible (*CEQA Guidelines* Section 15091). Pursuant to PRC Section 21061.1, feasible means capable of being accomplished in a successful manner within a reasonable period of time, taking into account, economic, environmental, legal, social, and technological factors.

If an agency approves a project with unavoidable significant environmental effects, it must prepare a written Statement of Overriding Considerations that sets forth the specific social, economic, or other reasons supporting the agency's decision and explains why the project's benefits outweigh the significant environmental effects (*CEQA Guidelines* Section 15093).

When an agency makes findings on significant effects identified in the EIR, it must adopt a reporting or monitoring program for mitigation measures that were adopted or made conditions of project approval to mitigate significant effects (*CEQA Guidelines* Section 15091[d]).

1.5 Draft EIR Recirculation Not Required

CEQA Guidelines Section 15088.5 requires Draft EIR recirculation when comments on the Draft EIR or responses thereto identify "significant new information." Significant new information is defined as including:

1. A new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented.
2. A substantial increase in the severity of an environmental impact would result unless mitigation measures are adopted that reduce the impact to a level of insignificance.
3. A feasible project alternative or mitigation measure considerably different from others previously analyzed would clearly lessen the significant environmental impacts of the project, but the project's proponents decline to adopt it.

4. The draft EIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded.

The comments, responses, and Draft EIR revisions presented in this document do not constitute such “significant new information;” instead, they clarify, amplify, or make insignificant modifications to the Draft EIR. For example, none of the comments, responses, and Draft EIR revisions disclose new or substantially more severe significant environmental effects of the proposed project, or new feasible mitigation measures or alternatives considerably different than those analyzed in the Draft EIR that would clearly lessen the proposed project’s significant effects.

2 Responses to Comments on the Draft EIR

This section includes comments received during public circulation of the Draft Environmental Impact Report (EIR) prepared for The Canopy Project (Project).

The Draft EIR was circulated for a 48-day public review period that began on December 7, 2023 and ended on January 24, 2024. The City of Sebastopol received 13 written comment letters on the Draft EIR and one memo summarizing verbal comments received via phone call. The commenters and the page number on which each commenter's letter appear are listed below.

Letter No. and Commenter		Agency	Page No.
Public Comment			
1	Linda Berg		5
2	Tor Allen		7
3	Joan Schwan and Geoffrey Skinner		10
4	Paul Fritz		21
5	Seth Hanley		27
6	Tennis Wick	Permit Sonoma	33
7	Dave Kereazis	Department of Toxic Substances Control (DTSC)	38
8	Linda Berg		44
9	Janet Waring		47
10	Sandy Mathews		50
11	Jacob Harris		52
12	Kate Haug		56
13	Kathy Oetinger		58
14	Yunsheng Luo	California Department of Transportation (Caltrans)	61

The comment letters and responses follow. The comment letters are numbered sequentially and each separate issue raised by the commenter, if more than one, has been assigned a number. The responses to each comment identify first the number of the comment letter, and then the number assigned to each issue (Response 1.1, for example, indicates that the response is for the first issue raised in Comment Letter 1).

Where a comment resulted in a change to the Draft EIR text, a notation is made in the response indicating that the text is revised. Changes in text are signified by strikeout font (~~strikeout font~~) where text was removed and by underlined font (<u>underlined font</u>) where text was added. These changes in text are also included in Section 4, *Revisions to the Draft EIR*.

City of Sebastopol
Planning Department

December 20, 2023

To: Katie Green, Rincon Consultants

Re: Canopy Draft EIR public comments.

Hello Katie,

I received a phone call from Linda Berg on December 18th, 2023 and her comments are listed below for the project.

- How and why is there no significant impact to traffic and emergency services from this project.
- How are they estimating only 684 trips per day for this project. 1.1
- Adding vehicles to the Healdsburg corridor is not a good idea.
- Why is the cumulative congestion used and does this account for the new 22 units proposed at 845 Gravenstein Highway North.

Sincerely,

John Jay, Associate Planner
jjay@cityofsebastopol.gov

Letter 1

COMMENTER: Linda Berg

DATE: December 18, 2023

Response 1.1

The commenter asks how less than significant traffic and emergency services impacts were determined, how trips per day were estimated, and why cumulative congestion is used in the analysis, and whether it accounts for 22 new units proposed at 845 Gravenstein Highway North. The commenter also opines that adding vehicles to the Healdsburg corridor is not a good idea.

Transportation and emergency service impacts are discussed in Section 4.13, *Transportation*, of the Draft EIR. As described on Page 4.13-14 of the Draft EIR, the proposed internal network and the parking stalls located therein were determined to be in accordance with City design standards. Site access and circulation were determined to function acceptably for emergency response vehicles. Furthermore, analysis on Page 4.13-14 of the Draft EIR determined that the increase in traffic volumes resulting from the project can reasonably be expected to result in similarly nominal changes to traffic delays in the area. Since emergency responders can claim the right-of-way through use of their lights and sirens, the addition of project-generated traffic would be expected to have little to no impact on emergency response times. Therefore, the project would have a less than significant impact on emergency response.

Impacts related to vehicle miles traveled (VMT) and hazards related to geometric design features were also determined to be less than significant. Furthermore, as described in Section 4.12-7, *Public Services*, pursuant to Chapters 3.34 and 3.38 of the Sebastopol Municipal Code (SMC), the project would be required to pay fees that would be used to support Sebastopol Fire Department operations and the provision of additional resources and staff at the Sebastopol Police Department's police station and impacts to public services such as emergency services would be less than significant.

While not required by CEQA, trips per day and level of service (LOS) analysis is provided in Appendix TRA to the Draft EIR. Calculations used to determined trips per day are provided in Appendix B of Appendix TRA. Cumulative impacts regarding consistency with existing plans and programs related to pedestrian, transit, and roadway policies, and vehicle miles traveled (VMT) impacts are discussed on pages 4.13-14 through 4.13-15 of the Draft EIR. As stated therein, with respect to cumulative impacts, the OPR Technical Advisory states, "A project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact." The proposed project would contribute to this cumulative impact by adding to countywide VMT alongside other planned development nearby. However, as described under Impact TRA-2, the implementation of the project would not significantly increase the City's VMT. Therefore, the Draft EIR determined that the project would not result in a cumulatively considerable contribution to significant cumulative VMT impacts. As shown on Page 3-2 of the Draft EIR, the proposed 845 Gravenstein Hwy North project mentioned by the commenter was included in the cumulative projects list considered for cumulative analysis.

John Jay

From: Tor Allen <tor@rahus.org>
Sent: Monday, January 8, 2024 9:23 PM
To: John Jay; Kari Svanstrom
Cc: Steven Pierce
Subject: Observation @ Canopy Project.... solar related

Hi John, Kari,
I was just reviewing the Draft EIR for the Canopy project
https://www.cityofsebastopol.gov/wp-content/uploads/2023/12/Canopy-DEIR-with-Appendices.pdf

I wanted to share 2 observations regarding this development for consideration.
1. pg. 46, front facade of the building. shows an architectural roof 'feature' that renders much of the solar viable roof space unusable or not ideal. the architecture 'feature' is just that - it's something the architect thinks makes the building look better. I'm hoping that this can be modified such that the south and west facing roof space can be maximized for solar array placement. One would think that by now architects that claim their development is 'solar' would at least make an attempt at optimizing the roof. Title 24 solar requires a bare minimum solar array size. One should really design a solar array that allows for adding modules if a homeowner wishes, beyond the bare minimum that the developer will install initially. 2.1

Figure 2-5 Proposed Building Elevations

Source: William Hezmalhalch Architects, INC. DBA WHA, 2023

2. roof vents - while this report might not show this detail, it's important. One can reference Barlow Crossing for how NOT to do it. All vents can be placed on the north or east side of the roof leaving the south and west facing roof space free of obstructions. It's really not that hard to do. Habitat for Humanity projects know how to do this, so ... 2.2

3. require a Battery per unit. With the change in Net Metering law, dramatically lowering the value of any exported solar electrons to the grid, new residential solar systems are considered incomplete without a battery to help store energy for use during peak afternoon/evening periods - especially with an all electric home. City of Sebastopol is allowing a waiver for this project for the 3 story height. Perhaps it can require an appropriate sized battery as well? 2.3

Thanks!

Tor

--

Tor Allen
The Rahus Institute rahus.org
Solar Schoolhouse solarschoolhouse.org
Sebastopol Carbon Conversations
rahus.org/scc
Sebastopol, California
ph: 707-829-3154 fax:707-827-8361
tor@rahus.org

Letter 2

COMMENTER: Tor Allen

DATE: January 8, 2024

Response 2.1

The commenter suggests that an architectural roof feature shown in Figure 2-5 of the EIR could be modified to optimize future use of solar panels.

The comment has been noted and passed to decisionmakers. This comment does not relate to the adequacy of the EIR, but rather comments about design features on the project chosen for analysis.

Response 2.2

The commenter recommends placing roof vents on the north or east side of the roof.

The comment has been noted and passed to decisionmakers. This comment does not relate to the adequacy of the EIR, but rather comments about design features on the project chosen for analysis.

Response 2.3

The commenter recommends requiring a battery unit.

The comment has been noted and passed to decisionmakers. This comment does not relate to the adequacy of the EIR, but rather comments about design features on the project chosen for analysis.

John Jay

From: John Jay
Sent: Tuesday, January 9, 2024 10:24 AM
To: John Jay
Subject: FW: Comments on "The Canopy" proposed development

Hello Kari,

Please share our comments below with the Planning Commission members. Thank you!

Dear Planning Commission members,

We live on Hurlbut Avenue and would like to offer input on the proposed high-density housing development in our neighborhood. We generally support providing housing on appropriate sites where equitable housing opportunities are needed, but this project appears primarily aimed at a specific higher-end market, with no units fewer than three bedrooms and few below-market units. The project as proposed is out of character with the neighborhood in terms of density and scale. We would like to see reduced housing density, reduced building height, confirmation that there will not be impacts on groundwater supply, and a solid plan for mitigating the impacts of lost native oak trees. Following are our additional comments and questions. Thank you for your consideration. 3.1

Trees:

- The biological section of the CEQA document indicates that 41 native trees are being removed. Please clarify the plan for mitigating those losses. If it will be off-site, is the City confident that $75 is adequate to purchase, plant, and maintain through establishment trees of similar value to those that are being removed? Where will these be planted? Would the trees be replaced in kind (i.e., native oaks for native oaks), or would they more likely be small street trees such as crape myrtles or ornamental pears, which provide much reduced biological and shade values? 3.2
- Will project grading (cut and/or fill) and soil capping have any negative impact on trees to be preserved? The root protection zone for native trees is typically considered to extend 1.5 times the width of the canopy; grading within that zone often leads to tree loss. If additional trees will be impacted by grading, they should be included in the count of trees lost and mitigated for. 3.3
- The plan indicates that one of the few mature oaks to be protected within the site will be permanently lit with multiple lanterns. Please consider omitting that lighting as it would reduce the habitat value of the heritage oak for birds and other wildlife, as well as contribute to light pollution. 3.4
- The project description notes that native trees will be used for landscaping, and mentions maple, dogwood, and madrone. Madrone is appropriate for the site. Big-leaf maple is a riparian tree (needing significant water) and we suggest it be replaced with black or Oregon oak, which are drought-tolerant and would occur naturally on the site. Dogwood is also a riparian tree/shrub not suitable for this site without ongoing irrigation; we suggest it be removed from the palette. Many of the shrubs and perennials listed are native, drought-tolerant, and appropriate to the site. The plant palette also lists birch, which is not native and requires high water input; we suggest that species be removed. Plans appear to call for turf grass around one of the preserved heritage oaks; summer irrigation can kill native oaks, so lawns should be avoided within the oaks' root protection zone. 3.5

Wildlife:

- The biology report does not address current wildlife use of the site and lacks a list of wildlife species observed on-site during the assessment. We live in a similar nearby setting of an aging apple orchard with scattered oak trees and know that this setting is heavily used by many bird, bee, and butterfly species, as well as deer, foxes, coyotes, and other native 3.6

wildlife. With urbanization expanding across our town, state, and globe, protecting remnant habitat elements within urban areas is increasingly essential for wildlife to persist.

- The report indicates that the site has no value for wildlife movement, and suggests that it is surrounded by commercial and residential development. We see it differently; the site is bounded by the corridor of the regional trail on one side, which provides a narrow but valuable strip of largely native oak habitat stretching from the edge of town through town, to the Laguna. Currently, from a wildlife perspective, the site serves as a portion of that corridor. We have seen deer and foxes use the nearby path as a movement corridor and many birds nesting along it. In recent years, a bear was observed on the O'Reilly property and used the path as a movement corridor as evidenced by scat. The fact that the CERES garden required a deer fence also reflects the regular use of the site by deer. 3.7
- The report doesn't mention USFWS-listed Birds of Conservation Concern likely to make use of the property, such as oak titmice. Mature oaks, and even aging apple trees, provide valuable resources in this neighborhood to titmice and other birds such as western bluebirds, swallows, northern flickers, sapsuckers, and many others. The populations of many previously common bird species have declined dramatically just since the 1960s-1970s; for example, USFWS states that the oak titmouse population across California declined by 46% from 1966 to 2010, with urban and suburban development being one of the primary causes. 3.8
- Reducing the project density to retain more native oaks and provide more space for the native shrub plantings listed on the plant palette would reduce the project's negative impact on local wildlife, supporting birds and pollinators in particular. 3.9

Traffic:

- The traffic report notes that the project would significantly impact traffic at intersections that are already failing to meet standards for service. It suggests traffic light timing adjustment as a mitigation. How much improvement in traffic impacts would result from adjusting light timing? Is that adequate to offset project traffic to less-than-significant? 3.10

Water and Energy:

- The hydrology section does not state anticipated project water demand/groundwater use during operation. What will this be? Has it been determined that this new demand will not overdraft groundwater supplies? Does the analysis consider climate change? Please provide information on this analysis.
- The cumulative impacts section does acknowledge that the project "would increase the water demand, which would be derived solely from groundwater sources. Cumulative development would also increase the demand for groundwater supplies. It is anticipated that cumulative development would result in a significant cumulative impact. The proposed project includes the upgrade of stormwater detention areas, which would be consistent with GSP goals for groundwater recharge, and as described under Impact HYD-2, the project would allow for a net recharge to groundwater and would not interfere with sustainable management of the groundwater basin." However, we did not find any data or rationale provided for the assertion that a net recharge to groundwater would result from the project. Please provide that information. The Santa Rosa Plain Groundwater Sustainability Plan notes that "the amount of groundwater stored in the shallow and deep aquifer systems is declining on average by about 2,100 acre-feet per year." How do the cumulative impacts envisioned by residential development address or worsen this situation? 3.11
- What portion of the project's energy use will be provided by the proposed solar panels? Does the proposed system meet Sebastopol's requirements? 3.12

Population and Housing:

- Will there be deed restrictions in place to ensure that units are not converted to short-term rentals? A significant portion of the housing in the neighborhood is already devoted to short-term rentals or second homes. We support the goal of finding housing for Californians in need, but not necessarily facilitating new development for increased vacation rentals or second homes. 3.13

Aesthetics and Noise:

- The Aesthetics section indicates that the project is surrounded by "residential and commercial land uses." This obscures the fact that much of the site borders a regional trail corridor/regional park, as well as a school site with significant open space. 3.14

Hundreds of people experience this trail corridor every day, enjoying its quiet, natural, tree-lined setting away from the urban realm, and these values should be considered in analyzing the project's impact. The dense development of 40+' tall buildings and parking immediately along the trail could change the experience of that stretch of trail from that of a wooded linear park to more of an urban sidewalk. The human health benefits of walking in natural settings are increasingly well-documented by researchers and worth protecting from incremental losses. We would like to see an increased setback from the trail, lowered building heights, and a commitment to a screen of native trees here. 3.14 cont.

- This project is proposed in the transition zone between the developed corridor of 116 and rural residential areas. Contrary to statements in the report, the proposal is not consistent with the existing residential scale of the neighborhood. Dense, extensive 40'+ tall residential buildings represent a dramatic visual change in the neighborhood. That height is consistent only with the O'Reilly buildings, and those were also out of character and highly controversial when built (and now stand underutilized). Please consider reducing the height and density of the project, particularly on the edges meeting the West County Trail, the surrounding residences, and Hurlbut.
- The noise section indicates that solid, eye-level walls will be needed to prevent significant ongoing noise impacts from equipment. Please identify these on project drawings and details. How much will existing noise in the adjacent neighborhoods be increased by the project? The report does not clearly state this. 3.15
- Plans indicate that the site will be surrounded by fencing, but the fencing is not shown on the elevation drawings or Highway 116 views. Extensive fencing has a significant impact on neighborhood views, social interactions, and aesthetics. Please provide view illustrations that include the proposed fencing, as well as the solar panels and other project infrastructure not currently shown. 3.16
- Fencing along Hurlbut Avenue is shown as 42" tall. Does this exceed the allowable fence height in Sebastopol within the setback from the road centerline?
- Will there be deed restrictions to prevent residents from installing security or other lighting that conflicts with Dark Sky guidelines? Being able to see many stars is one of the great pleasures of living here, often noted by friends and family who visit from other regions. 3.17
- We suggest omitting the art features such as fog catchers and using that space instead to incorporate native landscape plantings, helping to offset the loss of native trees and improving bird and pollinator habitat on-site while also providing a beautiful setting for residents.

In the future we hope the City is able to encourage redevelopment of existing developed but under-utilized sites, like the largely empty and neglected strip mall across 116 from the site, or the O'Reilly building itself, while protecting some remnant fragments of open space within town. 3.18

We understand that there are many considerations to weigh for the City and the Planning Commission. Thank you for including our input, and that of other project neighbors, as part of the process.

Joan Schwan and Geoffrey Skinner
1293 Hurlbut Avenue

Letter 3

COMMENTER: Joan Schwan and Geoffrey Skinner

DATE: January 9, 2024

Response 3.1

The commenter states that they would like to see reduced housing density, reduced building heights, and requests additional clarification regarding groundwater supplies and mitigation measures for native oak trees.

This comment has been passed to decisionmakers for review. Please see Response 3.11 regarding groundwater supply and Response 3.2 regarding oak tree mitigation measures.

Response 3.2

The commenter requests clarification regarding mitigation measures for trees that would be removed on the project site including where new trees will be planted, and what types of trees would be planted.

Impacts to trees protected by the City's Municipal Code are discussed in Section 4.3.3. As described therein, the project applicant would be required to comply with the Sebastopol Municipal Code Chapter 8.12, Tree Protection, which would include a review of tree removal plans, landscape plans, and specification of a tree replacement ratio by the Planning staff or the City Arborist during the project design review. Pending approval, removed protected trees must be replaced with an approved tree species on the approved tree List, as described in Mitigation Measure BIO-2 on Page 4.3-17 of the Draft EIR. The project proposes planting replacement trees on site, including big leaf maple, madrone, sycamore, and California bay. Through approval of the tree removal permit and corresponding tree mitigation requirements, the project would not conflict with local policies or ordinances regarding trees. The biological value of replacement trees is not evaluated, or required, under this threshold.

An updated Tree Impact Summary by Horticultural Associates was provided on January 23, 2024 and will be available as an appendix to the Final EIR. A total of 43 on-site trees will be removed, including 29 protected trees. Mitigation Measure BIO-2 would continue to apply. With implementation of Mitigation Measure BIO-2, impacts would be reduced to less than significant. The information contained within the Draft EIR, in conjunction with the updated Tree Impact Summary that is provided in the Final EIR, would not constitute the addition of substantial new information and would not require recirculation of the Draft EIR.

Page ES-3 of the Draft EIR has revised with the following (changes shown in strikeout/underline):

There are currently ~~133~~134 trees within the project site (including 92 protected trees), and the proposed project would involve the removal of ~~22~~43 trees (including 29 protected trees) while preserving the remaining ~~111~~91 trees (including 63 protected trees) primarily along the perimeter of the site. An existing large, mature coast live oak tree would be retained at the primary entrance to the project entry. Existing oak trees and redwoods would be preserved throughout the site. Additional trees, such as native maples, madrone and dogwood, are proposed to create onsite ecosystems that attract birds and butterflies. Proposed landscaping would include new plantings throughout the open spaces, including the paseo, at the setbacks along drive aisles, roadways, and streets, and surrounding the proposed buildings. Other amenities, including gardens, active and passive seating areas, children's play areas, and a meditation hammock garden are also proposed.

Response 3.3

The commenter asks if any trees to be protected, or their root systems, would be affected by project grading.

A Tree Protection Plan prepared for the proposed project is discussed in Section 4.3.2. A Tree Protection Plan is required as a part of the materials submitted with applications for a tentative map, use permit, variance, design review, encroachment permit, grading permit, or building permit where the proposed work will be located within the dripline of any tree for which a tree removal permit would be required. Project demolition plans include tree protection zones encompassing the drip lines of protected trees.

Response 3.4

The commenter recommends omitting the proposed use of lanterns on mature oak trees to be protected.

Impacts to special-status wildlife is discussed in Section 4.3.3. Based on the existing conditions of the project site within the developed area of the City and former use as an apple orchard, habitat value for special-status wildlife is generally low. Lighting impacts are discussed on page 4.1-7 of the Draft EIR. As described therein, Mitigation Measure AES-4 would require the project to amend the final lighting plan to include the identification of all types, sizes, and intensities of wall mounted building lights and landscape accent lighting, and a photometric map. Implementation of Mitigation Measure AES-4 would reduce impacts to a less than significant level. Lighting concepts shown in the site plans, including the image used of the oak with lanterns, are design concept ideas and the project, including the final lighting plan, will be required to undergo appropriate design review and adhere to City standards related to lighting.

Response 3.5

The commenter recommends updating the proposed landscaping to replace Big-leaf Maple with Oregon Oak, and removing dogwood, Birch, and turf grass within Oak root protecting zones.

This comment has been passed on to decision makers. Please see Response 3.2 regarding the City's Municipal Code tree removal permit requirement.

Response 3.6

The commenter states that the Biological Resources Assessment does not include a list of wildlife species observed on the project site.

The commenter is correct that the BRA does not include a list of wildlife species observed during field surveys. However, the potential for special-status wildlife and wildlife corridors does not depend on species observations; rather, it is evaluated based on a habitat assessment. A brief description of each of these species is included within Table A-1 of the BRA, including the species' status, habitat, and probability of occurring on the project site. No special-status species were observed onsite during general surveys.

Response 3.7

The commenter states that the project site is bounded by a trail that acts as a corridor for wildlife and claims that they have observed wildlife along the path.

Impacts to wildlife movement are discussed in Section 4.3.3. The West County Trail is outside of the project site and would not be affected by the proposed project. This trail may provide opportunities for local wildlife movement, but it does not contain suitable natural areas that would contribute to a migratory corridor for wildlife.

Response 3.8

The commenter states that the report does not mention USFWS-listed birds of conservation concern.

Impacts to special-status wildlife are discussed in Section 4.3.3 of the EIR. USFWS-listed birds of conservation concern are not typically included as special-status species under CEQA since they are already addressed under the Migratory Bird Treaty Act. Impacts to native birds would be less than significant with implementation of a nesting bird survey (Mitigation Measure BIO-1[c]).

Response 3.9

The commenter recommends reducing the project density to retain native oaks and provide more space for native shrubs.

Please see Response 3.4, regarding impacts to special-status wildlife. Note also that with mitigation, impacts to biological resources were found to be less than significant under the proposed project.

Response 3.10

The commenter asks if proposed traffic light timing adjustments would be adequate to reduce traffic impacts to a less than significant level.

Prior to SB 743, CEQA analysis typically treated automobile delay and congestion as an environmental impact. Instead, SB 743 requires the CEQA Guidelines to prescribe an analysis that better accounts for transit and reducing greenhouse gas emissions. In November 2017, the Governor's Office of Planning and Research (OPR) released the final update to CEQA Guidelines consistent with SB 743, which recommend using vehicle miles traveled (VMT) as the most appropriate metric of transportation impact to align local environmental review under CEQA with California's long-term greenhouse gas emissions reduction goals. The Guidelines required all jurisdictions in California to use VMT-based thresholds of significance by July 2020. Because LOS impacts are no longer considered significant impacts under CEQA, therefore, traffic congestion-related mitigation measures are not required. Therefore, traffic congestion was not analyzed in the Draft EIR based on this state law.

Refer to Section 4.13, *Transportation*, of the EIR for more transportation analysis. As noted therein, pursuant to Section 15064.3 of the *CEQA Guidelines*, traffic delay, which is what LOS measures and describes, shall not constitute a significant environmental impact for land use projects. However, General Plan Policy CIR1-7 requires projects with potentially significant impacts to circulation to provide a circulation impact report to provide decisionmakers with a picture of the impacts associated with a project and allow decision-makers to determine appropriate improvements to alleviate traffic impacts. In addition, General Plan Policy CIR 1-8 requires review of multi-modal LOS objectives where applicable.

While that information may not be used to justify a significant impact under CEQA (and thus in the Draft EIR), an LOS study has been provided in detail in the Transportation Impact Study (Appendix G) for reference, which includes a discussion of recommended traffic light timing adjustments. As stated therein, the project would result in a greater than a five percent increase in average delay at SR 116/North Main Street, which would operate unacceptably at LOS E during the p.m. peak hour with or without the project. As a result, this is considered an adverse project impact under the City's standards. The Transportation Impact Study determined that optimizing the signal's cycle length and splits to accommodate project trips would result in an improved LOS D. Therefore, the project applicant's recommended contributions to the City's Traffic Impact Fee (TIF) could be utilized to adjust the signal's timing, resulting in LOS D which would be an improvement compared to existing conditions. With this improvement, the intersection would operate in accordance with City standards.

Response 3.11

The commenter requests information regarding the project's operational water demand and groundwater recharge including how climate change and cumulative development may impact declining groundwater stores in the future.

The commenter is correct that the anticipated water demand during operation is not discussed in the hydrology section; that is because for CEQA analysis, water demand is discussed in Section 4.15, *Utilities and Service Systems*. As described therein, the City relies exclusively on groundwater as a water supply source. As stated on page 4.15-10, according to the City's General Plan, the average total per capita water production between 2006 and 2015 was 129 gallons per person per day. Utilizing the water usage rate of 129 gallons per capita per day, the total annual water demand of the proposed project was calculated to be approximately 9.6 mg[1], or 0.77 percent of the 1,237 mg maximum production for the city. The Draft EIR determined that the projected water supply currently available for production by the City of Sebastopol exceeds the projected water demand associated with the proposed project and the project would not exceed the City's available water production capabilities. Compliance with existing regulations and inclusion of the proposed water-conserving project features would also help ensure that an adequate supply of water is provided to the proposed project during normal, dry, and multi-dry year conditions. Therefore, impacts would be less than significant.

Groundwater recharge is addressed on pages 4.8-12 through 4.8-13 of the Draft EIR. As described therein, runoff from impervious surfaces would be detained in detention basins and recharged adjacent to the site, resulting in the same amount of groundwater recharge post-project as under existing conditions. Therefore, the project would not substantially interfere with groundwater recharge at the project site.

Cumulative impacts regarding water demand and groundwater recharge are discussed on page 4.8-17. As described therein, proposed project would increase the demand for water, which would be derived solely from groundwater sources. Cumulative development would also increase demand for groundwater supplies. It is anticipated that cumulative development would result in a significant cumulative impact. The proposed project includes the upgrade of stormwater detention areas, which would be consistent with Groundwater Sustainability Plan (GSP) goals for groundwater recharge, and as described under Impact HYD-2, the project would allow for a net recharge to groundwater and would not interfere with sustainable management of the groundwater basin.

[1] 2 9.6 mg = 204 residents * 129 mg * 365

Consequently, the proposed project would not result in a considerable contribution to a significant cumulative impact related to groundwater. Cumulative impacts pertaining to utility availability are discussed on page 4.15-12. As described therein, cumulative projects would rely on the City for their water supply and the City's water supply is expected to be available for normal, dry, and multi-dry year conditions. Therefore, cumulative impacts related to water demand were determined to be less than significant.

Regarding the commenter's question about climate change, climate change scenarios were incorporated into the modeling used in the Santa Rosa Plain Groundwater Subbasin GSP referenced in Section 4.8, *Hydrology and Water Quality* of the Draft EIR. As stated in the GSP, the Santa Rosa Plain Groundwater Sustainability Agency (GSA) chose a climate change scenario that provides for several very dry years through 2025; normal and wetter years through 2050; and then a long-term drought after the mid-twenty-first century. This climate scenario allows for a significant stress test for groundwater resources planning during the GSP implementation horizon (Sonoma Water 2021). The analysis in the GSP accounts for growth planned in the City's 2016 General Plan Update, which includes the addition of 750 housing units. Approximately 170 housing units were constructed in the City from 2015 until 2023, and along with the 96 units (80 units with the potential for up to 16 ADUs) contemplated in the proposed project this does not exceed the 750 housing units considered in the 2016 General Plan Update and in the GSP referenced in the Draft EIR for the project. Therefore, water demand from new housing units, like the housing proposed by this project, was already accounted for in the future water demand determined in the GSP, and would not be an unanticipated use of groundwater.

Potential future impacts to water supply from climate change are provided on page 4.6-4 of the Draft EIR for additional context.

Response 3.12

The commenter asks what portion of the project's energy use will be provided by the proposed solar panels and if they meet Sebastopol's requirements.

The exact portion of energy that would be provided by solar panels has not yet been determined. Energy impacts are discussed in Section 4.16, *Impacts Found to Be Less Than Significant*. As described therein, no conflict with an applicable plan, policy or regulation adopted for the purpose of renewable energy or energy efficiency is anticipated and there would be no impact. As described on Page 4.2-5 of the Draft EIR, the proposed project would exceed the energy efficiency measures with the 2022 Title 24 Building Efficiency Standards by 5 to 10 percent. For example, the project would dedicate circuitry for electric vehicle charging stations for all townhome garages, which is beyond the requirement of the 2022 Title 24 Standards. The CALGreen standards are updated every three years and become increasingly more stringent over time. The building official has also confirmed that this project would meet these requirements.

Energy sources for the project are discussed in Section 4.6, *Greenhouse Gas Emissions*, of the EIR. Electricity would be provided to the project site by Pacific Gas and Electric (PG&E), and the project would utilize renewable electricity through the use of solar panels. Homeowners also have the option to opt into the SCP program, which provides residents and businesses in Sonoma and Mendocino counties with renewable resources, such as geothermal, wind, and solar. All garages would be wired for EV charging and solar battery backup, and the project would include energy star appliances and Nest thermostats.

Response 3.13

The commenter questions if there will be deed restrictions regarding short-term rentals and second homes.

The comment regarding deed restrictions does not pertain to the analysis presented in the Draft EIR. Future owners or residents of housing units are not determined through CEQA.

Response 3.14

The commenter claims that describing the site as surrounded by residential and commercial uses insufficiently describes that the site is also adjacent to a trail, open space, and a school. The commenter expresses concerns regarding visual changes to the community and recommends increased setbacks from the trail, and reducing the height and density of the project, and the inclusion of native trees. The commenter also claims the project is not consistent with the existing residential scale of the neighborhood.

This comment has been noted and passed on to decision makers. Impacts related to aesthetics are discussed in Section 4.1, *Aesthetics*, of the Draft EIR. As stated on page 4.1-1 of the EIR, the project site is described as being located in a neighborhood characterized by a mix of uses including residential, educational, commercial, and recreational. It also states that the project site is directly adjacent to the West County Trail, that the Sebastopol Charter School is located north of the site, and that the project site is undeveloped and is characterized by mature trees. Regarding the commenter's concerns about visual changes to the neighborhood, as described in Section 4.1, *Aesthetics*, implementation of Sebastopol Design Guidelines and compliance with Sebastopol Municipal Code (SMC) Chapters 17.450 and 16.40 would ensure that development would be consistent with design guidelines through design review and would ensure that the project would be consistent with existing surrounding development. As described on page 4.1-6, the Draft EIR found that the project, which requires approval of a Conditional Use Permit, would be consistent with existing land use designation and zoning. As discussed on Page 2-4 of the Draft EIR, the project would comply with the height limitations and setback requirements in the SMC through the use of a State Density Bonus to allow a waiver to increase the building height to three stories, which would ensure the sensitive design and siting of future residences in a way that is visually compatible with the development scale and style of the surrounding area. The project's consistency with SMC R7 Development Standards is shown in detail in Table 4.9-2. The commenter is correct that the height of the proposed project is consistent with the height of the adjacent office park buildings, which are now included in the baseline conditions for visual character surrounding the project site.

Regarding the commenter's request to retain native trees, an updated tree impact summary provided by Horticultural Associates on January 23, 2024 states that 91 of the trees on-site would be preserved, including 63 protected trees. Furthermore, as described on Page 4.1-5, the project applicant would be required to comply with the Sebastopol Municipal Code Chapter 8.12, Tree Protection, which would include a review of tree removal plans, landscape plans, and specification of a tree replacement ratio by the Planning staff or the City Arborist during the project design review. Pending approval, removed protected trees must be replaced with an approved tree species on the approved tree List, as described in Mitigation Measure BIO-2.

Response 3.15

The commenter requests an update to site plans to include eye-level walls proposed to reduce noise, fences, and solar panels. The commenter asks how much noise will increase in neighborhoods adjacent to the project site, and if proposed fences along Hurlbut Avenue are within the allowable height.

The request regarding updated plans has been passed on to decision makers for consideration. Impacts related to noise are addressed in Section 4.10, *Noise*, of the Draft EIR. As discussed therein, impacts related to temporary or permanent increase in ambient noise levels in the vicinity of the project would be less than significant with implementation of Mitigation Measure NOI-1, which requires a solid barrier with a height blocking the line-of-sight to the nearby noise sensitive receptors to reduce noise due to mechanical equipment. Once the final equipment selection is made, Mitigation Measure NOI-1 also requires the completion of an acoustical analysis of the noise from project mechanical and electrical equipment to surrounding properties prior to final design to verify compliance with the City's nighttime exterior noise standard of 45 dBA.

Response 3.16

The commenter requests additional information regarding fencing. The commenter requests illustrations that include the proposed fencing, as well as the solar panels and other project infrastructure not currently shown. The commenter asks if a 42-inch fence is allowable by the City.

The request regarding updated plans has been passed on to decision makers for consideration. Fences up to 6 feet are allowable at the rear of the property, and front yard fencing is allowed up to 42 inches. Fencing already exists in residential neighborhoods adjacent to the project site and the proposed fencing would not impact views from the project site; therefore, it would not result in a significant visual impact. A conceptual wall and fence plan is included on page 36 of the Project Plans and Drawings available on the City's website via this link: https://www.cityofsebastopol.gov/wp-content/uploads/2023/08/The-Canopy-DR-Submittal-Drawings-compressed.pdf

Response 3.17

The commenter asks if there will be restrictions to prevent conflicts with dark sky guidelines and recommends omitting art features to incorporate more native landscaping.

This comment has been noted and passed on to decision makers. Impacts regarding nighttime lighting are discussed on Page 4.1-7 of the Draft EIR. As described therein, the proposed project would introduce nighttime light sources associated with lighting of the proposed buildings and the project could affect nighttime views in the area. General Plan Policy COS 11-8 requires all outdoor lighting to be constructed with full shielding and/or recessed to reduce light trespass to adjoining properties and to reduce illumination of the night sky and be directed downward and away from adjoining properties and public rights-of way, so that no light fixture directly illuminates an area outside of the site. Policy COS 11-7 restricts outdoor lighting and glare from development projects to retain the quality of night skies by minimizing light pollution. However, there are no municipal code requirements that implement the General Plan policies related to outdoor lighting, or the design guidelines regarding site lighting. Therefore, Mitigation Measure AES-4 requires exterior lighting installed on the project site to be of low intensity, low glare design, and hooded to direct light downward onto the subject parcel and prevent spill-over onto adjacent parcels and to otherwise meet dark night sky requirements. Impacts were determined to be less than significant with implementation of Mitigation Measure AES-4.

Response 3.18

The commenter encourages redevelopment of existing developed but underutilized sites including an empty strip mall across the 116 from the project site or the O'Reilly building.

This comment will be noted and passed on to decision-makers. However, expressions of opinion relating to the proposed project are not related to the adequacy of the analysis and conclusions in the EIR.

John Jay

From: Paul Fritz <paul@fritzarchitecture.com>
Sent: Tuesday, January 9, 2024 11:32 AM
To: Kari Svanstrom; John Jay
Subject: RE: tonight's Planning Commission meeting - cancellation

Hi Kari and John,
I'm sending my questions/comments about the Canopy draft EIR. A lot of these are just clarifications. The numbers are the page numbers of the pdf document.

- 10 – I'm not understanding the FAR calculation. Note 1 says the FAR is calculated by dividing the allowed lot coverage by the total ground floor area. This is not the way FAR is typically calculated. 4.1
- 12 – contaminated soil is to be buried with 6" of new soil. On page 160 the 6" is also mentioned, but on page 174 it says contaminated soil will be buried with 6' of new soil. 4.2
- 13 – due alternatives 2 and 3 assume minimum and maximum allowed density? Just wondering how these unit numbers were arrived at. 4.3
- 24 – HYD-1 – it says impacts would be less than significant with mitigation, but no mitigation measures are proposed. 4.4
- 27 – TRA-1 states the proposed path is at the center of the site, but the plan and other parts of the document note the path connection to 116 is at the south end of the site as the O'Reilly owner did not want to grant the easement through the center of the property. This is also mentioned on page 265. 4.5
- 40 – Many of the site descriptions mention Hwy 116 as being north of the property. This is one example. This one also states the West County Trail is to the east, but really it is north, as is the Charter School, which is not often mentioned as an adjacent use.
- 61 – In the third paragraph of the discussion of climate and topography, I'm wondering if the second sentence is describing the summer conditions rather than winter. The third sentence also mentions winter months. 4.6
- 223 – Policy N-1.13 – Error! Reference source not found. This should be fixed or removed. 4.7
- 229 – Table 4.10-6 has a Construction Activity Phase of 'Architectural Coating'. I'm not familiar with this construction phase. What is this supposed to be? 4.8
- 532 – existing site conditions mentions a sports facility to the north. I think this is probably the Charter School. 4.9
- 624 – residential density is noted as 15.7 du/ac. Table ES-1 on page 10 states the density as 13.1 du/ac. If the 13.1 du/ac is correct, does this impact the VMT reduction calculation? 4.10
- 636 – The sight distance at the Mill Station Rd entrance is noted as being inadequate. Is mitigation not required as this is an existing condition? 4.11

Thanks!
Paul

fritz ARCHITECTURE URBANISM

P.O. Box 1074
Sebastopol, CA 95473

707.975.6220

John Jay

From: Kari Svanstrom
Sent: Tuesday, January 9, 2024 4:28 PM
To: John Jay
Subject: FW: tonight's Planning Commission meeting - cancellation

From: Seth Hanley <Seth@studioblitz.com>
Sent: Tuesday, January 09, 2024 1:08 PM
To: Kari Svanstrom <ksvanstrom@cityofsebastopol.gov>; Nzuzi Mahungu <nmahungu@cityofsebastopol.gov>
Subject: Re: tonight's Planning Commission meeting - cancellation

Hi Kari, Nzuzi.

I appreciate the hard work that went into preparing this comprehensive report, my thanks to the Planning Dept. I will be present on Jan. 23rd.

Admittedly, I haven't reviewed every page in detail, and I'm also playing catch up since I wasn't party to any earlier applications or discussions. Hence, some of these questions, comments, observations may be redundant, but will facilitate my own learning here with respect to the project and the process.

1. I don't see a recommendation (neg dec, or mit neg dec, etc.). Does this only come after public comments on the draft report?
2. I'm curious as to why the development doesn't connect to Hurlbut Ave. It seems like an easy connection to make, and would facilitate funnelling traffic from the Canopy site to two intersections along Grav N. with existing stop lights (rather than adding the new driveway from the existing O'Reilly parking lot.
3. Has the FD weighed-in on access and driveway design as part of the EIR? I see the engineer has, but unclear on the FD (just curious).

Some other thoughts(and to be clear - I'm not sure if this in our remit as commissioners or not, so feel free to tell me these are out of our scope):
-Page ES-4: It is noted that 4 alternatives were studied, but only 3 are noted (is this a typo or is one missing?).
-Page ES-4: Alternative 2 is noted as 'environmentally superior', but it seems like it's worth noting that the developer is able to build what they're proposing (and could in fact build more - per Alt. 3 if I'm reading this correctly).
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-Page 6-2 (Integral Report): Page ES-3 of the EIR notes that 22 trees need to be removed to accommodate the new project, whereas the Integral report notes 41. Has the project been modified since the Integral report to reduce the number of removed trees (maybe it relates to tree radius)?

Best,
Seth.

Letter 4

COMMENTER: Paul Fritz

DATE: January 9, 2024

Response 4.1

The commenter requests clarification about how the Floor Area Ratio (FAR) is calculated.

Table ES-1 has been updated to replace the reference to FAR with the lot coverage, as FAR is not used in the R7 zone.

Table ES-1 Proposed Residential Development Summary

Feature	Details
Townhome Project Characteristics	
Residential area	69,317 square feet
Lot Coverage	Allowed: 40% or 106,333 sf Proposed: 26% or 69,317 sf +/-
~~Floor Area Ratio (FAR)~~	~~1.53[1]~~
Density	Allowed: 12.1 to 25 dwelling units/acre Proposed: 13.1 dwelling units/acre
Building Height	Allowed: 30 feet and 2 stories Proposed: 40 feet +/- and 3 stories with Density Bonus Waiver

Response 4.2

The commenter requests clarification about whether contaminated soil would be buried with 6" or 6' of new soil.

The on-site burial cells for excavated contaminated soil would be capped with six feet of new soil, and impacted soil to remain within the driplines of trees to be retained would be capped with six inches of new soil. Refer to Section 4.7, *Hazards and Hazardous Materials*, for more information.

Response 4.3

The commenter requests clarification about how alternatives 2 and 3 determined unit numbers, and if they assume minimum and maximum allowed density.

The numbers for Alternative 3 were derived from a previously proposed version of the same project. Alternative 2 was calculated using the minimum density allowed of 12.1 DU/acre. 12.1*6.1 acres = 73.81 but was rounded down to 73 units since it is not possible to build a portion of a unit.

Response 4.4

The commenter notes that HYD-1 states impacts would be less than significant with mitigation, but no mitigation measures are listed.

The commenter is correct that there is a typo on Page ES-16. As discussed in Section 4.8, *Hydrology and Water Quality*, implementation of Mitigation Measures HAZ-3a and HAZ-3b would reduce impacts to less than significant.

Page ES-16 has been revised with the following (changes shown in strikeout/underline):

Hydrology and Water Quality		
Impact HYD-1. Development facilitated by the project would not violate water quality standards or Waste Discharge Requirements, or otherwise substantially degrade surface or groundwater quality. Impacts would be less than significant with mitigation.	~~None required.~~ Mitigation Measure HAZ-3(a) and HAZ-3(b).	Less than Significant with Mitigation

Response 4.5

The commenter requests clarification about the location of Highway 116, West County Trail, and the Charter School in relation to the project site.

Regarding the commenter's question pertaining to Mitigation Measure TRA-1, the following changes have been made to Mitigation Measure TRA-1 for clarification:

TRA-1 Pedestrian Connectivity and Safety. A new pedestrian path shall be added ~~through the center of the project site in order~~ to link the project and mixed commercial office park to the new HAWK crossing across the north leg of the intersection of SR 116/Danmar Drive ~~after Caltrans constructs the HAWK crossing and~~ before an occupancy permit is issued.

Changes to Mitigation Measure TRA-1 do not rise to the level of "new information" as defined in Section 15088.5 of the *CEQA Guidelines*, and thus recirculation of the Draft EIR is not required.

Regarding the commenter's suggested correction, Page 2-4 has been revised with the following correction (changes shown in strikeout/underline):

The project site is currently undeveloped but includes existing vegetation and mature trees. An informal pedestrian pathway bisects the site to connect the existing O'Reilly Media Center parking lot to the West County Trail, allowing use of the trail. To the ~~east~~north, the site is directly adjacent to the West County Trail, a paved trail that links Sebastopol with areas to the Northwest, including Graton and Forestville. In addition, the trail connects in downtown Sebastopol to the Joe Rodota Trail, which connect downtown Santa Rosa and Sebastopol. These trails run parallel to Highway 116 to the North of the site and along Highway 12 from eastern Sebastopol to Santa Rosa and is a popular route for cyclists and pedestrians (Sonoma County 2023). ~~(Sonoma County 2023).~~

Response 4.6

The commenter asks if climate conditions described refer to winter or summer conditions.

The sentence on Page 4.2-1 described by the commenter describes summer climate conditions. Page 4.2-1 has been updated with the following correction (changes shown in strikeout/underline):

The major large-scale weather feature controlling climate in Sebastopol is a large high-pressure system located in the eastern Pacific Ocean, known as the Pacific High. During ~~winter~~summer months, marine air trapped in the lower atmosphere is often condensed into fog by the cool Pacific Ocean. Stratus-type clouds usually form offshore and move into the area during the evening hours. During winter months, the Pacific High becomes weaker and shifts south, allowing weather systems associated with the polar jet stream to affect the region. Low pressure systems produce periods of cloudiness, strong shifting winds, and precipitation. High-pressure systems are also common in winter, with low-level inversions that produce cool stagnant conditions.

Response 4.7

The commenter requests a reference be corrected.

The reference link on page 4.10-9 refers to the stationary (non-transportation) noise source standards in Table 4.10-3 in the Draft EIR. In Sebastopol's General Plan, Policy N-1.13 refers to Table N-2 in the General Plan, which shows the same stationary (non-transportation) noise source standards that are included in Table 4.10-3 in the Draft EIR.

Page 4.10-9 has been updated with the following correction (changes shown in strikeout/underline):

Policy N-1.13 Control non-transportation related noise from site specific noise sources to the standards shown in ~~Error! Reference source not found~~Table 4.10-3.

Response 4.8

The commenter requests an explanation of the architectural coating phase in Table 4.10-6.

The architectural coating phase of construction describes the process of applying architectural coatings to the buildings. Architectural coatings are protective products applied to buildings including house paints, stains, industrial maintenance coatings, traffic coatings, and many other products.

Response 4.9

The commenter suggests a reference to a sports facility may intend to refer to the Charter School.

The commenter is correct that the Charter School is located north of the project site. This reference is made in an Appendix to the EIR, and the information is provided for context but does not relate to impact analysis or conclusions, and thus does not pertain to the nature or adequacy of the analysis in the Draft EIR. However, Page 1 of the Biological Resource Analysis has been revised, and is contained in revised Appendix C, attached to this Final EIR.

Response 4.10

The commenter requests clarification about the project's residential density.

The project's residential density is 13.1 dwelling units/acre, not counting ADUs, and 15.7 dwelling units per acre including ADUs. A prior version of the Transportation Impact Study was provided as Appendix G to the Draft EIR, which listed the higher project density, while page 4.13-12 of the Draft EIR used the lower project density in order to ensure a conservative analysis. An updated version of the Transportation Impact Study has been provided (revisions to the VMT density can be found on pages 10-11) and is available as an appendix to the Final EIR. The project density described within the Draft EIR correctly corresponds to the updated version of the Transportation Impact Study. The lower project density was used for a more conservative analysis, as lower density projects receive a lower VMT reduction. See Table 4 in the Transportation Impact Study regarding the applicable VMT reduction and adjusted VMT. Neither project density results in a significant VMT impact. Therefore, the information contained within the Draft EIR, in conjunction with the updated Transportation Impact Study that will be provided in the Final EIR, would not constitute the addition of substantial new information and would not require recirculation of the Draft EIR.

Response 4.11

The commenter states that the sight distance at the Mill Station Road entrance is inadequate and asks if mitigation is required for this existing condition.

Sight distances are discussed on Page 4.13-13 of the Draft EIR. The commenter is correct that, as discussed therein, this is an existing condition of the roadway and would not change as a result of the proposed project. Therefore, it is not an impact caused by the project and mitigation is not required.

According to email correspondence with W-Trans on February 1, 2024, the sight distance at the private driveway location on Mill Station Road was field measured at approximately 100 feet in each direction. Towards the east, sight distance extends to the raised crossing of the West County Trail where the extension of Mill Station Road crosses the trail before accessing the Sebastopol Charter School. As traffic slows to 5-10 mph as it reaches the raised trail crossing, the existing sight distance would be considered adequate. Sight distance to the west and the intersection with SR116 is limited by trees and vegetation on the south side of the extension of Mill Station Road. This sight distance does not meet the stopping sight distance requirement of 200 feet in each direction for five mph over the prima facie speed limit of 25 mph. As landscaping and signage can impede sight lines, any landscaping or signage placed within the vision triangle at the driveway should be less than three feet or more than seven feet above the pavement surface to maintain a clear line of sight. As this is an existing condition, it would not be considered a significant impact of the project and could be addressed through clearing of brush and vegetation which blocks sight distance towards the SR116 intersection.

John Jay

From: Kari Svanstrom
Sent: Tuesday, January 9, 2024 4:28 PM
To: John Jay
Subject: FW: tonight's Planning Commission meeting - cancellation

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From: Seth Hanley <Seth@studioblitz.com>
Sent: Tuesday, January 09, 2024 1:08 PM
To: Kari Svanstrom <ksvanstrom@cityofsebastopol.gov>; Nzuzi Mahungu <nmahungu@cityofsebastopol.gov>
Subject: Re: tonight's Planning Commission meeting - cancellation

Hi Kari, Nzuzi.

I appreciate the hard work that went into preparing this comprehensive report, my thanks to the Planning Dept. I will be present on Jan. 23rd.

Admittedly, I haven't reviewed every page in detail, and I'm also playing catch up since I wasn't party to any earlier applications or discussions. Hence, some of these questions, comments, observations may be redundant, but will facilitate my own learning here with respect to the project and the process.

1. I don't see a recommendation (neg dec, or mit neg dec, etc.). Does this only come after public comments on the draft report? 5.1
2. I'm curious as to why the development doesn't connect to Hurlbut Ave. It seems like an easy connection to make, and would facilitate funnelling traffic from the Canopy site to two intersections along Grav N. with existing stop lights (rather than adding the new driveway from the existing O'Reilly parking lot. 5.2
3. Has the FD weighed-in on access and driveway design as part of the EIR? I see the engineer has, but unclear on the FD (just curious). 5.3

Some other thoughts(and to be clear - I'm not sure if this in our remit as commissioners or not, so feel free to tell me these are out of our scope):
-Page ES-4: It is noted that 4 alternatives were studied, but only 3 are noted (is this a typo or is one missing?). 5.4
-Page ES-4: Alternative 2 is noted as 'environmentally superior', but it seems like it's worth noting that the developer is able to build what they're proposing (and could in fact build more - per Alt. 3 if I'm reading this correctly). 5.5
-Page 19-3: Under BIO-1, should the heading include wording "has the potential to impact", or, "if identified on site"? The current heading reads like there's a significant problem, and the body text suggests that a problem is not anticipated (just for clarity). 5.6
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-Page 6-2 (Integral Report): Page ES-3 of the EIR notes that 22 trees need to be removed to accommodate the new project, whereas the Integral report notes 41. Has the project been modified since the Integral report to reduce the number of removed trees (maybe it relates to tree radius)? 5.9

Best,
Seth.

On Tue, Jan 9, 2024 at 8:02 AM Kari Svanstrom <ksvanstrom@cityofsebastopol.gov> wrote:

Hi all,

Unfortunately the zoom phone number for the mtg tonight was missing from the Meeting Agenda, so we will need to postpone tonight's meeting until Jan 23. (given the Agenda does a not have the public access info, we will not be able to open the meeting. Staff WILL be at the youth annex and open the zoom mtg to let folks know of the change in time/date for the mtg).

We will be able to maintain the same schedule for the project with the hearing on the Jan 23, but please let me know of any planned absences for that night (we also have another hearing on that date that will need a quorum).

If you do have any questions on the Draft EIR document, we would appreciate a head's up so we can get any info prepared/answer any questions you might have on the 23rd. (Of note, this is still the 'draft' process for public and planning commissioner comments, the formal public hearing for the project decision will be March 12.)

Thanks and please let myself or John know if you have any questions.

Kari Svanstrom, AICP, Architect

Planning Director

City of Sebastopol |Planning Department

7120 Bodega Avenue |Sebastopol, CA 95472

(707) 823-6167 phone

www.cityofsebastopol.gov

> *City offices are currently closed to the public, but staff is available via email. City Offices are closed every Friday/and holidays*

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Please note that Blitz will be closed on Monday January 15th, 2024 in observance of Martin Luther King Jr Day

seth hanley ***he/his***

PARTNER + ARCHITECT
AIA / LEED AP

____

FYI, we are closed on Fridays.

san francisco / los angeles
415.525.9181 (cell)
415.525.9179 (main)

find me at: 435 jackson street, san francisco, ca 94111
studioblitz.com / instagram / linkedin

Letter 5

COMMENTER: Seth Hanley

DATE: January 9, 2024

Response 5.1

The commenter asks if a CEQA recommendation will be available after the public comment period.

The commenter mentions recommendations (negative declaration or mitigated negative declaration) that relate to Initial Study documents; however, the document being prepared for the proposed project is not an Initial Study, but rather an EIR. The environmental review process for an EIR is described in Section 1.5, *Environmental Review Process*, of the Draft EIR. Pursuant to *CEQA Guidelines* Section 15090, prior to making a decision on a proposed project, the City must certify that: a) the Final EIR has been completed in compliance with CEQA; b) the Final EIR was presented to the decision-making body of the lead agency; and c) the decision making body reviewed and considered the information in the Final EIR. After the final EIR is complete, the agency determines whether to approve the project or an alternative to the project. Pursuant with *CEQA Guidelines Section* 15094, the lead agency (the City of Sebastopol) will file a Notice of Determination (NOD) with the City Clerk after deciding to approve a project for which an EIR is prepared which will be posted for 30 days and sent to anyone previously requesting notice.

Response 5.2

The commenter asks why the development does not connect to Hurlbut Avenue.

In response to prior public input, there are currently deed restrictions on the parcel preventing a vehicular connection to Hurlbut Avenue. Additionally, Hurlbut Avenue is a small county-owned and county-maintained road with no pedestrian or bicycle facilities.

Response 5.3

The commenter asks if the Fire Department has reviewed the access and driveway design.

The Fire Department has reviewed the access and driveway design. A meeting was held with the fire chief, planning team, and project applicant to discuss road widths on August 17, 2022.

Response 5.4

The commenter states that ES-4 mentions that alternatives were studied, but that only 3 are discussed.

The commenter is correct and has identified a typo. Three alternatives were studied and discussed in Section 6, *Alternatives*.

Page ES-4 has been updated with the following correction (changes shown in strikeout/underline):

As required by the California Environmental Quality Act (CEQA), this EIR examines alternatives to the proposed project. Studied alternatives include the following ~~four~~<u>three</u> alternatives. Based on the alternatives analysis, Alternative 2 was determined to be the environmentally superior alternative.

- Alternative 1: No Project
- Alternative 2: Reduced Development Density
- Alternative 3: Increased Development Density

Response 5.5

The commenter suggests clarifying that while Alternative 2 is determined to be the environmentally superior alternative, the proposed project could feasibly be built.

This comment has been noted. As required by Section 15126.6 of the CEQA Guidelines, the Draft EIR examines a range of reasonable alternatives to the proposed project. While the EIR determined that Alternative 2 would be the environmentally superior alternative, as discussed on Page 6-3, Alternative 2 would not meet goals related to increasing housing inventory as effectively as the proposed project and may not be financially feasible due to development costs. Furthermore, as discussed on Page 6-9 of the Draft EIR, transportation impacts related to vehicle miles traveled for Alternative 2 would be slightly increased compared to the proposed project since it would result in a less dense development buildout.

Response 5.6

The commenter asks if text can be added to the header in impact BIO-1 for clarification.

Page 4.3-13 has been revised with the following changes for clarification (changes shown in strikeout/underline):

Impact BIO-1 THE PROJECT WOULD HAVE <u>THE POTENTIAL TO RESULT IN</u> A SUBSTANTIAL ADVERSE EFFECT ON SPECIAL STATUS ANIMAL SPECIES. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION.

Response 5.7

The commenter asks how the number of units was determined for Alternative 2.

Alternative 2 was calculated using the minimum density allowed of 12.1 DU/acre. 12.1*6.1 acres = 73.81 but was rounded down to 73 units since it is not possible to build a portion of a unit.

Response 5.8

The commenter asks how the number of units was determined for Alternative 3.

The numbers for Alternative 3 were derived from a previously proposed version of the same project.

Response 5.9

The commenter asks how many trees will be removed as a result of the project.

An updated Tree Impact Summary letter by Horticultural Associates was provided on January 23, 2024 and is included as an appendix to the Final EIR. The Tree Impact Summary states that one Coast Redwood at the project entrance was added as an addendum after completion of the original report, therefore, a total of 43 inventoried trees will be removed, including 29 protected trees. The Coast Redwood would be removed as part of the creation of the new driveway apron on the southern part of the site which has access from Hwy 116. The removal of the Coast Redwood would not substantially increase project impacts related to trees. Mitigation Measure BIO-2 would continue to apply. With implementation of Mitigation Measure BIO-2, impacts would be reduced to less than significant. Therefore, the information contained within the Draft EIR, in conjunction with the updated Tree Impact Summary that is provided in the Final EIR, would not constitute the addition of substantial new information and would not require recirculation of the Draft EIR. The Integral report the commenter refers to was provided as an Appendix to the Draft EIR for context but does not need to be updated since the most up-to-date Tree Impact Summary will be provided in the Final EIR.

Page ES-3 of the Draft EIR has revised with the following (changes shown in strikeout/underline):

There are currently ~~133~~134 trees within the project site (including 92 protected trees), and the proposed project would involve the removal of ~~22~~43 trees (including 29 protected trees) while preserving the remaining ~~111~~91 trees (including 63 protected trees) primarily along the perimeter of the site. An existing large, mature coast live oak tree would be retained at the primary entrance to the project entry. Existing oak trees and redwoods would be preserved throughout the site. Additional trees, such as native maples, madrone and dogwood, are proposed to create onsite ecosystems that attract birds and butterflies. Proposed landscaping would include new plantings throughout the open spaces, including the paseo, at the setbacks along drive aisles, roadways, and streets, and surrounding the proposed buildings. Other amenities, including gardens, active and passive seating areas, children's play areas, and a meditation hammock garden are also proposed.

permit SONOMA

County of Sonoma
Permit & Resource Management Department

January 18, 2024 via email to jjay@cityofsebastopol.org

Planning Department
Attn: John Jay, Associate Planner
City of Sebastopol
7120 Bodega Avenue
Sebastopol, CA 95472

RE: "The Canopy" Condominium Project, County File PPR23-0020
1009-1011 Gravenstein Hwy N, APN 060-261-028, 060-261-026

Mr. Jay,

Thank you for the opportunity to comment on the proposed project at the above-referenced property. Staff have reviewed the Notice of Availability, Draft EIR, and associated project materials and determined the project to be consistent with the Sonoma County General Plan. Please see attached General Plan Consistency Determination.

Sonoma County faces a severe housing shortage at all affordability levels, exacerbated by the devastating fires of 2017, 2019, and 2020. Permit Sonoma supports city-centered housing projects like this 96-unit condominium project that help meet local housing needs. 6.1

Thank you for your time and attention to this matter.

If you have any questions, please feel free to contact Doug Bush at 707-565-5276 or email at Doug.Bush@sonoma-county.org.

Sincerely,

Tennis Wick, AICP
Director

Enclosure: General Plan Consistency Determination

cc: File No. PPR23-0020

County of Sonoma
Permit & Resource Management Department

GENERAL PLAN CONSISTENCY DETERMINATION

To:	John Jay, Associate Planner
From:	Doug Bush, Planner III
Date:	January 18, 2024
Project Applicant:	City Ventures
Project Name and File Number(s):	The Canopy Project (County File PPR22-0020)
Project Location/APN #:	060-261-028, 060-261-026 The 6.1 acre project site is bounded by the West County Trail to the north, Highway 116 to the west, unincorporated low density residential development to the north, and a mixed use development to the south. The property is within the Sebastopol City Limits, Urban Growth Boundary and Urban Service Area.
Project Description:	Conversion of a rural site containing remnant apple orchard and native trees, to an 80 unit, three story condominium development with 16 accessory dwelling units, including 160 garaged parking spaces, 58 surface parking spaces and 96 bicycle parking spaces.
General Plan Land Use:	Sebastopol General Plan
Zoning:	Sebastopol Zoning
General Plan Consistency Determination:	No Conflict

6.2

Applicable General Plan Policies:

Goal LU-2: Accommodate the major share of future growth within the nine incorporated cities and their expansion areas and within selected unincorporated communities, which are planned to have adequate water and sewer capacities.

Objective LU-2.5: Provide sufficient opportunities for higher density housing within the Urban Service Areas to accommodate the population growth quantified in the Housing Element Objectives for lower and moderate income units.

Goal LU-3: Locate future growth within the cities and unincorporated Urban Services Areas in a compact manner using vacant "infill" parcels and lands next to existing development at the edge of these areas.

Policy LU-3c: Avoid urban sprawl by limiting extension of sewer or water services outside of designated Urban Service Areas pursuant to the policies of the Public Facilities and Services Element.

Policy HE-3e: Continue to encourage affordable infill projects on underutilized sites within Urban Service Areas by allowing flexibility in development standards pursuant to state density bonus law (Government Code § 65915).

Policy PF-1f: Avoid extension of public sewer services outside of either a sphere of influence or Urban Service Area. To the extent allowed by law, consider exceptions to this policy only where necessary to resolve a public health hazard resulting from existing development.

Policy PF-1h: Avoid extension of public water service to a property that is outside of both the Urban Service Area and sphere of influence of the water provider. To the extent allowed by law, consider exceptions to this policy only where necessary to resolve a public health hazard resulting from existing development. 6.2

Goal OSRC-4: Preserve and maintain views of the night time skies and visual character of urban, rural, and natural areas, while allowing for nighttime lighting levels appropriate to the use and location.

Objective OSRC-4.1: Maintain night time lighting levels at the minimum necessary to provide for security and safety of the use and users to preserve night time skies and the night time character of urban, rural and natural areas.

Discussion

The proposed project is located within the City of Sebastopol and is not subject to the Sonoma County General Plan, or County Code. It is the policy of the County of Sonoma, to focus urban development within incorporated areas like the City of Sebastopol in a compact manner (Goal LU-3). The proposed project would create a total of 96 dwelling units, including 80 condominiums and 16 potential accessory dwelling units. Of the 80 units, 12 would be deed-restricted as affordable to moderate-income households. The region is experiencing a housing crisis, including severe housing shortages exacerbated by the loss of thousands of dwellings through repeated local wildfire events. City centered housing development, particularly projects that contribute a range of housing types to meet a range of affordability needs, and those which are located near amenities and support alternative transportation like this one, are an important part of addressing present housing needs without contributing to sprawl. 6.3

The project is adjacent to the West County Trail and project materials reference integration with this amenity. Staff recommends that the project be referred to Sonoma County Regional Parks for their consideration and comment. 6.4

The project plans available at the time of this review contained only conceptual lighting plans. The County encourages lighting to be designed consistent with Goal OSRC-4 and Objective OSRC-4.1 as listed above, to minimize impacts to the night sky and avoid glare on adjacent properties. 6.5

Letter 6 (Cover Letter)

COMMENTER: Tennis Wick, AICP (Permit Sonoma)

DATE: January 18, 2023

Response 6.1

The commenter provides a cover letter stating that the project has been determined to be consistent with the Sonoma County General Plan and states that Permit Sonoma supports city-centered housing projects.

This comment has been noted and passed on to decision makers.

Response 6.2

The commenter provides the General Plan Consistency Determination of "no conflict" and lists applicable General Plan policies.

This comment has been noted and passed on to decision makers.

Response 6.3

The commenter summarizes details about the proposed project and states that it is not subject to the Sonoma County General Plan or County Code. The commenter states that projects like the proposed project help address housing needs without contributing to sprawl.

This comment has been noted and passed on to decision makers.

Response 6.4

The commenter recommends referring the project to Sonoma County Regional Parks for their consideration and comment.

Sonoma County Regional Parks was contacted on January 23, 2024 in response to comments from the County of Sonoma and will be referred to the project as part of the entitlement process going forward.

Response 6.5

The commenter encourages lighting to be designed consistent with Goal OSRC-4 and Objective OSRC-4.1 to minimize impacts to the night sky and avoid glare on adjacent properties.

This comment has been noted and passed on to decision makers. Regarding the recommendation for lighting to be designed consistent with Goal ORSC-4 and Objective ORSC-4.1, please refer to Response 3.17 for more information about how the project's impacts to nighttime lighting levels will be reduced to a less than significant level with the implementation of Mitigation Measure AES-4.

Department of Toxic Substances Control

Yana Garcia
Secretary for
Environmental Protection

Meredith Williams, Ph.D., Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Gavin Newsom
Governor

SENT VIA ELECTRONIC MAIL

January 19, 2024

John Jay
Associate Planner
City of Sebastopol
7120 Bodega Avenue
Sebastopol, CA 95472
jjay@cityofsebastopol.org

RE: DRAFT ENVIRONMENTAL IMPACT REPORT (DEIR) FOR THE CANOPY RESIDENTIAL PROJECT – 1009 – 1011 GRAVENSTEIN HIGHWAY NORTH, DATED DECEMBER 07, 2023 (STATE CLEARINGHOUSE NUMBER: 2023070072)

Dear John Jay,

The Department of Toxic Substances Control (DTSC) has reviewed the Draft Environmental Impact Report (DEIR) for The Canopy Residential Project - 1009-1011 Gravenstein Highway North, which evaluates the proposed development of 80 townhome-style condominiums and up to 16 accessible accessory dwelling units on a vacant lot located at 1009-1011 Gravenstein Highway North in the City of Sebastopol, California. 7.1

As mentioned in the DEIR, DTSC and City Ventures Homebuilding, LLC, entered into a Standard Voluntary Agreement (SVA) on April 26, 2023 (Docket No. HSA-FY22/23-022), to oversee the investigation and cleanup of approximately 6.1 acres on Sonoma County Assessor's Parcel Numbers 060-261-026 and 060-261-028 (Site). As part of the SVA, a Removal Action Workplan (RAW) has been prepared to address arsenic and

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lead-impacted soils at the Site. Implementation of the RAW would include the excavation of the impacted soil outside of the protected tree line, on-Site burial and capping of impacted soil, and adoption of a deed restriction. Information about the Site and the proposed cleanup activities can be viewed by visiting DTSC's EnviroStor website for 1009 - 1011 Gravenstein Highway.

The RAW is subject to review and approval by DTSC and is considered a decision document that must comply with the California Environmental Quality Act (CEQA). As a Responsible Agency under CEQA and the lead agency for site remediation, DTSC anticipates utilizing the Environmental Impact Report (EIR) to comply with CEQA since remedial activities presented in the RAW would be fundamentally incorporated as part of the site preparation and construction activities for the residential development project. DTSC generally concurs with the analysis provided in the DEIR but wishes to provide the following comments in order to clarify some details regarding the Site's disposition and DTSC's cleanup oversight process for this project: 7.1 cont.

1) Section 4.7.3 and Table ES-2 of the DEIR state the Site is included on a list of hazardous materials sites compiled pursuant to Section 65962.5 (also known as the "Cortese List"). As of the date of this letter, the Site is not included among any of the lists identified subsection 65962.5(a) which make up DTSC's portion of the Cortese List. A list of DTSC sites included on the Cortese List is available to view on DTSC's EnviroStor Hazardous Waste and Substances Site List (Cortese) page.

   For clarification, the Site appears on DTSC's EnviroStor website so information regarding the cleanup process for the subject Site is available for public review. EnviroStor is utilized to provide information about numerous sites, not all of which are Cortese List sites. While it is correct that DTSC and the project proponent have entered into a Standard Voluntary Agreement, this is not a condition described in Health and Safety Code section 65962.5(a). DTSC recommends correcting text in the DEIR to clarify that the Site is not on the Cortese List. For more information on the Cortese List, please visit CalEPA's Cortese List Data Resources webpage. 7.2

2) Sections 1.4 and 2.7 of the DEIR state that DTSC is responsible for approving the Soil Management Plan (SMP) associated with cleanup activities at the Site. While it is correct that DTSC will review and approve the SMP as part of the cleanup oversight process, DTSC wishes to clarify that the Removal Action Workplan (RAW) is the primary decision document for which DTSC is 7.3
responsible for reviewing and approving for the Site. DTSC recommends revising text in the DEIR as needed and/or making note of this distinction in a Response to Comments to clarify this point.

3) Section 4.7.1.e summarizes information from the RAW, including the RAW's recommended removal action alternative. In addition to the information presented there, DTSC would like to note that the RAW is still under review. As part of this process, the RAW will be made available for public review and comment. Notice 7.4
of this public review period will be provided via a Community Update mailed to surrounding property owners and residents as well as a Public Notice published in a local newspaper. The notice will announce the proposed remedy, how to review the draft RAW, and the start of the public comment period.

DTSC appreciates the opportunity to review and comment on the DEIR for The Canopy Residential Project - 1009-1011 Gravenstein Highway North and the City of Sebastopol's consideration of these comments. If you have any questions or concerns, please contact me or a member of our CEQA Unit Team.

Sincerely,

Dave Kereazis

Dave Kereazis
Associate Environmental Planner
CEQA Unit-Permitting/HWMP
Department of Toxic Substances Control
Dave.Kereazis@dtsc.ca.gov

cc: (via email)

Governor's Office of Planning and Research
CEQA State Clearinghouse
State.Clearinghouse@opr.ca.gov

Gavin McCreary
Project Manager
Site Mitigation and Restoration Program
Department of Toxic Substances Control
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Tamara Purvis
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Tamara.Purvis@dtsc.ca.gov

Letter 7

COMMENTER: Dave Kereazis, Associate Environmental Planner (Department of Toxic Substances Control)

DATE: January 19, 2024

Response 7.1

The commenter confirms that the Department of Toxic Substances Control (DTSC) has reviewed the Draft EIR and that DTSC and City Ventures Homebuilding, LLC, entered into a Standard Voluntary Agreement (SVA) to oversee the investigation and cleanup of the project site. The commenter states that a Removal Action Workplan (RAW) has been prepared to address arsenic lead-impacted soils at the project site. The commenter states that DTSC anticipates utilizing the EIR to comply with CEQA.

This comment has been noted and passed to decision makers.

Response 7.2

The commenter recommends a change to text in Section 4.7.3 of the Draft EIR to clarify that the project site is not included in lists identified in subsection 65962.5(a) that make up DTSC's portion of the Cortese List.

The following correction has been made on page 4.7-16 for clarification (changes shown in strikeout/underline):

~~As detailed under *Environmental Setting*~~While not listed on Government Code Section 65962.5(a), which constitutes DTSC's portion of the Cortese List, the project site is associated with an active Voluntary Agreement cleanup case with regulatory agency oversight by the DTSC (DTSC 2023a). ~~Therefore, the project site is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5.~~

Response 7.3

The commenter recommends an update to Sections 1.4 and 2.7 of the Draft EIR to clarify that the RAW is the primary decision document the DTSC is responsible for reviewing and approving for the project site.

The following revision has been made on page 1-5 for clarification (changes shown in strikeout/underline):

A responsible agency refers to a public agency other than the lead agency that has discretionary approval over the project. The Department of Toxic Substances Control (DTSC) is a responsible agency. DTSC is responsible for reviewing and approving the Removal Action Workplan (RAW) for the project site and the Soil Management Plan (SMP) for the project ~~prior to construction (grading) activities at the project site.~~ as part of the cleanup oversight process.

The following revision has been Made on page 2-12 for clarification (changes shown in strikeout/underline):

The Department of Toxic Substances Control (DTSC) is a responsible agency. DTSC is responsible for reviewing and approving the Removal Action Workplan (RAW) for the project site and the Soil Management Plan (SMP) for the project ~~prior to construction (grading) activities at the project site.~~ as part of the cleanup oversight process.

Response 7.4

The commenter notes that the RAW is still under review and will be made available for public review and comment via a mailed community update and public notice published in a local newspaper.

This comment has been noted. The commenter also states that information about the Site and the proposed cleanup activities can be viewed by visiting DTSC's EnviroStor website for 1009 - 1011 Gravenstein Highway (https://www.envirostor.dtsc.ca.gov/public/profile_report.asp?global_id=60003135). Because the RAW was under review when the Draft EIR was written, the status remains the same and no updates to the Draft EIR are required.

City of Sebastopol
Planning Department

January 22, 2024

To: Katie Green, Rincon Consultants

Re: Canopy Draft EIR public comments.

Hello Katie,

I received a phone call from Linda Berg on January 22nd, 2024 and her comments are listed below for the project.

- Where is the contaminated soil going and where is the new soil coming from? As the Charter School is a direct neighbor to the north the wind will likely blow any soil to that campus. 8.1
- What is the estimated amount of tonnage of soil being removed and replaced and what are those truck load counts. 8.2
- The project is located within a wildlife corridor of the West County Trail and that corridor does not end at the property lines. 8.3
- Requests that the applicant withdraw the application because the EIR is not in the best interest of the City and the document is full of fraud. 8.4

Sincerely,

John Jay, Associate Planner
jjay@cityofsebastopol.gov

City Hall, 7120 Bodega Avenue, Sebastopol, CA 95472
T 707-823-6167 / www.ci.sebastopol.ca.us

Letter 8 (Verbal Comment Memo)

COMMENTER: Linda Berg

DATE: January 22, 2024

Response 8.1

The commenter asks where contaminated soil from the project site will be located and where the new soil will be sourced. The commenter notes that the Charter School is located directly north of the project site.

As discussed on Page 4.8-10 of the Draft EIR, the project would implement Mitigation Measure HAZ-3a, which would require the DTSC continue to be utilized for agency oversight of assessment and remediation of the project site through completion of construction activities, and Mitigation Measure HAZ-3b, which requires the preparation of a Soil Management Plan (SMP) prior to commencement of construction and grading activities at the project site. A Removal Action Plan (referred to by the DTSC as a Removal Action Workplan) was prepared for the project site and determined soil burial, capping, and deed restriction was the recommended removal action for the project site (Stantec, 2023). Excavated contaminated soil would be buried under six feet of clean soil on top of the on-site burial cells. Soil would be provided from an offsite location.

Regarding the location of the Charter School, as discussed on page 4.7-15 of the EIR, the proposed project is located within 0.25 mile of the Sebastopol Independent Charter School. Dust control measures to limit the exposure of construction workers and public would be required. Impacts related to the project's potential to emit hazardous materials within 0.25 miles of an existing or proposed school were determined to be less than significant with the implementation of Mitigation Measure 3b (as described above). Furthermore, licensed hazardous materials transporters would be required to reach the closest designated transport route by the shortest path; US Highway 101, State Route 116 and State Route 12 are the closest designated routes. Therefore, it is unlikely transporters would be required to drive past the school while carrying hazardous materials.

Response 8.2

The commenter asks how much soil will be removed from and replaced on the project site and how many truck loads will be required to move soil.

As stated on page 4.2-13 of the Draft EIR, during Phase I construction, approximately 2,092 cubic yards of soil would be imported during the construction grading phase. In addition, approximately 1,566 cubic yards of soil would be imported during the grading phase of Phase II construction. The number of truck trips that would be required were estimated using CalEEMod (Appendix B). The CalEEMod calculations for Phase I assume a total of 262 one-way (131 round trips) truck trips would occur, and for Phase II, a total of 196 one-way (98 round trips) truck trips would occur.

Response 8.3

The commenter states that the project is located within a wildlife corridor on the West County Trail.

Refer to Response 3.7.

Response 8.4

The commenter requests that the applicant withdraw the project application and claims the Draft EIR is not in the best interest of the City and contains fraud.

This comment will be noted and passed on to decision-makers. However, expressions of opinion relating to the proposed project are not related to the adequacy of the analysis and conclusions in the EIR, and the commenter does not provide specifics regarding their claim.

From: Janet Waring <janetwaring@gmail.com>
Sent: Tuesday, January 23, 2024 10:57 AM
To: John Jay
Cc: Janet Waring
Subject: Canopy Project Comments on Draft EIR

To: John Jay, as Project Contact for the Canopy Project

Comments on the Draft Environmental Impact Report

My property is adjacent to the site. NOISE is one of my biggest concerns, both during construction and long term. I am a "noise-sensitive receptor" living on property that is directly adjacent to the project. 9.1

Short term noise:
The hours for construction are 7 am - 8 pm for the duration of the construction: several years! I am not a morning person. I am not awake at 7 am. But I will be, for several years, if you proceed as planned. This will negatively affect my health. The decibel levels are proposed to be as high as the 80s, in a clearly unacceptable range according to Sebastopol General plan. If you are going to proceed with unacceptable levels, then you must reduce the hours. 9.2

I would request that the hours be adjusted to working hours 8:00 am to 7:00 pm.. Anything more is quite unreasonable.

Long-term noise:
The sound tests you did for current 24-hour ambient noise level was done on the quietest part of the project, L1, which happens to also be my backyard. I purchased this property because of the large buffer of silence. The results of your test were 47, well below normal sound elsewhere.

However, your plan now includes putting the outdoor common recreation area in that location, which will generate noise level "Beyond typical conversation." It makes no sense to put a common recreation area into a place that is already nicely quiet..Why would you not locate that recreation area in an already noisy environment and protect some semblance of quiet. Also you have two uses for common area- one is hammock garden and seating area, which might maintain the quiet, and the other is "organic children's play area." (This is Item 6, on page 35 of the City Ventures Submitted Drawings). 9.3

I ask that you separate the two, and ensure that the playground is NOT located in the quiet area adjacent to my property.

In the draft EIR, the mitigation and comment says you do not expect the common areas to be used, but then why are you building it in the first place? Therefore, I do not agree that the noise levels are not "significant." 9.4

Other Long term noise
The mechanical and electrical units are expected to generate operational noise levels within 60 feet of my property. The high-density barrier wall to minimize impact is not clearly located to let me know that my property will be protected. Please clarify and insure that there will be protection for my adjacent property. 9.5

Letter 9

COMMENTER: Janet Waring

DATE: January 19, 2024

Response 9.1

The commenter expresses concerns about construction and operational noise and states that they are a noise-sensitive receptor living adjacent to the project site.

This comment has been noted. Impacts related to noise are addressed in Section 4.10, *Noise*, of the Draft EIR. As discussed therein, impacts related to temporary or permanent increase in ambient noise levels in the vicinity of the project would be less than significant with implementation of Mitigation Measure NOI-1, which requires a solid barrier with a height blocking the line-of-sight to the nearby noise sensitive receptors to reduce noise due to mechanical equipment. Once the final equipment selection is made, Mitigation Measure NOI-1 also requires the completion of an acoustical analysis of the noise from project mechanical and electrical equipment to surrounding properties prior to final design to verify compliance with the City's nighttime exterior noise standard of 45 dBA.

Response 9.2

The commenter states that noise levels associated with construction would be in a range inconsistent with the Sebastopol General Plan and requests that working hours be adjusted to 8:00 a.m. to 7:00 p.m.

This comment has been noted and passed on to decision makers. Noise impacts related to construction are discussed in Section 4.10, *Noise*, of the Draft EIR. As described on page 4.10-10, Section 8.25.060 of the Sebastopol Municipal Code establishes the noise level standards for residential land uses, which are consistent with the standards from the Noise Element within the City's General Plan. As described on Page 4.10-11, Item 6 within section 8.25.060 of Sebastopol's Municipal Code lists exemptions to the Noise Ordinance, including noise generated by any construction equipment which is operated during daytime hours, defined for the purposes of this section as from 7:00 a.m. to 8:00 p.m., Monday through Friday, 8:00 a.m. to 5:00 p.m. on Saturdays, and from 8:00 a.m. to 5:00 p.m. on Sundays. Therefore, the temporary noise levels associated with construction of the project would be exempt from Sebastopol's Noise Ordinance.

Response 9.3

The commenter states the opinion that 24-hour noise level measurements were taken at the quietest portion of the project site. The commenter expresses concerns about the location of the proposed common recreation area and requests that a children's play area is not located adjacent to their property.

This comment has been noted and passed on to decision makers. Noise monitoring locations were chosen to characterize ambient noise levels in the project vicinity. As described on page 4.10-12 of the Draft EIR, the proposed project would result in a significant impact if noise from project stationary operational noise sources exceeds 45 dBA Leq at a residential property line during nighttime hours between 10:00 p.m. and 7:00 a.m. or 55 dBA Leq during daytime hours between 7:00 a.m. and 10:00 p.m. HVAC and transformer operational noise source noise levels were analyzed at the nearest location to a sensitive receptor property line, as they have the greatest noise levels. All other potential noise sources would be lower and located at a further distance away. With implementation of Mitigation Measure NOI-1, noise levels from operational noise sources would be attenuated to below the City's 45 dBA Leq Nighttime Noise Standard.

The conceptual recreation area is shown on page L-4 of the project plans (available here: https://www.cityofsebastopol.gov/project/the-canopy-1009-1011-gravenstein-highway-north/#tab2). No operating hours are available at this time. Noise produced by the recreation area would be typical of a small, recreational site and consistent with the residential use of the project site. Speech levels are rated lower than the proposed mechanical equipment and would be intermittent and during daytime hours; therefore, to be more conservative, analysis was conducted using noise increases from HVAC units.

Response 9.4

The commenter asks why common areas are proposed as part of the project. The commenter states disagreement with the determination that noise level impacts are less than significant.

As discussed in Section 4.12, *Public Services*, Chapter 17.28 of the SMC requires all new residential development projects and subdivisions are required to provide park and recreation property at a minimum of five acres for each 1,000 persons within the City. As discussed in Section 4.9, *Land Use*, General Plan Policy COS 12-11 requires usable open space for residential and major commercial developments. Noise impacts are discussed in Section 4.13, *Noise*. As described therein, operational impacts would be less than significant with implementation of Mitigation Measure NOI-1.

Regarding the commenter's comment about the Draft EIR analysis assuming the common areas will not be used, while it is unclear exactly what the commenter is referring to, this may be a reference to a statement on page 18 of Appendix I, which notes that since each residential unit would have a courtyard, large gatherings are not expected to occur in the common area; therefore, impacts relating to large gatherings are assumed to be less than significant. See Response 9.3 for more information regarding speech levels.

Response 9.5

The commenter requests clarification regarding the location of high-density barriers.

This comment has been passed on to decision makers. Once the exact equipment is chosen, then exact height, density and locations will be determined to figure out how much noise attenuation (if any) will be needed at each sensitive receptor to comply with the performance standard within Mitigation Measure NOI-1.

From: tcsandymathews@gmail.com
Sent: Tuesday, January 23, 2024 8:02 PM
To: John Jay
Subject: Canopy development

Importance: High

Dear John,

I attended the Canopy meeting this evening through zoom, where it was stated that tonight was the last time that questions would be answered regarding the environmental impact of the project. We were encouraged to contact you tonight and were assured that we would receive an answer. 10.1

I have severe reservations about the movement of contaminated soil in and around the property. I live two houses down, or approximately 150-200 feet away, and this is a real concern. Please explain how that will be mitigated by the builder.

Regarding the environmental impact that the additional traffic will have on Hurlbut Ave and East Hurlbut Ave, those streets have already been destroyed by the constant cut-through traffic from Santa Rosa. 10.2

I feel like the people making the decisions could care less about the County neighbors. They talk about how this will only impact a handful of homes…but there are still people living in those homes. 10.3

Thank you,
Sandy Mathews

Sandy Mathews
992 Hurlbut Ave.
(707) 322-5757

Letter 10

COMMENTER: Sandy Mathew

DATE: January 23, 2024

Response 10.1

The commenter states that they attended the public meeting on January 23 via Zoom. The commenter expresses concerns about movement of contaminated soil and asks how it will be mitigated.

The commenter is incorrect that the public meeting on January 23 was the final time to get questions answered about the environmental impacts of the project. The project requires a recommendation from the planning commission and a decision by the City Council, during which meetings the public may comment on the project. Please refer to Response 8.1 regarding mitigation for contaminated soil.

Response 10.2

The commenter expresses concerns about traffic on Hurlbut Avenue and East Hurlbut Avenue and states that cut through traffic has destroyed those streets.

This comment has been noted and will be passed on to decision makers. Please note there are currently deed restrictions on the parcel preventing vehicular access from the project site to Hurlbut Avenue. It is owned by the County, and not owned by the City of Sebastopol. Regarding the commenter's description of the existing conditions of the roadway, existing conditions are not a result of the proposed project. Therefore, they are not an impact caused by the project and mitigation is not required.

Refer to Response 3.10 for information regarding traffic impacts.

Response 10.3

The commenter opines that decisionmakers do not care about the County neighbors.

This comment will be noted and passed on to decision-makers. However, expressions of opinion are not related to the adequacy of the analysis and conclusions in the EIR.

From: Jacob Harris <musik9000@gmail.com>
Sent: Tuesday, January 23, 2024 8:31 PM
To: John Jay
Subject: "Canopy" EIR responses for tonight (before your deadline)

To John Jay, Sebastopol City

RE: tonight's meeting responses to the EIR for the Canopy project.

Hi John, thank you for considering the neighbor's opinions and concerns regarding the Canopy Project. I just scanned the EIR and have a few comments. The below impacts as reported on the EIR do not seem accurate to me:

1. "Impact AES-3. The proposed project is in a non-urbanized area and would not substantially degrade the existing visual character or quality of public views of the site and its surroundings. Impacts would be less than significant." 11.1

My response: The quality of public views in the neighborhood due to the site would be severely impacted. This needs to be re-evaluated.

2. "Impact GHG-2. The proposed project would be consistent with goals and policies from CARB's 2022 Scoping Plan, Plan Bay Area 2050, the City's Climate Action Framework, and the General Plan. Therefore, this impact would be less than significant." 11.2

My response: as commented tonight during the meeting, clearly the proposed development is NOT consistent with the general plan. The plan's building height are more than double almost all adjacent residences. There are zero 3 story houses in the area.

3. "Impact LU-2. The project would not conflict with the goals or policies in the City's General Plan or the SMC. This impact would be less than significant." 11.3

Read #2 above for my response.

4. "Impact TRA-3. The proposed project would not introduce design features or incompatible uses that could increase traffic hazards. This impact would be less than significant." 11.4

My response. This has been mentioned to the city Council before. The amount of traffic and the egress from the planned project will definitely create traffic hazards. I am concerned that people might get seriously hurt in traffic accidents due to the layout of this project?

5. Impact UTIL-2. There are sufficient water supplies available to serve the proposed project during normal, dry, and multi-dry year conditions. Impacts would be less than significant.

My response. I am a very close neighbor to this project. I had to drill my well much deeper because the ground water has become much less available. Adding 200 inhabitants to the neighborhood will only create a huge use in water for the area. My neighbors will likely have to drill deeper Wells. This will cost hundreds of thousands of dollars. The huge influx of inhabitants will end up financially damaging the existing neighbors. 11.5

Please respond to each of my concerns and responses.

Thank You

Jacob Harris

1/23/24

8:20 pm

Letter 11

COMMENTER: Jacob Harris

DATE: January 23, 2024

Response 11.1

The commenter expresses concerns about public views as analyzed in Impact AES-3 and opines impacts to public views need to be re-evaluated.

This comment has been noted and passed on to decision makers. The commenter does not provide specific details about how the quality of public views from the project site would be impacted beyond the impacts analyzed in the Draft EIR. According to Appendix G of the CEQA Guidelines, and as analyzed in Section 4.1, *Aesthetics*, of the EIR, an impact related to public views is considered significant if development under the proposed project would result in one or more of the following conditions: In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings (public views are those that are experienced from publicly accessible vantage point). If in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality. The project site is located in a non-urbanized area. Impacts related to public views are discussed in Section 4.1, *Aesthetics*. As described under Impact AES-3, public views of the site are available from State Route 116; however, views of the site are minimized due to intervening development directly abutting State Route 116 and trees along the State Route. The project would not constitute a substantial degradation of the existing character or visual quality of the project site because the proposed development would be visually consistent with surrounding residential and commercial areas. Refer to Response 3.14 regarding more about impacts to aesthetics.

Response 11.2

Regarding Impact GHG-1 in the Draft EIR, the commenter claims that the EIR's statement that the project would be consistent with goals and policies of the 2022 Scoping Plan, Plan Bay Area 2050, the City's Climate Action Framework, and the General Plan is incorrect because the development does not appear to be consistent with the General Plan due to concerns about building heights.

Impact GHG-2 is focused on General Plan goals related to greenhouse gas emissions; impacts related to potential conflicts with the goals and policies of the City's General Plan are also discussed in Section 4.9, *Land Use*. The project's consistency with the City of Sebastopol General Plan is detailed in Table 4.9-1 and the project's consistency with SMC R7 Development Standards is shown in detail in Table 4.9-2. As described therein, the project would require approval of a State Density Bonus law waiver to increase building height from two stories to three stories. With approval of the Density Bonus, the project would be consistent with the land use and zoning designations and would not conflict with the General Plan or Municipal Code. While the project would be taller than adjacent residences, it would be consistent with the height of adjacent office buildings. Please see response 11.1 regarding design review requirements.

Response 11.3

Regarding Impact LU-2 in the Draft EIR, the commenter expresses concerns about building heights and states that the proposed project would not be consistent with the General Plan.

Please refer to Response 11.2, specifically regarding Table 4.9-2 in the Draft EIR.

Response 11.4

Regarding Impact TRA-3, the commenter expresses concerns related to traffic, egress from the project site, and safety due to the proposed layout the project site.

This comment has been noted. The commenter does not specify which features of the proposed project layout or egress would introduce safety hazards. Site access and hazards due to design features are discussed in Section 4.13, *Transportation*. As described on Page 4.13-13, the project would not introduce design features or incompatible uses that would increase traffic hazards and impacts would be less than significant.

Additionally, primary access to the site would be provided at two locations. The existing private drive links the existing office development adjacent to the project to the intersection of SR116/Mill Station Road. This intersection is controlled by a traffic signal. As shown in Table 1 of the traffic study (Appendix TRA), this intersection has an existing collision rate that is significantly less than the statewide average collision rate for similar intersections. The other access would be via the southernmost drive aisle of the office development's parking lot. A new curb cut and driveway would be created at the southernmost point of this drive aisle to provide more direct access to SR 116. On this section of SR 116, there is an existing center two-way left-turn lane (TWLTL) which would allow for "two-stage left-turn movements" for vehicles existing the project. In other words, existing traffic would make left-turn movement in two stages (left-turn into the turn lane then merge right with traffic). The TWLTL offers a higher level of safety by providing space for left-turn movement out of the flow of traffic and serving left-turn movements turning onto the main road. Therefore, the project traffic would be served by traffic facilities at both ends that offer a higher level of safety.

Refer to Response 1.1 regarding emergency response and Response 3.10 regarding traffic impacts.

Response 11.5

Regarding Impact UTIL-2, the commenter expresses concerns about groundwater demand resulting from the project and the need and cost for neighbors to dig deeper wells due to groundwater availability.

Groundwater recharge is addressed on pages 4.8-12 through 4.8-13 of the Draft EIR. As described therein, runoff from impervious surfaces would be detained in detention basins and recharged adjacent to the site, resulting in the same amount of groundwater recharge post-project as under existing conditions. Therefore, the project would not substantially interfere with groundwater recharge at the project site. Please see Response 3.11 regarding water demand and adequacy of water supply related to the project.

Regarding the potential need and cost for neighbors to dig wells, pursuant to CEQA Guidelines Section 15131, economic effects of a project shall not be treated as a significant effect on the environment. As such, formal analysis of economic impacts is not required, which includes costs associated with off-site infrastructure. Additionally, groundwater would not be pumped from the project site. The site would be served by the City of Sebastopol, and water would be pumped from existing City wells. It is the responsibility of the City to ensure its pumping actions do not adversely affect existing wells near the City-owned water supply wells.

Dear Planning Commission,

I'm writing in support of the Canopy project. It provides much needed family housing in an ideal location – close to a school, bike trail, commercial area and transportation corridor. The building plans are thoughtful and include garages, which are key for many working families. 12.1

There is good integration with the JRT and existing sidewalks on 116. I am glad to see the 6' wide sidewalk connecting 116 to the JRT.

My only comment is that is seems that instead of a gate at East Hurlbut there should be vehicle access for residents and emergency vehicles. It seems this would be prudent in case of emergency and also for ease of use for residents who live in units closer to East Hurlbut. 12.2

I am glad to see more family housing being built in Sebastopol close to a school and other public amenities. 12.3

Best,
Kate Haug

Letter 12

COMMENTER: Katie Haug

DATE: January 23, 2024

Response 12.1

The commenter expresses support for the project including its location; proximity to schools, bike trails, and transportation; building plans; and the inclusion of garages.

This comment has been noted and passed on to decision makers.

Response 12.2

The commenter recommends including vehicular access for residents and emergency vehicles at East Hurlbut instead of a gate.

This comment has been noted and passed on to decision makers. Regarding vehicular access at East Hurlbut Avenue, there are currently deed restrictions on the parcel preventing vehicular access to the project site from Hurlbut Avenue, which currently connects East Hurlbut Avenue to the project site. Additionally, a meeting was held on August 17, 2022 with the fire chief, planning team, and project applicant, to discuss road widths. The Fire Chief determined that Hurlburt Avenue would be unsuitable for use by emergency vehicles. However, more information regarding impacts relating to emergency vehicle access are discussed on Page 4.13-13 and in Appendix TRA, which determined that site access and circulation would function acceptably for emergency response vehicles and the project would have a less than significant impact on emergency response.

Response 12.3

The commenter expresses support for more family housing in Sebastopol.

This comment has been noted and passed on to decision makers.

From: Kathy O <backroad@sonic.net>
Sent: Wednesday, January 24, 2024 10:21 AM
To: John Jay
Subject: Canopy Edits & Questions

EDITS

PDF page 9
ES-1 Last Paragraph, 3rd line: "east" should be "north" …to the West County Trail 13.1

PDF page 15
ES-7 Impact AQ-2, Mitigation: None required, but Residual Impact: Less than Significant with Mitigation 13.2

PDF page 265
4.13-11 Pedestrian Facilities: 1st paragraph: "…on-site" pedestrian and bicycle features." (not on-side). 13.3

QUESTIONS

Executive Summary

Page 18 Population & Housing - Impact PS-1: Do our fire truck ladders reach 3-4 stories? 13.4

Page 19 Transportation - Impact TRA-1: Is the pedestrian path at Hurlbut open to the public, as an urban sidewalk would be open to the public for walking through, or around an adjacent neighborhood? Is there a gate? 13.5

If there is a locked gate, this is **significant** because our General Plan promotes pedestrian access and connections between neighborhoods and uses. Also, pedestrians have historically been able to walk on the the site's existing pathways accessed from other locations.

Table 2-1 page 42 Will the optional ADUs be sold/built as either ADUs or bedrooms? After purchase, could a bedroom later be converted to an ADU, or ADU back to a bedroom? 13.6

Would garages be allowed to convert to either ADUs or additional bedrooms or offices at purchase or in the future? 13.7

Letter 13

COMMENTER: Kathy Oetinger

DATE: January 23, 2024

Response 13.1

The commenter suggests that a reference to the West County Trail on Page ES-1 should state it is to the north of the project site.

Page ES-1 has been revised with the following correction (changes shown in strikeout/underline):

The project site is currently undeveloped but includes existing vegetation and mature trees. An informal pedestrian pathway bisects the site to connect the existing O'Reilly Media Center parking lot to the West County Trail, allowing use of the trail. To the ~~east~~north, the site is directly adjacent to the West County Trail, a paved trail that links Sebastopol with areas to the Northwest, including Graton and Forestville. In addition, the trail connects in downtown Sebastopol to the Joe Rodota Trail, which connect downtown Santa Rosa and Sebastopol. These trails run parallel to Highway 116 to the North of the site and along Highway 12 from eastern Sebastopol to Santa Rosa and is a popular route for cyclists and pedestrians (Sonoma County 2023). ~~(Sonoma County 2023).~~

Response 13.2

The commenter suggests there is an inconsistency regarding Impact AQ-2 on page ES-7.

The commenter is correct that there is a typo on Page ES-7.

Page ES-7 has been revised with the following correction (changes shown in strikeout/underline):

Air Quality		
Impact AQ-1. The project would not conflict with or obstruct implementation of the 2017 Clean Air Plan. Impacts would be less than significant.	None required.	Less than Significant
Impact AQ-2. Project construction and operation would not Exceed the Regional Threshold for any criteria pollutant. The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard. Impacts would be less than significant.	None required.	Less than Significant ~~with Mitigation~~

Response 13.3

The commenter suggests correcting a typo on page 4.13-11.

The commenter is correct that there is a typo on Page 4.13-11.

Page 4.13-11 has been revised with the following correction (changes shown in strikeout/underline):

Pedestrian facilities serving the project site are adequate. The paths proposed and recommended as part of the project would provide adequate access to the existing pedestrian facilities, with the exception of connectivity to the new HAWK crossing across the north leg of the intersection of SR 116/Danmar Drive. General Plan Action CIR 1f requires that development projects "provide complete streets to the extent feasible; facilitating walking, biking, and transit modes" and requires that development projects "provide appropriate ~~on-side~~on-site pedestrian and bicycle features."

Response 13.4

The commenter asks if fire truck ladders would be able to reach 3 to 4 story buildings.

The Fire Department was contacted to address this concern and the Fire Department confirmed that they would be able to fight fires at the proposed three-story height in the event of a fire.

Response 13.5

The commenter asks if the pedestrian path at Hurlbut would be open to the public or if there would be a gate. The commenter suggests that a locked gate would be contrary to the General Plan's goals to promote pedestrian access and connections between neighborhoods and users.

This comment has been noted and will be passed on to decision makers for consideration.

Response 13.6

The commenter asks if optional ADUs would be sold and built as ADUs or bedrooms and if they could be converted to one or the other after purchase.

ADU options would be selected during the purchasing contract phase. If the ADU option is not selected, then it would be a standard room which could be converted to an ADU in the future and would be subject to Zoning standards. This information and question do not pertain to the analysis or conclusions of the EIR.

Response 13.7

The commenter asks if garages could be converted to ADUs, offices, or additional bedrooms at the time of purchase or in the future.

As discussed on Page 4-3 of the Draft EIR, the project would have the potential for up to 16 units designed to potentially have a bedroom converted to an ADU. These future units would be subject to SMC 17.220.020 regarding Sebastopol's ADU ordinances. This comment does not pertain to the adequacy of the analysis in the EIR.

CALIFORNIA STATE TRANSPORTATION AGENCY GAVIN NEWSOM, GOVERNOR

California Department of Transportation

DISTRICT 4
OFFICE OF REGIONAL AND COMMUNITY PLANNING
P.O. BOX 23660, MS–10D | OAKLAND, CA 94623-0660
www.dot.ca.gov

January 24, 2024

SCH #: 2023070072
GTS #: 04-SON-2023-00849
GTS ID: 30372
Co/Rt/Pm: SON/116/25.279

John Jay, Associate Planner
City of Sebastopol
7120 Bodega Ave
Sebastopol, CA 95472

Re: The Canopy Residential Project — 1009-1011 Gravenstein Highway North – Draft Environmental Impact Report (DEIR)

Dear John Jay:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Canopy Residential Project. We are committed to ensuring that impacts to the State's multimodal transportation system and to our natural environment are identified and mitigated to support a safe, sustainable, integrated and efficient transportation system.

The Local Development Review (LDR) Program reviews land use projects and plans to ensure consistency with our mission and state planning priorities. The following comments are based on our review of the December 2023 DEIR. 14.1

Project Understanding
The proposed project would construct 80 solar all-electric, three-story townhome-style condominiums, with the potential for up to 16 American Disabilities Act (ADA) Addition Dwelling Units (ADUs). This project site is located close to State Route (SR)-116.

Travel Demand Analysis
With the enactment of Senate Bill (SB) 743, Caltrans is focused on maximizing efficient development patterns, innovative travel demand reduction strategies, and multimodal improvements. For more information on how Caltrans assesses Transportation Impact Studies, please review Caltrans' Transportation Impact Study Guide (*link*). 14.2

The project Vehicle Miles Traveled (VMT) analysis and significance determination are undertaken in a manner consistent with the Office of Planning and Research's (OPR) Technical Advisory. Per the Traffic Impact Study, this project is found to have a less than significant VMT impact, therefore working towards meeting the State's VMT reduction goals. 14.2 cont.

Project Driveway

The DEIR states that the northwest entry point would use the existing intersection at Mill Station Road, and the southwest entry point would provide access through one new curb cut connecting to Gravenstein Highway. If this southwest entry/exit point is not the driveway across Danmar Drive, please indicate this new driveway in the plan. Please refer to Highway Design Manual *(link)* 205.3 Urban Driveway for design standard. 14.3

Lead Agency

As the Lead Agency, the City is responsible for all project mitigation, including any needed improvements to the State Transportation Network (STN). The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures. 14.4

Encroachment Permit

Please be advised that any permanent work or temporary traffic control that encroaches onto Caltrans' Right-of-Way (ROW) requires a Caltrans-issued encroachment permit. If the proposed project will add a new driveway connection off SR-116, it will require an encroachment permit. As part of the encroachment permit submittal process, you may be asked by the Office of Encroachment Permits to submit a completed encroachment permit application package, digital set of plans clearly delineating Caltrans' ROW, digital copy of signed, dated and stamped (include stamp expiration date) traffic control plans, this comment letter, your response to the comment letter, and where applicable, the following items: new or amended Maintenance Agreement (MA), approved Design Standard Decision Document (DSDD), approved encroachment exception request, and/or airspace lease agreement. Your application package may be emailed to D4Permits@dot.ca.gov. 14.5

To obtain information about the most current encroachment permit process and to download the permit application, please visit Caltrans Encroachment Permits (*link*).

Thank you again for including Caltrans in the environmental review process. Should you have any questions regarding this letter, please contact Melissa Hernandez, Associate Transportation Planner, via LDR-D4@dot.ca.gov. For future early coordination opportunities or project referrals, please contact LDR-D4@dot.ca.gov.

Sincerely,

YUNSHENG LUO
Branch Chief, Local Development Review
Office of Regional and Community Planning

c: State Clearinghouse

Letter 14

COMMENTER: Yungsheng LUO Branch Chief, Local Development Review (Office of Regional and Community Planning)

DATE: January 23, 2024

Response 14.1

The commenter expresses gratitude for being included in the environmental review process for the project and describes the Local Development Review Program's role to review land use projects and ensure consistency with its mission and planning priorities.

This comment has been noted.

Response 14.2

The commenter provides information about Senate Bill 743 and states that the VMT analysis and significance determination in the Draft EIR are undertaken in a manner consistent with the Office of Planning and Research's Technical Advisory. The commenter states that the less than significant impact finding works towards meeting the State's VMT reduction goals.

This comment has been noted.

Response 14.3

The commenter requests that the new curb cut at the southwest entry/exit point described in the Draft EIR be indicated on the plans if it is different than the driveway across Danmar Avenue.

This comment has been passed on to decision makers. The proposed entrance is in a different location than the driveway across Danmar Avenue. The location of the proposed entrance is shown on page 48 of the Canopy Project Plans and Drawings which can be accessed on the City's website via this link: The-Canopy-DR-Submittal-Drawings-compressed.pdf (cityofsebastopol.gov).

Response 14.4

The commenter states that the City is responsible for all project mitigation including improvements to the State Transportation Network and that the project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures.

This comment is noted. The project does not include any mitigation regarding the State Transportation Network. The Mitigation and Monitoring Reporting Program document will include details regarding the timing, frequency, and responsibility of any mitigation measures.

Response 14.5

The commenter advises that any permanent work or temporary traffic control that encroaches onto Caltrans' Right-of-Way requires a Caltrans-issued encroachment permit including if the project will add a new driveway connection off SR-116. The commenter provides information about the encroachment permit application process.

This comment has been noted.

3 Public Hearing Comments and Responses

Verbal comments received at the public meeting (held on January 23, 2024) from the public are summarized below. The verbal comments were similar to those identified in the written letters that are responded to in Chapter 2 of this document. Several of the verbal comments made by The Commission were discussed and addressed verbally during the public meeting.

- *The commentors expressed concern about the project's consistency with the General Plan citing height requirements, density, and low-income housing requirements.*

Please see Response 11.2 regarding the project's consistency with height requirements.

Regarding the project's density and how it will meet housing-related goals, as required by Section 15126.6 of the CEQA Guidelines, the Draft EIR examines a range of reasonable alternatives to the proposed project including an alternative with reduced density and an alternative with increased density compared to the proposed project. While the EIR determined that Alternative 2 (reduced development density) would be the environmentally superior alternative, as discussed on Page 6-3, Alternative 2 would not meet goals related to increasing housing inventory as effectively as the proposed project and may not be financially feasible due to development costs. Furthermore, as discussed on Page 6-9 of the Draft EIR, transportation impacts related to vehicle miles traveled for Alternative 2 would be slightly increased compared to the proposed project since it would result in a less dense development buildout.

Regarding the comment about LU-2.4, this goal relates to the Urban Growth Boundary (UGB) administration, i.e., when a project is located within the sphere of influence of the city and not city limits. This project is within City limits and would not be subject to this goal.

- *The commenters expressed concerns about traffic including during school pick up and drop off times.*

Transportation impacts are discussed in Section 4.13, *Transportation*. As noted therein, pursuant to Section 15064.3 of the *CEQA Guidelines*, traffic delay or congestion, which is what LOS measures and describes, shall not constitute a significant environmental impact for land use projects. However, General Plan Policy CIR1-7 requires projects with potentially significant impacts to circulation to provide a circulation impact report to provide decisionmakers with a picture of the impacts associated with a project and allow decision-makers to determine appropriate improvements to alleviate traffic impacts. In addition, General Plan Policy CIR 1-8 requires review of multi-modal LOS objectives where applicable. While that information may not be used to justify a significant impact, an LOS study has been provided in detail in the Transportation Impact Study (Appendix G) for reference. Therefore, the proposed project would be consistent with all applicable General Plan policies and impacts would be less than significant.

- *The commentors expressed concerns about contaminated soils and how remediation policies will be implemented and enforced.*

As discussed on Page 4.8-10 of the Draft EIR, the project would implement Mitigation Measure HAZ-3a which would require the DTSC continue to be utilized for agency oversight of assessment and remediation of the project site through completion of construction activities and Mitigation Measure HAZ-3b which requires the preparation of a Soil Management Plan (SMP) prior to commencement of construction and grading activities at the project site. A Removal Action Plan (referred to by the DTSC as Removal Action Workplan) was prepared for the project site and determined soil burial, capping, and deed restriction was the recommended removal action for the project site (Stantec, 2023). Excavated contaminated soil would be buried under six feet of clean soil on top of the on-site burial cells.

DTSC notes that the RAW is still under review and will be made available for public review and comment via a mailed community update and public notice published in a local newspaper. Information about the Site and the proposed cleanup activities can be viewed by visiting DTSC's EnviroStor website for 1009 - 1011 Gravenstein Highway (https://www.envirostor.dtsc.ca.gov/public/profile_report.asp?global_id=60003135).

Regarding mitigation, pursuant to *CEQA Guidelines*, §15126.4, subd. (a)(2), mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instruments. In the case of the adoption of a plan, policy, regulation, or other public project, mitigation measures can be incorporated into the plan, policy, regulation, or project design. To evaluate mitigation measures, the City is including a Mitigation Monitoring or Reporting Program (MMRP) for the proposed project pursuant to *CEQA Guidelines*, §15097.

- *The commentors expressed concerns about consistency with zoning and community character, and express disagreement with the Draft EIR's description of the project site being near residential uses. The commenters request transparency from the City during the environmental review process.*

This comment has been noted and passed on to decision makers. Impacts related to land use are discussed in Section 4.9, *Land Use*. The project's consistency with the City of Sebastopol General Plan is shown in Table 4.9-1 and the project's consistency with SMC R7 Development Standards is shown in detail in Table 4.9-2. As described therein, with approval of the Density Bonus, the project would be consistent with the land use and zoning designations and would not conflict with the General Plan or Municipal Code. Please see Response 3.14 for clarification regarding existing conditions around the project site and impacts regarding community character.

- *The commentors asked if an extension could be granted for comment period.*

The minimum public review period for a Draft EIR is 45 days. The comment period for this project exceeds the minimum public review period and no extension is planned.

- *A commentor opposes the Density Bonus and waiver to allow 3-story buildings, and suggests the project should instead consist of 2-story buildings.*

This comment has been noted and passed on to decision makers for consideration. Please refer to Response 11.2 for analysis regarding proposed building heights.

- *Commentors express concerns about the existing condition of pedestrian sidewalks and future safety of pedestrians. A commenter asked if there would be a cyclist or pedestrian path around the entrance to Hurlbut Avenue.*

Existing conditions of the sidewalks would not change as a result of the proposed project. Therefore, it is not an impact caused by the project and mitigation is not required. The adequacy of pedestrian facilities is discussed on page 4.13-11. As described therein, pedestrian facilities serving the project site are adequate. The paths proposed and recommended as part of the project would provide adequate access to the existing pedestrian facilities, with the exception of connectivity to the new HAWK crossing across the north leg of the intersection of SR 116/Danmar Drive. Please see Response 4.5 regarding updates to Mitigation Measure TRA-1, which requires a new pedestrian path to link the project and mixed commercial office park to the new HAWK crossing across the north leg of the intersection of SR 116/Danmar Drive. General Plan Action CIR 1f requires that development projects "provide complete streets to the extent feasible; facilitating walking, biking, and transit modes" and requires that development projects "provide appropriate on-site pedestrian and bicycle features."

Regarding entrances to the project site, there is an option for a pedestrian path directly from the project site to Hurlbut Avenue (shown as #23 on Figure 1 below). A locked gate was added as an option that will be at the discretion of the City and it has not yet been determined if that pedestrian path will be open to the public. For the central part of the property, on the south side the project proposes a new, enhanced 6-foot-wide pedestrian pathway to connect the West County Trail to Gravenstein Highway (shown as #22 on Figure 1). The project will also include a path connection to the West County Trail just east of Mill Station Road crossing of the trail. The West County trail then provides access to Hurlbut Avenue and the other sections of the West County trail towards downtown.

Figure 1 Conceptual Site Plan

- *Commenters express concern about vehicular access to and from the project site during an emergency or evacuation scenario. A commenter also expresses concerns about vehicular access through the business park and how vehicles would access SR 116.*

Vehicular and emergency access to the project site are discussed in Section 4.13, *Transportation*. Primary access to the site would be provided at two locations: by an existing private drive that links the existing office development adjacent to the project to Mill Station Road and via the southernmost drive aisle of the office development's parking lot. A new curb cut and driveway, which would be separate from the existing driveway entrance to the business park across from Danmar, would be created at the southernmost point of this drive aisle to provide more direct access to SR 116. According to email correspondence with W-Trans on February 1, 2024, on this section of SR 116, there is an existing center two-way left-turn lane (TWLTL) which would allow for "two-stage left-turn movements" for vehicles existing the project. In other words, existing traffic would make left-turn movement in two stages (left-turn into the turn lane then merge right with traffic). The TWLTL offers a higher level of safety by providing space for left-turn movement out of the flow of traffic and serving left-turn movements turning onto the main road. Therefore, the project traffic would be served by a traffic facilities at both ends that offer a higher level of safety.

Impacts regarding emergency vehicle access are discussed on Page 4.13-13 and in Appendix TRA which determined that site access and circulation would function acceptably for emergency response vehicles and the project would have a less than significant impact on emergency response. Please see Response 1.1 for more information regarding emergency response.

Impacts related to the potential for the project to conflict with emergency response or evacuation plans are discussed on page 4.7-19 of the Draft EIR. As described therein, the proposed project would not conflict with the Emergency Operations Plan and would not impair evacuation. The proposed project does not include any characteristics (e.g., permanent road closures) that would physically impair or otherwise interfere with access to these critical routes or obstruct emergency response or evacuation in the project vicinity. Standard traffic management practices related to construction staging and parking would ensure that temporary road closures during construction would not impair or interfere with emergency response or evacuation. Furthermore, industry practices require the notification of area emergency responders prior to any such closures, ensuring that in the event of an emergency, responders and managers would already be aware of any potential obstacles related to project construction. Accordingly, potential impacts related to interference with an adopted emergency response plan or emergency evacuation plan would be less than significant.

- *Commenters expressed concerns about the project's potential to increase fire hazards to nearby properties.*

Wildfire impacts are discussed in Section 4.16, *Impacts Found to be Less than Significant*. As stated therein, the project site is not located within or near a Very High Fire Hazard Severity Zone or state responsibility area. The nearest Very High Fire Hazard Severity Zone is located approximately 3.25 miles west of the project site (CalFire 2007). As the project site is not located in or near a Very High Fire Hazard Severity Zone, no impact would occur. Regarding access emergency access to the site, the Sebastopol Fire Department was consulted to determine the appropriate location for emergency vehicle access during a meeting with the fire chief, planning team, and project applicant on August 17, 2022. Impacts regarding emergency vehicle access are discussed on Page 4.13-13 and in Appendix TRA which determined that site access and circulation would function acceptably for emergency response vehicles and the project would have a less than significant impact on emergency response. Impacts related to the potential for the project to conflict with emergency response or evacuation plans are discussed on Page 4.7-19 of the Draft EIR. As described therein, the proposed project would not conflict with the Emergency Operations Plan and would not impair evacuation.

- *A commenter expressed concerns about the project meeting applicable CalGREEN standards.*

As described on Page 4.2-15 of the Draft EIR, the proposed project would include solar and all electric appliances to the project. In addition, the proposed project would exceed the energy efficiency measures with the 2022 Title 24 Building Efficiency Standards by five to 10 percent. For example, the project would dedicate circuitry for electric vehicle charging stations for all townhome garages, which is beyond the requirement of the 2022 Title 24 Standards. The CALGreen standards are updated every three years and become increasingly more stringent over time. The proposed project would be required to comply with all water conservation standards of CALGreen that are in effect at that time. The project would include ultra-low flow water fixtures, low Impact landscaping, and onsite stormwater capture. Furthermore, as stated on Page 4.6-18 of the Draft EIR, Mitigation Measure GHG-1 requires a minimum of 15 percent of the total number of parking spaces to be equipped with EV charging stations. Energy impacts are described on page 4.16-2 of the Draft EIR. As described therein, no conflict with an applicable plan, policy or regulation adopted for the purpose of renewable energy or energy efficiency is anticipated and there would be no impact.

- *A commenter states they live at 896 Hurlbut Avenue and request information about the distance of the project site from their property line.*

This information and question do not pertain to the analysis or conclusions of the EIR. However, refer to Table 10 in Appendix I regarding this property's distance from the center of the project site.

4 Revisions to the Draft EIR

Chapter 4 presents specific changes to the text of the Draft EIR that are being made in response to comments received or to make corrections. In no case do these revisions result in a greater number of impacts or impacts of a substantially greater severity than those set forth in the Draft EIR. Where revisions to the main text are called for, the page and paragraph are set forth, followed by the appropriate revision. Added text is indicated with underlined and deleted text is indicated with ~~strikeout~~. Page numbers correspond to the page numbers of the Draft EIR. The revisions to the Draft EIR would not constitute the addition of substantial new information or a substantial increase in any environmental impacts and would not require recirculation of the Draft EIR.

Page ES-2

Table ES-2 Proposed Residential Development Summary

Feature	Details
Townhome Project Characteristics	
Residential area	69,317 square feet
Lot Coverage	Allowed: 40% or 106,333 sf Proposed: 26% or 69,317 sf +/-
~~Floor Area Ratio (FAR)~~	~~1.53[1]~~
Density	Allowed: 12.1 to 25 dwelling units/acre Proposed: 13.1 dwelling units/acre
Building Height	Allowed: 30 feet and 2 stories Proposed: 40 feet +/- and 3 stories with Density Bonus Waiver

Page ES-3

There are currently ~~133~~134 trees within the project site (including 92 protected trees), and the proposed project would involve the removal of ~~22~~43 trees (including 29 protected trees) while preserving the remaining ~~111~~91 trees (including 63 protected trees) primarily along the perimeter of the site. An existing large, mature coast live oak tree would be retained at the primary entrance to the project entry. Existing oak trees and redwoods would be preserved throughout the site. Additional trees, such as native maples, madrone and dogwood, are proposed to create onsite ecosystems that attract birds and butterflies. Proposed landscaping would include new plantings throughout the open spaces, including the paseo, at the setbacks along drive aisles, roadways, and streets, and surrounding the proposed buildings. Other amenities, including gardens, active and passive seating areas, children's play areas, and a meditation hammock garden are also proposed.

Page ES-4

As required by the California Environmental Quality Act (CEQA), this EIR examines alternatives to the proposed project. Studied alternatives include the following ~~four~~three alternatives. Based on the alternatives analysis, Alternative 2 was determined to be the environmentally superior alternative.

- Alternative 1: No Project
- Alternative 2: Reduced Development Density
- Alternative 3: Increased Development Density

Page ES-4

Alternative 1 (No Project) assumes that the proposed residential development and subsequent construction of internal roadways, parking, and associated site improvements would not occur, and that the current, undeveloped use of the site would remain. Because no construction or development would occur under the Alternative 1, the ~~22~~43 trees proposed to be removed for the project would not be removed and the existing ~~133~~134 trees on site would remain. The No Project Alternative would not meet project objectives related to increasing housing inventory to address statewide and local housing needs or provide housing opportunities for a variety of income levels and life stages within the city of Sebastopol, as residential development would not occur under this alternative.

Page ES-7

Air Quality		
Impact AQ-1. The project would not conflict with or obstruct implementation of the 2017 Clean Air Plan. Impacts would be less than significant.	None required.	Less than Significant
Impact AQ-2. Project construction and operation would not Exceed the Regional Threshold for any criteria pollutant. The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard. Impacts would be less than significant.	None required.	Less than Significant ~~with Mitigation~~

Page ES-14

HAZ-3a DTSC Regulatory Agency Submittal. The DTSC shall continue to be utilized for agency oversight of assessment and remediation of the project site through completion of grading and site construction activities. Prior to commencement of construction and grading activities at the project site, the project applicant shall submit the following documents to the DTSC project manager of the open Voluntary Agreement cleanup case:

- Current development plan and any modifications to the development plan
- All environmental documents completed for the project, including this ~~Initial Study~~ EIR document
- ~~All~~Any future environmental documents completed for the project

Upon submittal of the information above, and in accordance with the project's 2023 DTSC Standard Voluntary Agreement, DTSC may require actions such as: development of subsurface investigation workplans; completion of soil, soil vapor, and/or groundwater subsurface investigations; installation of soil vapor or groundwater monitoring wells; soil excavation and offsite disposal; completion of human health risk assessments; and/or completion of remediation reports or case closure documents. ~~Subsurface soil, soil vapor, and groundwater investigations, if required, shall be conducted in accordance with a sampling plan that shall be reviewed and approved by the DTSC.~~ The DTSC approval ~~documents~~ shall be submitted to and reviewed and accepted by the City prior to issuing grading permits.

HAZ-3b Soil Management Plan. Prior to commencement of construction and grading activities at the project site, the project applicant shall retain a qualified consultant (Professional Geologist [PG] or Professional Engineer [PE]) to prepare a Soil Management Plan (SMP) for the project site. The SMP shall address:

1. On-site handling and management of impacted soils or other impacted wastes (e.g., stained soil, and soil or groundwater with solvent or chemical odors) if such soils or impacted wastes are encountered, and
2. Specific actions to reduce hazards to construction workers and offsite receptors during the construction phase.

The SMP must establish remedial measures and soil management practices to ensure construction worker safety, the health of future workers and residents, and prevent the off-site migration of contaminants from the project site. These measures and practices may include, but are not limited to:

- Stockpile management, including stormwater pollution prevention and the installation of BMPs
- Proper disposal procedures for contaminated materials
- Investigation procedures for encountering known and unexpected odorous or visually stained soils, other indications of hydrocarbon piping or equipment, and/or debris during ground-disturbing activities
- Monitoring and reporting
- A health and safety plan for contractors working at the project site that addresses the safety and health hazards of each phase of project site construction activities with the requirements and procedures for employee protection
- The health and safety plan shall outline proper soil handling procedures and health and safety requirements to minimize worker and public exposure to hazardous materials during construction.

The DTSC shall review and approve the SMP prior to construction (grading) activities at the project site. The City shall ~~review and approve~~ confirm that DTSC has approved the ~~DTSC approved~~ SMP prior to issuing grading permits. The project applicant shall implement the SMP during grading and construction at the project site.

Page ES-16

Hydrology and Water Quality		
Impact HYD-1. Development facilitated by the project would not violate water quality standards or Waste Discharge Requirements, or otherwise substantially degrade surface or groundwater quality. Impacts would be less than significant with mitigation.	~~None required.~~ Mitigation Measure HAZ-3(a) and HAZ-3(b).	Less than Significant with Mitigation

Page ES-19

TRA-1 Pedestrian Connectivity and Safety. A new pedestrian path shall be added ~~through the center of the project site in order~~ to link the project and mixed commercial office park to the new HAWK crossing across the north leg of the intersection of SR 116/Danmar Drive ~~after Caltrans constructs the HAWK crossing and~~ before an occupancy permit is issued.

Page 1-1

The proposed project would construct 80 solar all-electric, three-story townhome-style condominiums, with the potential for up to 16 Americans with Disability Act (ADA) accessible accessory dwelling units (ADUs). Other components of the project include newly constructed internal roadways, 160 automobile parking spaces in garages and 58 automobile surface spaces across the site, and 96 bicycle parking spaces. The project would involve the removal of ~~22~~43 trees while the remaining ~~111~~91 trees would be preserved. Additional trees and amenities including gardens, active and passive seating areas, children's play areas, and a meditation hammock garden are proposed.

Page 1-5

A responsible agency refers to a public agency other than the lead agency that has discretionary approval over the project. The Department of Toxic Substances Control (DTSC) is a responsible agency. DTSC is responsible for reviewing and approving the Removal Action Workplan (RAW) for the project site and the Soil Management Plan (SMP) for the project ~~prior to construction (grading) activities at the project site.~~ as part of the cleanup oversight process.

Page 2-4

The project site is currently undeveloped but includes existing vegetation and mature trees. An informal pedestrian pathway bisects the site to connect the existing O'Reilly Media Center parking lot to the West County Trail, allowing use of the trail. To the ~~east~~north, the site is directly adjacent to the West County Trail, a paved trail that links Sebastopol with areas to the Northwest, including Graton and Forestville. In addition, the trail connects in downtown Sebastopol to the Joe Rodota Trail, which connect downtown Santa Rosa and Sebastopol. These trails run parallel to Highway 116 to the North of the site and along Highway 12 from eastern Sebastopol to Santa Rosa and is a popular route for cyclists and pedestrians (Sonoma County 2023). ~~(Sonoma County 2023).~~

Page 2-6

Table 2-1 Proposed Residential Development Summary

Feature	Details
Townhome Project Characteristics	
Residential area	69,317 square feet
Lot Coverage	Allowed: 40% or 106,333 sf Proposed: 26% or 69,317 sf +/-
~~Floor Area Ratio (FAR)~~	~~1.53[1]~~
Density	Allowed: 12.1 to 25 dwelling units/acre Proposed: 13.1 dwelling units/acre
Building Height	Allowed: 30 feet and 2 stories Proposed: 40 feet +/- and 3 stories with Density Bonus Waiver

Page 2-7

There are currently ~~133~~134 trees within the project site (including 92 protected trees), and the proposed project would involve the removal of ~~22~~43 trees (including 29 protected trees) while preserving the remaining ~~111~~91 trees (including 63 protected trees) primarily along the perimeter of the site. An existing large, mature coast live oak tree would be retained at the primary entrance to the project entry. Existing oak trees and redwoods would be preserved throughout the site. Additional trees, such as native maples, madrone and dogwood, are proposed to create onsite ecosystems that attract birds and butterflies. Proposed landscaping would include new plantings throughout the open spaces, including the paseo, at the setbacks along drive aisles, roadways, and streets, and surrounding the proposed buildings. Other amenities, including gardens, active and passive seating areas, children's play areas, and a meditation hammock garden are also proposed.

Page 2-12

2.7 Required Approvals

The proposed project would require approval of the following entitlements by the City of Sebastopol City Council:

- Conditional Use Permit for 80 townhouse units within the OLM zoning district
- A Vesting Tentative Map
- State Density Bonus law waiver to increase building height from two stories to three stories
- Site Design Review
- Removal of ~~22~~29 protected ~~existing~~ onsite trees

The Department of Toxic Substances Control (DTSC) is a responsible agency. DTSC is responsible for reviewing and approving the Removal Action Workplan (RAW) for the project site and the Soil Management Plan (SMP) for the project ~~prior to construction (grading) activities at the project site.~~ as part of the cleanup oversight process.

Page 4.1-7

General Plan Policy COS 11-8 requires all outdoor lighting to be constructed with full shielding and/or recessed to reduce light trespass to adjoining properties and to reduce illumination of the night sky and be directed downward and away from adjoining properties and public rights-of way, so that no light fixture directly illuminates an area outside of the site. Policy COS 11-~~8~~7 restricts outdoor lighting and glare from development projects to retain the quality of night skies by minimizing light pollution.

Page 4.2-1

The major large-scale weather feature controlling climate in Sebastopol is a large high-pressure system located in the eastern Pacific Ocean, known as the Pacific High. During ~~winter~~summer months, marine air trapped in the lower atmosphere is often condensed into fog by the cool Pacific Ocean. Stratus-type clouds usually form offshore and move into the area during the evening hours. During winter months, the Pacific High becomes weaker and shifts south, allowing weather systems associated with the polar jet stream to affect the region. Low pressure systems produce periods of cloudiness, strong shifting winds, and precipitation. High-pressure systems are also common in winter, with low-level inversions that produce cool stagnant conditions.

Page 4.3-13

Impact BIO-1 THE PROJECT WOULD HAVE THE POTENTIAL TO RESULT IN A SUBSTANTIAL ADVERSE EFFECT ON SPECIAL STATUS ANIMAL SPECIES. IMPACTS WOULD BE LESS THAN SIGNIFICANT WITH MITIGATION.

Page 4.13-11

Pedestrian facilities serving the project site are adequate. The paths proposed and recommended as part of the project would provide adequate access to the existing pedestrian facilities, with the exception of connectivity to the new HAWK crossing across the north leg of the intersection of SR 116/Danmar Drive. General Plan Action CIR 1f requires that development projects “provide complete streets to the extent feasible; facilitating walking, biking, and transit modes” and requires that development projects “provide appropriate ~~on-side~~on-site pedestrian and bicycle features.”

TRA-1 Pedestrian Connectivity and Safety.

A new pedestrian path shall be added ~~through the center of the project site in order~~ to link the project and mixed commercial office park to the new HAWK crossing across the north leg of the intersection of SR 116/Danmar Drive ~~after Caltrans constructs the HAWK crossing and~~ before an occupancy permit is issued.

Page 4.7-16

~~As detailed under *Environmental Setting*~~While not listed on Government Code Section 65962.5(a), which constitutes DTSC’s portion of the Cortese List, the project site is associated with an active Voluntary Agreement cleanup case with regulatory agency oversight by the DTSC (DTSC 2023a). ~~Therefore, the project site is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5.~~

Page 4.7-17

HAZ-3a DTSC Regulatory Agency Submittal. The DTSC shall continue to be utilized for agency oversight of assessment and remediation of the project site through completion of grading and site construction activities. Prior to commencement of construction and grading activities at the project site, the project applicant shall submit the following documents to the DTSC project manager of the open Voluntary Agreement cleanup case:

- Current development plan and any modifications to the development plan
- All environmental documents completed for the project, including this ~~Initial Study~~ EIR document
- ~~All~~Any future environmental documents completed for the project

Upon submittal of the information above, and in accordance with the project's 2023 DTSC Standard Voluntary Agreement, DTSC may require actions such as: development of subsurface investigation workplans; completion of soil, soil vapor, and/or groundwater subsurface investigations; installation of soil vapor or groundwater monitoring wells; soil excavation and offsite disposal; completion of human health risk assessments; and/or completion of remediation reports or case closure documents. ~~Subsurface soil, soil vapor, and groundwater investigations, if required, shall be conducted in accordance with a sampling plan that shall be reviewed and approved by the DTSC.~~ The DTSC approval ~~documents~~ shall be submitted to and reviewed and accepted by the City prior to issuing grading permits.

HAZ-3b Soil Management Plan. Prior to commencement of construction and grading activities at the project site, the project applicant shall retain a qualified consultant (Professional Geologist [PG] or Professional Engineer [PE]) to prepare a Soil Management Plan (SMP) for the project site. The SMP shall address:

1. On-site handling and management of impacted soils or other impacted wastes (e.g., stained soil, and soil or groundwater with solvent or chemical odors) if such soils or impacted wastes are encountered, and
2. Specific actions to reduce hazards to construction workers and offsite receptors during the construction phase.

The SMP must establish remedial measures and soil management practices to ensure construction worker safety, the health of future workers and residents, and prevent the off-site migration of contaminants from the project site. These measures and practices may include, but are not limited to:

- Stockpile management, including stormwater pollution prevention and the installation of BMPs
- Proper disposal procedures for contaminated materials
- Investigation procedures for encountering known and unexpected odorous or visually stained soils, other indications of hydrocarbon piping or equipment, and/or debris during ground-disturbing activities
- Monitoring and reporting
- A health and safety plan for contractors working at the project site that addresses the safety and health hazards of each phase of project site construction activities with the requirements and procedures for employee protection

- The health and safety plan shall outline proper soil handling procedures and health and safety requirements to minimize worker and public exposure to hazardous materials during construction.

The DTSC shall review and approve the SMP prior to construction (grading) activities at the project site. The City shall ~~review and approve~~ confirm that DTSC has approved the ~~DTSC approved~~ SMP prior to issuing grading permits. The project applicant shall implement the SMP during grading and construction at the project site.

Page 4.10-9

Policy N-1.13 Control non-transportation related noise from site specific noise sources to the standards shown in ~~Error! Reference source not found~~Table 4.10-3.

Page 6-2

The No Project Alternative assumes that the proposed residential development and subsequent construction of internal roadways, parking, and associated site improvements would not occur, and that the current, undeveloped use of the site would remain. Because no construction or development would occur under the Alternative 1, the ~~22~~43 trees proposed to be removed for the project would not be removed and the existing ~~133~~134 trees on site would remain. The No Project Alternative would not meet project objectives related to increasing housing inventory to address statewide and local housing needs or provide housing opportunities for a variety of income levels and life stages within the city of Sebastopol, as residential development would not occur under this alternative.

Page 6-4

The proposed project would require the removal of ~~22~~43 trees. Because Alternative 2 would involve development of fewer residential units, slightly fewer trees would need to be removed under this alternative. Similar to the proposed project, Alternative 2 would preserve the existing trees as much as possible. Tree replanting under the direction of a qualified forester, arborist, or horticulturalist pursuant to Sebastopol Municipal Code (SMC) would also be required under this alternative. Implementation of Mitigation Measure BIO-2 would be required. Impacts would be less than significant with mitigation under Alternative 2, similar to the proposed project.

Appendix B

Biological Resources Analysis

Biological Resource Analysis

"The Canopy"

Sebastopol, Sonoma County, California

Prepared for
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Prepared by

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July 2023

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ACRONYMS AND ABBREVIATIONS

AMSL	above mean sea level
BMP	best management practice
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
DPS	Distinct Population Segment
FESA	Federal Endangered Species Act
LID	Low Impact Development
MBTA	Migratory Bird Treaty Act
MND	Mitigated Negative Declaration
MS4s	municipal separate storm sewer systems
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
PBF	physical or biological features
Porter Cologne	Porter Cologne Water Quality Control Act
quad	quadrangle
Regional Water Board	Regional Water Quality Control Board
SWRCB	California State Water Resources Control Board
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDR	waste discharge requirements
WOTUS	waters of the U.S./State

1 INTRODUCTION

1.1 PURPOSE OF THE DOCUMENT

The City of Sebastopol is requiring a Biological Resource Analysis for the construction of an approximately 6.1-acre medium-density residential development (”The Canopy” [the Project]) within the City of Sebastopol, in accordance with the requirements of the California Environmental Quality Act (CEQA) (California Public Resources Code, Division 13, Section 2100 et seq.) and CEQA Guidelines (Title 14, California Code of Regulations, Chapter 3, Section 15000 et seq.). The City of Sebastopol is the CEQA Lead Agency for the Project.

The purpose of this Biological Resource Analysis is to gather information necessary to complete a review of biological resources and potential Project effects to those resources under CEQA. The analysis herein considers the Project location in conjunction with proposed work activities to analyze potential Project-related impacts on the natural environment.

1.2 PROJECT LOCATION

The 6.1-acre Gravenstein Highway Residential Project site (Project site) is located at 1003-1011 Gravenstein Highway North in Sebastopol, Sonoma County, California (Figure 1. Project Site and Vicinity Map). The site is composed of two parcels: Assessor’s Parcel Numbers 060-261-028 and 060-261-026. For the purposes of this BRA, the Project site assessed herein includes the approximately 6.1-acre Project Site is located on the northern boundary of the City of Sebastopol, Sonoma County, California (the approximate center of the Project Site is at 38°41'17.26"N, 122°84'03.34"W). The Project Site is located east of the intersection of Mill Station Road and the Gravenstein Highway. The Project Site is bound to the north by a public trail, existing residential development, and a charter school, to the south by existing residential development and an existing commercial development (including buildings and parking lots), and to the east by Hurlburt Avenue, and to the west by Gravenstein Highway.

2 PROPOSED PROJECT

2.1 PROJECT OVERVIEW

The proposed Project includes the construction of an approximately 6.1-acre residential development, with 80 townhome style condominiums, and associated infrastructure, utilities, an access road, a play area, and landscaping, as well as a 6' wide pedestrian pathway to connect the Joe Rodota Trail to Gravenstein Highway on the southern border of the site. Project implementation would include the, mass grading of the entire Project site (with the exception of locations where trees are to be protected in-place which includes the area roughly within the dripline of the trees), and construction of project components.

The Project would be constructed using typical site grading, site improvement, and Type 'V' wood-framed construction techniques per the California Building Code requirements. Project implementation would require the use of water trucks, scrapers, compactors, bulldozers, caterpillars, back-hoes, augers, concrete trucks, and assorted other hand tools and professional grade equipment.

Pending Project approval, grading is anticipated to commence in mid-2024 with Project completion proposed for late-2025. Crews typically would work during daylight hours and consistently with the City of Sebastopol's ordinances for construction. These dates and times are subject to change, pending issuance of project permits and agency authorizations.

2.2 SIGNIFICANCE THRESHOLDS FOR PROJECT IMPACTS

Potential impacts associated with implementation of the Project are addressed in the following sections. In accordance with Appendix G of the State CEQA Guidelines, Project-related impacts would be considered significant if the Project would result in one or more of the following effects:

a. 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 CDFW or USFWS; or

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS; or

c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means; or

d. 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; or

e. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

3 CURRENT CONDITION OF NATURAL ENVIRONMENT

3.1 PERSONNEL AND SURVEY DATES

3.1.1 General Site Survey

Integral Consulting Inc personnel Cameron Johnson conducted a general site survey of the Project site on May 21, 2021, to record biological resources and to assess the likelihood of resource agency regulated areas on the Project site. Sadie McGarvey and Luke Davies conducted an updated survey of the Project site on July 18, 2023, to document current site conditions. These surveys involved searching all habitats on the site and recording all plant and wildlife species observed, cross-referencing the onsite habitats against the habitat requirements of regionally known special-status species to determine suitability of the Project site to support such species.

3.2 LIMITATIONS AND ASSUMPTIONS THAT MAY INFLUENCE RESULTS

All necessary portions of the Project site were accessible to the surveying biologists. protocol rare-plant surveys have not been completed. Wildlife species, however, may be cryptic, generally difficult to detect, transient, nocturnal, or migratory species that may only occur within the Project site for short or fleeting time periods. Wildlife species may only be active during particular times of the year, such as the breeding season, or may only use the Project site temporarily. For these reasons, plant and wildlife species may be present but not observed. This limitation may influence the study results.

3.3 EXISTING CONDITIONS

The Project Site overall is relatively flat with a gentle western-facing slope, with elevations ranging from approximately 200 feet above mean sea level (AMSL) at the eastern border to approximately 190 feet AMSL at the northwestern corner of the site. The Project Site consists of a remnant apple orchard that is interspersed with native trees including coast live oak (*Quercus agrifolia*), Douglas fir (*Pseudotsuga menziesii*), valley oak (*Quercus lobata*), and Coast redwood (*Sequoia sempervirens*).

The southeastern portion of the Project site was formerly occupied by a community garden, however, at the time the July 2023 survey, the garden boxes had been removed and the site was dominated by ruderal vegetation. Ruderal vegetation is characterized by species that colonize and thrive in disturbed areas, collectively referred to as ruderal species. These species may be native or non-native, but are often thought of as “weedy” species. Dominant species included non-native herbaceous species such as bristly ox-tongue (*Helminthotheca* *echioides*), French broom (*Genista monspessulana*), wild radish (*Raphanus sativus*), and hairy cat's-ear (*Hypochaeris radicata*). Lesser dominants include non-native grasses such as slender wild oats (*Avena barbata*), rip-gut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), and foxtail barley (*Hordeum murinum*).

Overall, the Project site is highly disturbed and actively managed. At the time of the site visit, the orchard portions of the site had been recently disced and there was minimal herbaceous vegetation present, and the ruderal portion of the site had been recently mowed and there was evidence of significant weedy herbaceous vegetation present on the site prior to mowing. The edges of the Project Site are dominated by dense Himalayan blackberry (Rubus armeniacus) thickets and ruderal vegetation, in areas where the equipment could not access. A list of all observed onsite plant species is included in Table 1.

3.3.1 Soils

According to the Natural Resource Conservation Service, two soil units, or types, have been mapped on the Project Site (NRCS 2021): Goldridge fine sandy loam, 2 to 9 Percent Slopes, representing approximately 21% of the on-site soils, and Sebastopol sandy loam, 2 to 9% slopes, representing approximately 79% of the onsite soils. Goldridge fine sandy loam is listed as a hydric soil on the California Hydric Soils List for Sonoma County; Sebastapol sandy loam is not a listed hydric soil.

4 POTENTIAL IMPACTS TO SPECIAL-STATUS SPECIES

4.1 APPLICABLE LAWS

Special-status species include species considered to be rare by federal and/or state resource agencies (USFWS, National Marine Fisheries Service (NMFS), CDFW) and/or the scientific community (CNPS) and are accordingly legally protected pursuant to the federal, state, and/or local laws described below in addition to CEQA.

4.1.1 Endangered Species Act of 1973

The Endangered Species Act of 1973 (referred to as the Federal Endangered Species Act [FESA]) prohibits the "take" of any wildlife species listed by the USFWS or NMFS (collectively referred to as the Services) as threatened or endangered, including the destruction of habitat that could hinder species recovery. The term "take" is defined by FESA as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct, with habitat protected under the "harm" and "harass" definitions. The USFWS and NMFS oversee the implementation of FESA (50 Code of Federal Regulations (CFR) § 402.7, Section 305(b)(4)(B)) and have regulatory authority over listed plants, wildlife, and fish. When species are listed as endangered or threatened under FESA, the federal government is also directed to designate critical habitat for these species. To remain compliant with the FESA, federal agencies, such as USACE, are required to consult with the resource agencies prior to issuance of a permit if a project may adversely affect a federally listed species. If USACE is able to determine the project would have no effect on a listed species (when there is no potential for presence of a listed species), no additional consultation is required.

The USFWS and NMFS administer the FESA and authorize exceptions to the take provisions through issuance of Biological Opinions in consultation with the federal action agency (e.g., USACE or the Federal Emergency Management Agency). The USFWS has primary responsibility for terrestrial and freshwater organisms, whereas the responsibilities of the NMFS are mainly marine wildlife, such as whales, and anadromous fish, such as salmon.

4.1.2 Migratory Bird Treaty Act (MBTA)

The MBTA of 1918 (16 United States Code (U.S.C.) 703-712; Ch. 128; July 13, 1918; 40 Stat. 755; as amended in 1936; 1960, 1968, 1969, 1974, 1978, 1986, and 1998) (between the United States, Canada, Mexico, and Japan) prohibits the take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct) of any migratory bird or any part, nest, or egg of any such bird. The USFWS issues permits for take of migratory birds related to scientific collecting, banding and marking, falconry, raptor propagation, depredation, import, export, taxidermy, waterfowl sale and disposal, and special purposes.

4.1.3 California Endangered Species Act (CESA)

The CESA prohibits the “take” of any wildlife species listed as endangered and threatened by the State of California. The term “take” is defined by Fish and Game Code Section 86 as hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill. Section 2090 of the CESA requires state agencies to comply with regulations for protection and recovery of listed species and to promote conservation of these species. CDFW administers the CESA and authorizes exceptions to the take provisions through Section 2081 agreements (Incidental Take Permits) (except for designated “fully protected species”). Regarding rare plant species, the CESA defers to the California Native Plant Protection Act of 1977. Species that the California Fish and Game Commission has noticed as being under review for listing by CDFW are likewise given full CESA protection.

4.1.4 California Native Plant Protection Act and California Fish and Game Code (Plants)

The CNPS designates California Rare Plants through a ranking system. Ranks 1A, 1B, and 2 meet the definitions established in Section 1901, Chapter 10 (Native Plant Protection Act of 1977) or Sections 2062 and 2067 of the CESA and are eligible for state listing. Some Rank 3 and 4 plants may fall under Section 15380 of the CEQA Guidelines.

4.1.5 California Fish and Game Code (Fully Protected Species)

The State of California designated 37 species of wildlife that were rare or faced possible extinction with the classification of Fully Protected in the 1960s to provide additional protection to those species. To provide additional protections for wildlife that is rare or faces potential extinction, California Fish and Game Code Sections 3511, 4700, 5050, and 5515 designate “fully protected” status for specific birds, mammals, reptiles, amphibians, and fish. Fully protected species cannot be taken or possessed at any time and no licenses or permits can be issued for their take. Exceptions are established for scientific research collection, relocation of the bird species for the protection of livestock, and take resulting from recovery activities for state-listed species.

4.1.6 California Fish and Game Code (Birds)

California Fish and Game Code Section 3503 prohibits the take of nest or eggs of any bird. Raptors and other fully protected bird species are further protected in Sections 3503.5 and 3511, which state that these species or parts thereof may not be taken or possessed at any time.

4.1.7 CDFW Species of Special Concern

A species of special concern is an administrative designation given by CDFW to a native species that meets one or more of the following criteria: is extirpated from the state; is federally (but not state) listed; is experiencing, or formerly experienced, population declines or range restrictions; or has naturally small populations at high risk of declines. While this designation carries no legal status, CEQA Guidelines Section 15380 clearly indicates that species of special concern should be included in an analysis of project impacts.

4.2 METHODOLOGY

Information about special status species that could occur on the Project site was obtained from the following sources:

- CNDDB RareFind 5 (CDFW 2021; CDFW 2023)
- CNPS Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2023)
- Existing literature as cited in the text

The CNDDB was used to query all special-status species with known occurrences within 3 miles of the Project site. A query of the CNPS Inventory of Rare, Threatened, and Endangered Plants of California was conducted for state and federally listed and candidate species, as well as CNPS-ranked species known to occur within the same U.S. Geological Survey 7.5-Minute quadrangle (quad) as the Project site (Sebastopol quad) and/or one or more of the 8 quads surrounding the Project site, to determine additional special-status plants with potential to occur on the Project site.

The species identified in these searches were compiled in tables (Appendix A) and evaluated for likelihood of occurrence on the Project site. The potential for species to be adversely affected by the Project was classified as high, moderate, low, or none using the following definitions:

- **High:** The potential for a species to occur was considered high when the Project site was located within the range of the species, recorded observations were identified within known dispersal distance of the Project site, and suitable habitat was present on the Project site.
- **Moderate:** The potential for a species to occur was considered moderate when the Project site was located within the range of the species, recorded observations were identified nearby but outside known dispersal distance of the Project site, and suitable habitat was present on the Project site. A moderate classification was also assigned when recorded observations were identified within known dispersal distance of the Project site but habitat on the Project site was of limited or marginal quality.

- **Low:** The potential for a species to occur was considered low when the Project site was within the range of the species, but no recorded observations within known dispersal distance were identified, and habitat on the Project site was limited or of marginal quality. The potential for a species to occur was also classified as low when the Project site was located at the edge of a species' range and recorded observations were extremely rare, but habitat on the Project site was suitable.
- **None:** The potential for a species to occur was considered none when a species was not expected to occur within or adjacent to the Project site due to lack of suitable habitat and recorded observations within dispersal distance from the Project site.

4.3 SPECIAL-STATUS PLANTS IN VICINITY OF THE PROJECT SITE

According to the CNDDB and the CNPS Inventory of Rare, Threatened, and Endangered Plants of California, a total of 39 special-status plant species are known to occur in the vicinity of the Project site. All of these species require specialized habitats that *do not* occur within the Project site's ruderal and orchard vegetation communities, including chapparal, bogs and fens, marshes and swamps, meadows and seeps, riparian, coastal habitats, woodlands and forests. A brief description of each of these species is included within Appendix A (Table A-1), including the species' status, habitat, and probability of occurring on the Project site. No special-status plants have been observed onsite during general surveys.

4.4 SPECIAL-STATUS WILDLIFE IN VICINITY OF THE PROJECT SITE

According to the CNDDB and existing literature, a total of 7 special-status wildlife species are known to occur within 3 miles of the Project site. A brief description of each of these species is included in Appendix A (Table A-2), including the species' status, habitat, and probability of occurring within the Project site.

Due to lack of suitable habitat, all of the regionally known special-status wildlife species identified as occurring in the vicinity of the Project site are not expected to occur on the Project site. The routinely disturbed and actively managed ruderal and orchard habitats on the Project site do not provide necessary habitat components for these special-status species, which require the following habitat types:

- streams/rivers (Coho salmon - Central California Coast Evolutionary Significant Unit [*Oncorhynchus kisutch*], steelhead - Central California Coast Distinct Population Segment [*Oncorhynchus mykiss irideus*] and California freshwater shrimp [*Syncaris pacifica*])
- marshes/lagoons or emergent wetlands (tri-colored blackbird [*Agelaius tricolor*])

- habitats adjacent to ponds and/or streams (California giant salamander [*Dicamptodon ensatus*], western pond turtle [*Emys marmorata*], and California red-legged frog [*Rana draytonii*])
- grasslands adjacent to seasonal wetlands and ponds on the Santa Rosa Plain (California tiger salamander [*Ambystoma californiense*])

4.4.1 Special-Status Birds

The ruderal habitat and the onsite trees provide suitable nesting habitat for a variety of birds including passerines and raptors. No nests were observed onsite, however, owing to the mobile nature of birds and the seasonality of their nesting cycle, and in light of the presence of abundant suitable nesting habitat onsite, it is possible that birds could nest on the Project site during future nesting seasons.

4.5 IMPACT ASSESSMENT

4.5.1 Special-Status Birds

As part of site preparation activities, the entire Project site (with the exception of locations where trees are to be protected in-place) would be graded and compacted, and onsite shrubs and trees would be removed, resulting in permanent impacts to suitable nesting bird habitat. While it is unlikely that the Project would result in take of individual birds, active nests (i.e., nests with viable eggs and/or chicks) may be affected by Project-related activities that result in nest abandonment or destruction.

Implementation of the Mitigation Measure BIO-1, which requires preconstruction nesting bird surveys as well as monitoring of nests observed onsite until a qualified biologist determines that nesting is complete and young have fledged, would minimize potential for adverse effects on nesting birds. Accordingly, while Project implementation could result in impacts to special-status birds, these impacts would be reduced to a level considered less than significant pursuant to CEQA.

5 POTENTIAL IMPACTS TO SPECIAL-STATUS HABITATS

5.1 APPLICABLE LAWS

Aquatic resources and special status species habitats are regulated by state and federal resource agencies (USACE, California State Water Resources Control Board [SWRCB], and CDFW) and are accordingly legally protected via the federal and/or state laws defined below in addition to CEQA.

5.1.1 Section 404 Clean Water Act (CWA)

Section 404 of the CWA, administered by USACE, establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including open water. Per Section 404, a permit is required prior to discharge of fill material into waters of the United States, unless the activity is exempt from Section 404 regulation.

Waters of the United States generally include tidal waters, lakes, ponds, rivers, streams (including intermittent streams), and wetlands. Other waters are non-tidal, perennial, and intermittent watercourses and tributaries to such watercourses [33 C.F.R. 328.3(a), 51 F.R. 41250, November 13, 1986].

5.1.2 National Pollutant Discharge Elimination System (NPDES) Permit Program

The NPDES Permit Program, also authorized by the CWA, controls water pollution by regulating point sources (discrete conveyances such as pipes or constructed ditches) that discharge pollutants into waters of the United States. The implementation of this federal program has been charged to the State of California for implementation through the SWRCB and Regional Water Quality Control Boards (Regional Water Board). In California, NPDES permits are also referred to as waste discharge requirements (WDR) that regulate discharges to waters of the United States.

Also implemented by the Regional Water Board is the Municipal Storm Water Permitting Program, which regulates storm water discharges from municipal separate storm sewer systems (MS4s). The MS4 Permit Program was established to restore and maintain the chemical, physical, and biological integrity waters of the U.S./State and reduce/eliminate storm water pollution.

5.1.3 Section 401 Clean Water Act (CWA)

The SWRCB and its nine regional water boards have been charged with the protection and enhancement of water quality in the state of California. Pursuant to the Porter Cologne Water Quality Control Act (Porter Cologne), waters of the State are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state." This is generally taken to include all waters of the U.S., all surface waters not considered to be waters of the U.S. (non-jurisdictional wetlands), groundwater, and territorial seas (with territorial boundaries extending 3.0 nautical miles beyond outermost islands, reefs, and rocks and includes all waters between the islands and the coast). Per Porter Cologne, the Regional Water Board has authority to regulate discharges of fill and dredged material into Waters of the State.

5.1.4 FESA

When species are listed as endangered or threatened under FESA, the federal government is also directed to designate critical habitat for these species. Critical habitat is designated by the Services to protect areas that are essential to the survival of federally listed wildlife species. Under FESA, critical habitat is defined as a "specific geographic areas that contain features essential to the conservation of an endangered or threatened species and that may require special management and protection." When designating critical habitat, the Services focused on the principal biological or physical features in the defined area that are essential to the conservation of the listed species. These features are termed primary constituent elements. The 2016 critical habitat regulations (81 FR 7214, Feb. 11, 2016, codified at 50 CFR 402.02) replaced this term with physical or biological features (PBFs). The FESA requires Federal agencies to use their authorities to conserve endangered and threatened species and to consult USFWS and/or NMFS about actions that they carry out, fund, or authorize to ensure that they will not destroy or adversely modify critical habitat.

5.2 METHODOLOGY

Information about aquatic resources and special-status habitats that could occur on the Project site was obtained from the following sources:

- CNDDB RareFind 5 (CDFW 2021; CDFW 2023
- USFWS Critical Habitat shapefiles
- Existing literature as cited in the text

The CNDDB was used to query all special-status habitats with known occurrences within 3 miles of the Project site. USFWS shapefiles were used to map critical habitat in the vicinity of the Project site.

5.3 AQUATIC RESOURCES

The Project site does not support any potentially jurisdictional WOTUS under the jurisdiction of the USACE pursuant to the CWA (Section 404) and under the jurisdiction of the State Water Quality Control Board pursuant to the CWA (Section 401) and Porter Cologne.

5.4 CRITICAL HABITAT

The Project site does not occur within or near any designated critical habitat. A single designated critical habitat unit occurs approximately 1.2 miles east of the Project site. This critical habitat was designated for the Sonoma County California tiger salamander Distinct Population Segment (DPS) in 2011 (Federal Register 76:54346-54372)(Figure 3. Critical Habitat Map).

5.5 WILDLIFE CORRIDORS AND NURSERY SITES

The Project site does not act as a wildlife corridor or a nursery site. A wildlife corridor is a portion of land that adjoins two or more larger areas of similar natural environment, often connecting wildlife populations separated by natural or created activities, disturbances, or structures. Wildlife corridors are used for dispersal and migration of wildlife, allowing for genetic exchange, population growth, and access to larger stretches of suitable habitats, and reducing habitat fragmentation. While the Project site provides marginal resting and roosting habitat, it is isolated from adjacent parcels by development and the heavily trafficked Highway 12 and Sebastopol Road.

A nursery site is an area where juveniles occur at higher densities, avoid predation more successfully, or grow faster there than in a different habitat (Beck et. al. 2001). The Project site exhibits no evidence of being a nursery site. While suitable nesting bird habitat occurs onsite, the site's small size, disturbed condition, and location within a developed and disturbed setting preclude its use as a nursery location.

5.6 SENSITIVE NATURAL COMMUNITIES

No Sensitive Natural Communities occur on the Project site. According to the CNDDB, three Sensitive Natural Communities occur in the vicinity of the Project site: Northern Hardpan Vernal Pool, Northern Vernal Pool, and Coastal and Valley Freshwater Marsh. However, there is no evidence for any of these Sensitive Natural Communities on site. No vernal pools or marshes occur on the Project site, and these Sensitive Natural Communities likewise do not occur onsite.

Coast Live Oak, a component of Coast Live Oak Woodland and Forest Sensitive Natural Community (Code 71.060.00), occurs on the Project site. The collective definition of Coast Live Oak Woodland and Forest provided by CNPS (CNPS 2023b) includes coast live oak as a dominant or co-dominant in the upland tree canopy with big leaf maple (*Acer macrophyllum*), madrone (*Arbutus menziesii*), California black walnut (*Juglans californica*), blue oak (*Quercus douglasii*), Engelmann oak (*Quercus engelmannii*), California black oak (*Quercus kelloggii*), valley oak, and California bay (*Umbellularia californica*), with a relative canopy cover of 50%. Coast live oaks do not make up 50% or greater of the canopy cover in areas where they occur on the Project site. Accordingly, the plant community associated with the Coast Live Oak Woodland and Forest community does not occur onsite.

Waters of the State are generally likewise identified as a sensitive natural community by CDFW, however there are no waters of the State that occur on the Project site.

5.7 IMPACT ASSESSMENT

5.7.1 Waters of the U.S./State

Project implementation would not result in impacts to waters of the U.S./State.

5.7.2 Critical Habitat

Project implementation would not result in impacts to designated critical habitat.

5.7.3 Wildlife Corridors and Nursery Sites

Project implementation would not result in impacts to wildlife corridors or nursery sites.

5.7.4 Sensitive Natural Communities

Project implementation would not result in impacts to Sensitive Natural Communities.

6 APPLICABLE LOCAL PLANS, ORDINANCES, AND LAWS

6.1 SEBASTOPOL GENERAL PLAN 2035

The General Plan 2035 was adopted by the City of Sebastopol in 2016. The General Plan is the guiding document for development within the City of Sebastopol and addresses issues related to physical development, growth management, transportation services, public facilities, community design, energy efficiency, and conservation of resources through Goals and Policies that are required for projects within the City of Sebastopol Planning Area.

Additional local natural resource conservation and land use policies presented within the 2035 General Plan are applicable to the proposed Project. Only policy measures and recommendations regarding impacts to natural resources and deemed pertinent to the proposed Project are addressed in this section. Policies regarding specific project requirements such as County implementation of the review process and specific action recommendations for local, state, or federal agencies are not addressed below. Similarly, policy measures and recommendations that are clearly referring to projects or activities that are not related to the proposed Project (e.g., development on hillsides, filling and dredging of lagoons, etc.) are not addressed below.

6.1.1 Goal COS 6: Conserve, Protect, and Enhance Trees and Native Vegetation

Policy COS 6-1
Conserve existing native vegetation where possible and integrate regionally native plant species into development and infrastructure projects where appropriate.

A total of 41 trees and additional understory vegetation will be removed as part of site preparation, both native and non-native species will be included. The city of Sebastopol prescribes a replacement ratio of 2:1 for native trees with a d.b.h of at least 10 inches and non-native trees with a d.b.h of at least 20 inches. Implementation of Mitigation Measure BIO-2 below, which would include replacement of trees removed from the Project site would ensure that the Project would not result in a conflict with General Plan Policy COS 6-1.

Policy COS 6-2
Require the use of primarily locally sourced native and drought-tolerant plants and trees for landscaping on public projects, if feasible, and strongly encourage their use for landscaping on private projects.

The trees to be planted for landscaping purposes on the Project site will be native species. Landscape plans shall be approved by the City prior to issuance of building permits.

Policy COS 6-3
Avoid removal of large, mature trees that provide wildlife habitat or contribute to the visual quality of the environment through appropriate project design and building siting. If full avoidance is not possible, prioritize planting of replacement trees on-site over off-site locations. Replacement trees for high-quality mature trees should generally be of like kind, and provide for comparable habitat functionality, where appropriate site conditions exist.

A total of 41 trees as defined by the City of Sebastopol are to be removed from the project site. Implementation of Mitigation Measure BIO-2 below, which would include replacement of trees removed from the Project site would ensure that the Project would not result in a conflict with General Plan Policy COS 6-3.

Policy COS 6-4
Facilitate the preservation of existing trees, the planting of additional street trees, and the replanting of trees lost through disease, new construction or by other means.

A total of 41 trees as defined by the City of Sebastopol are to be removed from the project site. Implementation of Mitigation Measure BIO-2 below, which would include replacement of trees removed from the Project site would ensure that the Project would not result in a conflict with General Plan Policy COS 6-4.

Policy COS 6-5
Require new development to incorporate trees in landscape plans.

Native trees shall be incorporated into the landscaping plans of the development. Landscape plans shall be approved by the City prior to issuance of building permits.

6.2 SEBASTOPOL TREE ORDINANCE

The City of Sebastopol adheres to a tree ordinance (Municiple Code: Chapter 8.12 – Trees Protection) (Tree Ordinance) in order to regulate the removal of large and/or significant trees (which include heritage, protected, or street trees). For undeveloped properties, the removal, alteration (i.e., trimming), or relocation of trees 4-inch or greater in diameter requires a tree removal permit. Further, the tree ordinance requires that proposed development preserve and protect heritage trees present onsite to the greatest extent possible.

An arborist survey was conducted on the Project site by Horticultural Associates in October 2022 (Appendix B). A total of 133 trees with a diameter of 6-inches or greater were identified onsite. Project implementation would require removal of 16 Coast Live Oak, 1 valley oak, 14 Coast redwood, 2 Black Oak, 5 Douglas Fir, and 3 ornamental trees. Orchard trees such as apple and pears are not included in the arborist survey as they are not protected species and most are generally over-mature, declining, decayed or dying back. The City of Sebastopol prescribes tree replacement for all trees removed. Implementation of Mitigation Measure BIO-2 below, which would include replacement of trees removed from the Project site would ensure that the Project would not result in a conflict with the Tree Ordinance.

7 MITIGATION MEASURES

Potential impacts associated with implementation of the proposed Project are addressed below. With implementation of the specific mitigation measures recommended below, all Project-related impacts to natural resources can be reduced to a level considered less than significant.

7.1 BIOLOGICAL IMPACT 1: NESTING BIRDS

The onsite vegetation and structures provide suitable nesting habitat for various birds protected pursuant to the Migratory Bird Treaty Act and California Fish and Game Code, Sections 3503, 3503.5, and 3511. Project-related activities could result in take of protected birds in the form of disturbance causing nest abandonment or destruction. The mitigation measure presented below would reduce these impacts to a level considered less than significant pursuant to the CEQA.

7.1.1 Mitigation Measure BIO-1

Vegetation removal, ground disturbance, or structure removal (collectively referred to as construction activities) shall be scheduled to avoid the bird nesting season to the greatest extent possible. The nesting season for most birds and raptors in the San Francisco Bay Area is February 1 thought September 15.

If construction activities cannot be scheduled to occur between September 16 and January 31, pre-construction surveys for nesting birds and raptors shall be completed by a qualified ornithologist or biologist to ensure that no nests shall be disturbed during project implementation. This survey shall be completed no more than 14 days prior to the initiation of construction activities. During this survey, the qualified ornithologist/biologist shall inspect all suitable nesting habitat on the Project site and within the zone of influence (the area immediately surrounding the Project site that supports suitable nesting habitat that could be impacted by the proposed Project due to visual or auditory disturbance associated with the removal of vegetation and construction activities scheduled to occur during the nesting season)

If an active nest is found sufficiently close to the work areas to be disturbed by construction activities, the qualified ornithologist/biologist, in consultation with the California Department of Fish and Wildlife, shall determine the extent of a construction free buffer zone to be established around the nest, typically 250 feet, to ensure than protected bird and raptor nests shall not be disturbed during project construction. This buffer shall remain in place until such a time as the young have been determined (by a qualified ornithologist/biologist) to have fledged.

Prior to the initiation of construction activities, the qualified ornithologist/biologist shall submit a report indicating the results of the survey and any designated buffer zones to the satisfaction of the Director of the Planning, Building, and Code Enforcement or the Director's designee.

7.2 BIOLOGICAL IMPACT 2: TREES

A total of 41 trees would be removed from the Project site as a result of Project implementation. As such, implementation of the Project has the potential to conflict with the City of Sebastopol Tree Ordinance. The following mitigation measure would ensure that the Project does not conflict with the City of Sebastopol Tree Ordinance.

7.2.1 Mitigation Measure BIO-2

All protected ordinance-sized trees removed from the Project site shall be replaced as appropriate for the size class and species of the tree removed, based on the City of Sebastopol tree mitigation requirements for native, non-native, and orchard trees. Replacement ratios for individual trees to be removed is 2:1.). Replacement trees shall be either planted onsite or at a City-approved offsite location, or a fee of $75 per replacement tree would be provided to the City of Sebastopol tree fund in-lieu off-site tree planting in the community. If onsite/offsite planting is implemented, a replacement tree planting plan shall be approved by the City along with landscape plans prior to Project implementation.

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Table A-1. Special-Status Plant Species Known to Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Sonoma alopecurus	*Alopecurus aequalis var. sonomensis*	Federally Endangered CNPS Rank 1B.1	Freshwater marshes and swamps, and riparian scrub	This species has been recorded on the same USGS quad as the Project site (Sebastopol)	None. No marshes or swamps or riparian habitats occur on or near the Project site. The Project site does not provide suitable habitat for this species.
Vine Hill Manzanita	*Arctostaphylos densiflora*	State Endangered CNPS Rank 1B.1	Acid marine sand chaparral	This species has been recorded on the same USGS quad as the Project site (Sebastopol)	None. No chaparral occurs on or near the Project site. The Project site does not provide suitable habitat for this species.
Rincon Ridge Manzanita	*Arctostaphylos stanfordiana ssp. decumbens*	CNPS Rank 1B.1	Rhyolitic chaparral and cismontane woodland	CNPS Inventory 9-Quad Search	None. No woodlands or chaparral occur on or near the Project site. The Project site does not provide suitable habitat for this species.
Sonoma Sunshine	*Blennosperma bakeri*	Federally Endangered California Endangered CNPS Rank 1B.1	Mesic valley and foothill grassland, and vernal pools	The closest record for this species occurs approximately 1.4 miles west of the Project site (CNDDB Occurrence No. 37).	None. The project site does not provide suitable mesic habitat for this species.
Bolander's Reed Grass	*Calamagrostis bolanderi*	CNPS Rank 4.2	Bogs and fens, broadleafed upland forest, closed-cone coniferous forest, coastal scrub, mesic meadows and seeps, freshwater marshes and swamps, and North Coast coniferous forest	CNPS Inventory 9-Quad Search	None. No bogs, fens, forests, scrub, meadows, seeps, or marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Thurber's Reed Grass	*Calamagrostis crassiglumis*	CNPS Rank 2B.1	Mesic coastal scrub and freshwater marshes and swamps	CNPS Inventory 9-Quad Search	None. No marshes/swamps or scrub habitats occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Johnny-nip	*Castilleja ambigua var. ambigua*	CNPS Rank 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, and margins of vernal pools	CNPS Inventory 9-Quad Search	None. The Project site does not provide suitable habitat for this species.
Pitkin Marsh Paintbrush	*Castilleja uliginosa*	CNPS Rank 1A	Freshwater marshes and swamps	CNPS Inventory 9-Quad Search	None. No marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Rincon Ridge Ceanothus	*Ceanothus confusus*	CNPS Rank 1B.1	Closed-cone coniferous forest, chaparral, and cismontane woodland	CNPS Inventory 9-Quad Search	None. No forests, woodlands, or chaparral occur on or near the Project site. The Project site does not provide suitable habitat for this species.

Table A-1. Special-Status Plant Species Known to Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Vine Hill Ceanothus	*Ceanothus foliosus var. vineatus*	CNPS Rank 1B.1	Chaparral	CNPS Inventory 9-Quad Search	None. No chaparral occurs on or near the Project site. The Project site does not provide suitable habitat for this species.
Glory Brush	*Ceanothus gloriosus var. exaltatus*	CNPS Rank 4.3	Chaparral	CNPS Inventory 9-Quad Search	None. No chaparral occurs on or near the Project site. The Project site does not provide suitable habitat for this species.
Holly-leaved Ceanothus	*Ceanothus purpureus*	CNPS Rank 1B.2	Chaparral and cismontane woodland	CNPS Inventory 9-Quad Search	None. No woodlands or chaparral occur on or near the Project site. The Project site does not provide suitable habitat for this species.
Sonoma spineflower	*Chorizanthe valida*	Federally Endangered State Endangered CNPS Rank 1B.1	Sandy coastal prairie	This species has been recorded on the same USGS quad as the Project site (Sebastopol)	None. The Project site does not occur within the coastal region and does not provide suitable habitat for this species.
Vine Hill clarkia	*Clarkia imbricata*	Federally Endangered State Endangered CNPS Rank 1B.1	Chaparral, and valley and foothill grassland	This species has been recorded on the same USGS quad as the Project site (Sebastopol)	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Peruvian dodder	*Cuscuta obtusiflora var. glandulosa*	CNPS Rank 2B.2	Chaparral (openings), cismontane woodland, and valley and foothill grassland	CNPS Inventory 9-Quad Search	None. While the ruderal habitat occurring on the Project site provide marginal habitat for this species, this species has not been observed onsite.
Golden larkspur	*Delphinium luteum*	Federally Endangered State Rare CNPS Rank 1B.1	Chaparral, coastal prairie, and coastal scrub	This species has been recorded on the same USGS quad as the Project site (Sebastopol)	None. No chapparal or coastal region habitats occur on or near the Project site. The Project site does not provide suitable habitat for this species.
Dwarf Downingia	*Downingia pusilla*	CNPS Rank 2B.2	Mesic valley and foothill grassland, and vernal pools	The closest record for this species occurs approximately 2.0 miles south of the Project site (CNDDB Occurrence No. 86).	None. The project site does not provide suitable mesic habitat for this species.
Swamp harebell	*Eastwoodiella californica*	CNPS Rank 1B.2	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows and seeps, marshes and swamps, and North Coast coniferous forest	CNPS Inventory 9-Quad Search	None. The Project site does not provide suitable habitat for this species.
Slender cottongrass	*Eriophorum gracile*	CNPS Rank 4.3	Bogs and fens, meadows and seeps, and upper montane coniferous forest	CNPS Inventory 9-Quad Search	None. No bogs, fens, meadows, seeps, or forests occur on or near the Project site. The Project site does not provide suitable habitat for this species.

Table A-1. Special-Status Plant Species Known to Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Fragrant fritillary	*Fritillaria liliacea*	CNPS Rank 1B.2	Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland	CNPS Inventory 9-Quad Search	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Congested-headed hayfield tarplant	*Hemizonia congesta* ssp. *congesta*	CNPS Rank 1B.2	Valley and foothill grassland	The closest record for this species occurs approximately 1.0 mile west of the Project site (CNDDB Occurrence No. 27).	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Thin-lobed horkelia	*Horkelia tenuiloba*	CNPS Rank 1B.2	Broadleafed upland forest, chaparral, and valley and foothill grassland	CNPS Inventory 9-Quad Search	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Harlequin lotus	*Hosackia gracilis*	CNPS Rank 4B.2	Broadleafed upland forest, coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal prairie, coastal scrub, meadows and seeps, marshes and swamps, North Coast coniferous forest, and valley and foothill grassland	CNPS Inventory 9-Quad Search	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Coast iris	*Iris longipetala*	CNPS Rank 4B.2	Coastal prairie, lower montane coniferous forest, and meadows and seeps	CNPS Inventory 9-Quad Search	None. No prairies, forests, meadows, or seeps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Burke's goldfields	*Lasthenia burkei*	Federally Endangered State Endangered CNPS Rank 1B.1	Meadows and seeps (mesic), and vernal pools	The closest record for this species occurs approximately 1.1 miles northwest of the Project site (CNDDB Occurrence No. 28).	None. The Project site does not provide suitable mesic habitat for this species.
Baker's goldfields	*Lasthenia californica ssp. bakeri*	CNPS Rank 1B.2	Openings in closed-cone coniferous forest, coastal scrub, meadows and seeps, and marshes and swamps	CNPS Inventory 9-Quad Search	None. No forests, scrub, meadows, seeps, or marshes or swamps occur on or near the Project site. The Project site does not provide suitable habitat for this species.
Legenere	*Legenere limosa*	CNPS Rank 1B.1	Vernal pools	The closest record for this species occurs approximately 1.8 miles southwest of the Project site (CNDDB Occurrence No. 39).	None. No vernal pools occur on or near the Project site. The Project site does not provide suitable habitat for this species.

Table A-1. Special-Status Plant Species Known to Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Pitkin marsh lily	*Lilium pardalinum* ssp. *pitkinense*	Federally Endangered State Endangered CNPS Rank 1B.1	Cismontane woodland, meadows and seeps, and freshwater marshes and swamps	This species has been recorded on the same USGS quad as the Project site (Sebastopol)	None. No woodlands, meadows, seeps, or marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Sebastopol meadowfoam	*Limnanthes vinculans*	Federally Endangered State Endangered CNPS Rank 1B.1	Vernally mesic meadows and seeps, valley and foothill grassland, and vernal pools	The closest record for this species occurs approximately 0.9 mile west of the Project site (CNDDB Occurrence No. 22).	None. The Project site does not provide suitable mesic habitat for this species
Marsh microseris	*Microseris paludosa*	CNPS Rank 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland	The closest record for this species occurs approximately 2.7 miles south of the Project site (CNDDB Occurrence No. 20).	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Baker's navarretia	*Navarretia leucocephala ssp. bakeri*	CNPS Rank 1B.1	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools	The closest record for this species occurs approximately 0.9 mile west of the Project site (CNDDB Occurrence No. 21).	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Lobb's aquatic buttercup	*Ranunculus lobbii*	CNPS Rank 4B.2	Cismontane woodland, North Coast coniferous forest, valley and foothill grassland, and vernal pools	CNPS Inventory 9-Quad Search	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
White beaked-rush	*Rhynchospora alba*	CNPS Rank 2B.2	Bogs and fens, meadows and seeps, and freshwater marshes and swamps	CNPS Inventory 9-Quad Search	None. No bogs, fens, meadows, seeps, or marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
California beaked-rush	*Rhynchospora californica*	CNPS Rank 1B.1	Bogs and fens, lower montane coniferous forest, meadows and seeps, and freshwater marshes and swamps	CNPS Inventory 9-Quad Search	None. No bogs, fens, forests, meadows, seeps, or marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Brownish beaked-rush	*Rhynchospora capitellata*	CNPS Rank 2B.2	Lower montane coniferous forest, meadows and seeps, marshes and swamps, and upper montane coniferous forest	CNPS Inventory 9-Quad Search	None. No forests, meadows, seeps, or marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.
Round-headed beaked-rush	*Rhynchospora globularis*	CNPS Rank 2B.1	Freshwater marshes and swamps	CNPS Inventory 9-Quad Search	None. No marshes/swamps occur on or near the Project site. This Project site does not provide suitable habitat for this species.

Table A-1. Special-Status Plant Species Known to Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Two-fork clover	*Trifolium amoenum*	Federally Endangered CNPS Rank 1B.1	Coastal bluff scrub and valley and foothill grassland (sometimes serpentinite)	An historic record for this species occurs in the vicinity of the Project site (CNDDB Occurrence No. 20).	None. The highly disturbed and actively managed nature of the Project site precludes presence of this species.
Saline clover	*Trifolium hydrophilum*	CNPS Rank: 1B.2	Mesic soils in marshes and swamps, valley and foothill grassland, and vernal pools	The closest record for this species occurs approximately 2.5 miles west of the Project site (CNDDB Occurrence No. 16).	None. The project site does not provide suitable mesic habitat for this species.
Oval-leaved viburnum	*Viburnum ellipticum*	CNPS Rank: 2B.3	Mesic soils in marshes and swamps, valley and foothill grassland, and vernal pools	CNPS Inventory 9-Quad Search	None. The project site does not provide suitable mesic habitat for this species.

Table A-2. Special-Status Wildlife Species Known to Occur in the Vicinity of the Project Site

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Tri-colored Blackbird	*Agelaius tricolor*	California Candidate Endangered	Nests in emergent wetland with tall, dense cattails or tules, or thickets of willow, blackberry, or tall herbs	An historic record (1976) for this species is located at the Project site (CNDDB Occurrence No. 831).	None. Emergent wetlands do not occur on or near the Project site. The Project site does not provide suitable habitat for this species.
California Tiger Salamander	*Ambystoma californiense*	Federally Endangered California Threatened	Grasslands adjacent to seasonal wetlands and ponds	The closest record for this species occurs approximately 2 miles east of the Project site (CNDDB Occurrence No. 60).	None. The Project site occurs outside of the known range for this species.
California Giant Salamander	*Dicamptodon ensatus*	California Species of Special Concern	In or near streams in damp forests and riparian habitats	The closest record for this species is located approximately 2.8 miles northwest of the Project site (CNDDB Occurrence No. 221).	None. No damp forests or riparian habitats occur on or near the Project site. The Project site does not provide suitable habitat for this species.
Western Pond Turtle	*Emys marmorata*	California Species of Special Concern	A variety of habitats adjacent to permanent or nearly permanent water.	The closest record for this species is located approximately 1.2 mile east of the Project site (CNDDB Occurrence No. 682).	None. This Project site does not provide suitable habitat for this species.
Coho Salmon - Central California Coast ESU	*Oncorhynchus kisutch*	Federally Endangered	Spawn from streams and freshwater tributaries to estuarine and marine waters of the Pacific Ocean, from Punta Gorda, CA to Aptos Creek, including the San Francisco Bay and tributaries.	The closest record for this species is located approximately 3 miles northwest of the Project site (CNDDB Occurrence No. 25) in Mark West Creek.	None. No streams or rivers on the Project site. The Project site does not provide suitable habitat for this species.
California Red-Legged Frog	*Rana draytonii*	Federally Threatened California Species of Special Concern	Grassland and riparian habitats adjacent to creeks/streams with plunge pools or ponds	The closest record for this species is located approximately 2.4 miles south of the Project site (CNDDB Occurrence No. 742).	None. No streams or ponds occur on or near the Project site. The Project site does not provide suitable habitat for this species. Further, this species is not known to occur in Sebastopol.
California Freshwater Shrimp	*Syncaris pacifica*	Federally Endangered California Endangered	Perennially flowing streams with slow moving water and flat gradients	The closest record for this species is located approximately 1 mile southwest of the Project site (CNDDB Occurrence No. 9).	None. No perennially flowing streams or rivers occur on or near the Project site. The Project site does not provide suitable habitat for this species.

HORTICULTURAL Associates

Consultants in Horticulture and Arboriculture

TREE PRESERVATION AND MITIGATION REPORT

Gravenstein Village
Sebastopol, CA

Prepared For:

City Ventures
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July 18, 2019

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July 18, 2019

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Re: Updated *Tree Preservation and Mitigation Report*, Gravenstein Village, Sebastopol, California

Samantha,

Attached you will find our updated Tree Preservation and Mitigation Report for the above noted site in Sebastopol. A total of 133 trees were evaluated, and this includes all protected trees over 10 inches in trunk diameter and non-protected trees between 6 and 9 inches in diameter.

The Sebastopol Tree Ordinance requires protected trees 10 inches and greater to be included in an Arborist Report. We have also included trees 6 inches to 9 inches to be thorough. Trees of this smaller size are not protected, and 42 of the 133 in this report are in this smaller size category.

There are a number of large Acacias at this site, and this species was also not included in our Inventory because it is found on the Sebastopol 'escaped exotic' list and does not require retention.

This site is a remnant apple orchard which originated in the early 1900's, according to CEQA documents prepared in the late 1990's. Apples are also not a protected species, and most are generally over-mature, declining, decayed, or dying back. No apples were included in this Inventory.

Each tree is identified in the field with a numbered aluminum tag placed on the trunk at approximately eye level.

All trees in this report were evaluated and documented for species, size, health, and structural condition. The *Tree Inventory Chart* also includes our evaluation of the expected impacts of the proposed development and based on that impact a recommendation for preservation or removal is provided. The *Tree Location Plan* shows the location and numbering sequence of all evaluated trees.

~ Voice 707-935-3911 Fax 707-935-7103 ~

EXISTING SITE CONDITIONS SUMMARY

The project site consists of an abandoned apple orchard bordered on one side by a walking path, three sides by residential development, one side by a City street, and one side by commercial development.

EXISTING TREE SUMMARY

Native species present include Coast Live Oak, Black Oak, Douglas Fir, and Valley Oak.

California native species that have been planted as ornamentals include Coast Redwood, White Alder, and Incense Cedar.

Non-native species other than Acacia and Apple include Honey Locust, Pine, Deodar Cedar, and Chinese Pistache.

Some large off-site trees that overhang the site were also included in this inventory.

Please feel free to contact me if you have questions or if additional discussion is required.

Regards,

John C. Meserve
Consulting Arborist and Horticulturist
ISA Certified Arborist, WE #0478A
ISA Tree Risk Assessment Qualified

KEY TO TREE INVENTORY CHART

KEY TO TREE INVENTORY CHART

Gravenstein Village
Healdsburg, California

Tree Number

Each tree has been identified in the field with an aluminum tag and reference number. Tags are attached to the trunk at approximately eye level and the *Tree Location Plan* illustrates the location of each numbered tree.

Species

Each tree has been identified by genus, species and common name. Many species have more than one common name.

Trunk

Each trunk has been measured, to the nearest one-half inch, to document its diameter at 4 feet above adjacent grade. Trunk diameter is a good indicator of age, and is commonly used to determine mitigation replacement requirements.

Height

Height is estimated in feet, using visual assessment.

Radius

Radius is estimated in feet, using visual assessment. Since many canopies are asymmetrical, it is not uncommon for a radius estimate to be an average of the canopy size.

Health

The following descriptions are used to rate the health of a tree. Trees with a rating of 4 or 5 are very good candidates for preservation and will tolerate more construction impacts than trees in poorer condition. Trees with a rating of 3 may or may not be good candidates for preservation, depending on the species and expected construction impacts. Trees with a rating of 1 or 2 are generally poor candidates for preservation.

(5) Excellent - health and vigor are exceptional, no pest, disease, or distress symptoms.

(4) Good - health and vigor are average, no significant or specific distress symptoms, no significant pest or disease.

(3) Fair - health and vigor are somewhat compromised, distress is visible, pest or disease may be present and affecting health, problems are generally correctable.

(2) Marginal - health and vigor are significantly compromised, distress is highly visible and present to the degree that survivability is in question.

(1) Poor - decline has progressed beyond the point of being able to return to a healthy condition again. Long-term survival is not expected. This designation includes dead trees.

Structure

The following descriptions are used to rate the structural integrity of a tree. Trees with a rating of 3 or 4 are generally stable, sound trees which do not require significant pruning, although cleaning, thinning, or raising the canopy might be desirable. Trees with a rating of 2 are generally poor candidates for preservation unless they are preserved well away from improvements or active use areas. Significant time and effort would be required to reconstruct the canopy and improve structural integrity. Trees with a rating of 1 are hazardous and should be removed.

(4) Good structure - minor structural problems may be present which do not require corrective action.

(3) Moderate structure - normal, typical structural issues which can be corrected with pruning.

(2) Marginal structure - serious structural problems are present which may or may not be correctable with pruning, cabling, bracing, etc.

(1) Poor structure - hazardous structural condition which cannot be effectively corrected with pruning or other measures, may require removal depending on location and the presence of targets.

Expected Impacts

Considering the proximity of construction activities, type of activities, tree species, and tree condition - the following ratings are used to estimate the amount of impact on tree health and stability. Most trees will tolerate a (1) rating, many trees could tolerate a (2) rating with careful consideration and mitigation, but trees with a (3) rating are poor candidates for preservation due to their very close proximity to construction or because they are located within the footprint of construction and cannot be preserved.

(3) A significant impact on long term tree integrity can be expected as a result of proposed development.

(2) A moderate impact on long term tree integrity can be expected as a result of proposed development.

(1) A minor impact on long term tree integrity can be expected as a result of proposed development.

(0) No impact is expected

Recommendations

Recommendations are provided for removal or preservation. For those being preserved, protection measures and mitigation procedures to offset impacts and improve tree health are provided.

(1) Preservation appears to be possible.

(2) Removal is required due to significant development impacts.

(3) Removal is recommended due to poor health or hazardous structure.

(4) Removal is required due to significant development impacts and poor existing condition.

(5) Removal is recommended due to poor species characteristics.

(6) Install temporary protective fencing at the edge of the dripline, or edge of approved construction, prior to beginning grading or construction. Maintain fencing in place for duration of all construction activity in the area.

(7) Maintain existing grade within the fenced portion of the dripline. Route drainage swales and all underground work outside the dripline.

(8) Place a 4" layer of chipped bark mulch over the soil surface within the fenced dripline prior to installing temporary fencing. Maintain this layer of mulch throughout construction.

(9) Prune to clean, raise, or provide necessary clearance. Prune to reduce branches that are over-loaded, over-extended, largely horizontal, arching, or have foliage concentrated near the branch ends, per International Society of Arboriculture Pruning Standards.

Pruning to occur by, or under the supervision of, an Arborist certified by the International Society of Arboriculture. Pruning Standards are attached to this report.

TREE INVENTORY CHART

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
1	*Quercus agrifolia*	Coast Live Oak	7+9	18	12	4	3	X		3	2
2	*Quercus agrifolia*	Coast Live Oak	8.5+multiple	20	20	4	3	X		3	2
3	*Quercus agrifolia*	Coast Live Oak	10.5+13	25	20	4	3			1	1, 6, 7, 8, 9
4	*Quercus agrifolia*	Coast Live Oak	20.5	35	20	4	3			1	1, 6, 7, 8, 9
5	*Quercus agrifolia*	Coast Live Oak	7.5+5+4+4	15	9	4	3	X		1	1, 6, 7, 8, 9
6	*Quercus agrifolia*	Coast Live Oak	11.5+10+7.5+8	20	18	4	3			3	2
7	*Quercus agrifolia*	Coast Live Oak	6+multiple	15	14	4	3	X		3	2
8	*Quercus agrifolia*	Coast Live Oak	8.5	15	12	3	3	X		2	1, 6, 7, 8, 9
9	*Quercus lobata*	Valley Oak	13	40	20	4	3			3	2
10	*Quercus kelloggi*	Black Oak	13+10	30	22	4	3			3	2
11	*Quercus agrifolia*	Coast Live Oak	13+14.5	35	24	4	2		Already braced	3	2
12	*Sequoia sempervirens*	Coast Redwood	14.5	35	14	4	3			1	1, 6, 7, 8, 9
13	*Quercus agrifolia*	Coast Live Oak	16	25	18	4	3			3	2

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
14	*Sequoia sempervirens*	Coast Redwood	12	25	10	4	3			2	1, 6, 7, 8, 9
15	*Sequoia sempervirens*	Coast Redwood	15	35	11	4	3			2	1, 6, 7, 8, 9
16	*Sequoia sempervirens*	Coast Redwood	14.5	35	10	4	3			2	1, 6, 7, 8, 9
17	*Sequoia sempervirens*	Coast Redwood	16	35	11	4	3			2	1, 6, 7, 8, 9
18	*Quercus agrifolia*	Coast Live Oak	8	20	12	4	3	X		3	2
19	*Sequoia sempervirens*	Coast Redwood	8	25	9	4	3	X		2	1, 6, 7, 8, 9
20	*Sequoia sempervirens*	Coast Redwood	11.5	35	12	4	3			3	2
21	*Pseudotsuga menziesii*	Douglas Fir	±24	60	22	3	3			2	1, 6, 7, 8, 9
22	*Quercus agrifolia*	Coast Live Oak	9	12	9	3	3	X	Drought stressed in past, good new growth this season	3	2
23	*Quercus agrifolia*	Coast Live Oak	11.5	16	12	3	3		Drought stressed in past, good new growth this season	2	1, 6, 7, 8, 9
24	*Pseudotsuga menziesii*	Douglas Fir	8.5	22	10	3	3	X		2	1, 6, 7, 8, 9
25	*Quercus agrifolia*	Coast Live Oak	10	15	11	3	3		Drought stressed in past, good new growth this season	2	1, 6, 7, 8, 9
26	*Quercus kelloggi*	Black Oak	7+7	18	13	4	3	X		3	2

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
27	*Quercus agrifolia*	Douglas Fir	8+7.5	18	14	3	3	X		3	2
28	*Pseudotsuga menziesii*	Douglas Fir	8	30	11	4-3	3	X		2	1, 6, 7, 8, 9
29	*Quercus agrifolia*	Coast Live Oak	11.5	18	14	3	3		Drought stressed in past, good new growth this season	3	2
30	*Sequoia sempervirens*	Coast Redwood	15	35	11	4	3			3	2
31	*Sequoia sempervirens*	Coast Redwood	11	30	10	4	3			3	2
32	*Sequoia sempervirens*	Coast Redwood	14.5	35	12	4	3			3	2
33	*Sequoia sempervirens*	Coast Redwood	16	38	13	4	3			3	2
34	*Pseudotsuga menziesii*	Douglas Fir	7	22	9	3	3	X		1	1, 6, 7, 8, 9
35	*Pseudotsuga menziesii*	Douglas Fir	9	20	9	3	3	X		3	2
36	*Sequoia sempervirens*	Coast Redwood	17	3	11					3	2
37	*Sequoia sempervirens*	Coast Redwood	15	4	11	4	3			3	2
38	*Sequoia sempervirens*	Coast Redwood	15	35	11	4	3			3	2
39	*Sequoia sempervirens*	Coast Redwood	14	35	10	4	3			3	2

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
40	*Sequoia sempervirens*	Coast Redwood	16	40	12	4	3			3	2
41	*Sequoia sempervirens*	Coast Redwood	13	35	10	4	3			3	2
42	*Sequoia sempervirens*	Coast Redwood	15.5	35	11	4	3			3	2
43	*Sequoia sempervirens*	Coast Redwood	16	40	11	4	3			3	2
44	*Quercus agrifolia*	Coast Live Oak	14+7.5	25	18	4	3			1	1, 6, 7, 8, 9
45	*Sequoia sempervirens*	Coast Redwood	14	30	10	4	3			1	1, 6, 7, 8, 9
46	*Sequoia sempervirens*	Coast Redwood	14	35	12	4	3			1	1, 6, 7, 8, 9
47	*Quercus agrifolia*	Coast Live Oak	28	45	24	4	3		Co-dominant trunks	1	1, 6, 7, 8, 9
48	*Quercus lobata*	Valley Oak	7+5+2.5	18	11	4	3	X		1	1, 6, 7, 8, 9
49	*Quercus agrifolia*	Coast Live Oak	±6+8+8	25	16	4	3	X		1	1, 6, 7, 8, 9
50	*Quercus agrifolia*	Coast Live Oak	7.5+6+6.5+6	20	11	4	3	X		1	1, 6, 7, 8, 9
51	*Sequoia sempervirens*	Coast Redwood	12	35	11	4	3			1	1, 6, 7, 8, 9
52	*Sequoia sempervirens*	Coast Redwood	13.5	38	12	4	3			1	1, 6, 7, 8, 9

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
53	*Sequoia sempervirens*	Coast Redwood	15.5	35	12	4	3			1	1, 6, 7, 8, 9
54	*Sequoia sempervirens*	Coast Redwood	14	35	12	4	3			1	1, 6, 7, 8, 9
55	*Sequoia sempervirens*	Coast Redwood	12	30	10	4	3			1	1, 6, 7, 8, 9
56	*Quercus agrifolia*	Coast Live Oak	11.5	20	14	3	3			1	1, 6, 7, 8, 9
57	*Sequoia sempervirens*	Coast Redwood	15	35	12	4	3			1	1, 6, 7, 8, 9
58	*Sequoia sempervirens*	Coast Redwood	16	35	12	4	3			1	1, 6, 7, 8, 9
59	*Sequoia sempervirens*	Coast Redwood	15.5	35	12	4	3			1	1, 6, 7, 8, 9
60	*Sequoia sempervirens*	Coast Redwood	12.5	30	10	4	3			1	1, 6, 7, 8, 9
61	*Sequoia sempervirens*	Coast Redwood	16.5	38	14	4	3			3	2
62	*Quercus agrifolia*	Coast Live Oak	9+7.5	22	13	4	3	X		1	1, 6, 7, 8, 9
63	*Pseudotsuga menziesii*	Douglas Fir	11	30	16	4	3			1	1, 6, 7, 8, 9
64	*Pseudotsuga menziesii*	Douglas Fir	11.5	35	11	4	3			1	1, 6, 7, 8, 9
65	*Quercus agrifolia*	Coast Live Oak	9	16	12	4	3	X		1	1, 6, 7, 8, 9

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
66	*Quercus agrifolia*	Coast Live Oak	14.5	20	17	4	3			1	1, 6, 7, 8, 9
67	*Quercus agrifolia*	Coast Live Oak	11	20	16	4	3			1	1, 6, 7, 8, 9
68	*Sequoia sempervirens*	Coast Redwood	14.5	30	11	4	3			2	1, 6, 7, 8, 9
69	*Sequoia sempervirens*	Coast Redwood	12.5	30	10	4	3			2	1, 6, 7, 8, 9
70	*Sequoia sempervirens*	Coast Redwood	13	35	10	4	3			2	1, 6, 7, 8, 9
71	*Sequoia sempervirens*	Coast Redwood	11.5	30	9	4	3			1	1, 6, 7, 8, 9
72	*Sequoia sempervirens*	Coast Redwood	9	25	9	4	3	X		1	1, 6, 7, 8, 9
73	*Sequoia sempervirens*	Coast Redwood	9	26	9	4	3	X		1	1, 6, 7, 8, 9
74	*Sequoia sempervirens*	Coast Redwood	8	20	8	4	3	X		1	1, 6, 7, 8, 9
75	*Sequoia sempervirens*	Coast Redwood	6+8.5	25	8	4	3	X		1	1, 6, 7, 8, 9
76	*Quercus agrifolia*	Coast Live Oak	23	40	26	4	3			2	2
77	*Quercus agrifolia*	Coast Live Oak	26	60	26	3	3			1	1, 6, 7, 8, 9
78	*Quercus agrifolia*	Coast Live Oak	13+11+18.5+12.5+11.5	35	26	3	3			1	1, 6, 7, 8, 9

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
79	*Sequoia sempervirens*	Coast Redwood	8.5	22	9	4	3	X		1	1, 6, 7, 8, 9
80	*Quercus agrifolia*	Coast Live Oak	8+8.5	20	25	3	3	X		1	1, 6, 7, 8, 9
81	*Quercus agrifolia*	Coast Live Oak	8+16.5+12+14+15	50	25	3	3		Co-dominant trunks	1	1, 6, 7, 8, 9
82	*Quercus agrifolia*	Coast Live Oak	16	30	27	4	3			1	1, 6, 7, 8, 9
83	*Quercus agrifolia*	Coast Live Oak	22+12+22.5	50	27	3	3		Co-dominant trunks, included bark, anthracnose infection	1	1, 6, 7, 8, 9
84	*Pseudotsuga menziesii*	Douglas Fir	7	20	6	3	3	X		1	1, 6, 7, 8, 9
85	*Quercus agrifolia*	Coast Live Oak	15.5+14.5+15	40	25	3	3			1	1, 6, 7, 8, 9
86	*Sequoia sempervirens*	Coast Redwood	15	35	12	4	3			1	1, 6, 7, 8, 9
87	*Sequoia sempervirens*	Coast Redwood	11	30	10	4	3			1	1, 6, 7, 8, 9
88	*Sequoia sempervirens*	Coast Redwood	13	35	12	4	3			1	1, 6, 7, 8, 9
89	*Quercus agrifolia*	Coast Live Oak	7.5+10+6+6	25	16	3	3			1	1, 6, 7, 8, 9
90	*Quercus agrifolia*	Coast Live Oak	±8	18	12	3	3	X		1	1, 6, 7, 8, 9
91	*Quercus agrifolia*	Coast Live Oak	10.5+18	20	19	4	3			1	1, 6, 7, 8, 9

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
92	*Quercus agrifolia*	Coast Live Oak	15+10+5+11	25	18	3	3			1	1, 6, 7, 8, 9
93	*Pseudotsuga menziesii*	Douglas Fir	11.5	30	11	4	3			1	1, 6, 7, 8, 9
94	*Pseudotsuga menziesii*	Douglas Fir	10.5	30	11	3	3			1	1, 6, 7, 8, 9
95	*Quercus agrifolia*	Coast Live Oak	14+18	25	14	4	3			2	1, 6, 7, 8, 9
96	*Quercus agrifolia*	Coast Live Oak	7	18	10	4	3	X		1	1, 6, 7, 8, 9
97	*Quercus agrifolia*	Coast Live Oak	12	28	20	3	3			3	2
98	*Quercus agrifolia*	Coast Live Oak	18.5	30	22	4	3			1	1, 6, 7, 8, 9
99	*Quercus agrifolia*	Coast Live Oak	14.5+11	30	18	3	3			3	2
100	*Quercus agrifolia*	Coast Live Oak	6+8.5	20	18	4	3	X		1	1, 6, 7, 8, 9
101	*Quercus agrifolia*	Coast Live Oak	11+11+6	30	18	4	3			1	1, 6, 7, 8, 9
102	*Quercus agrifolia*	Coast Live Oak	10+13.5+12+9+13	28	24	4	3			1	1, 6, 7, 8, 9
103	*Quercus agrifolia*	Coast Live Oak	8+multiple	18	16	4	3	X		1	1, 6, 7, 8, 9
104	*Quercus agrifolia*	Coast Live Oak	6+6+5+4+5	18	12	4	3	X		3	2

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
105	*Quercus agrifolia*	Coast Live Oak	9+10+multiple	25	18	4	3			3	2
106	*Quercus agrifolia*	Coast Live Oak	8.5	20	16	4	3	X		1	1, 6, 7, 8, 9
107	*Quercus agrifolia*	Coast Live Oak	14+12.5	30	16	4	3			3	2
108	*Quercus agrifolia*	Coast Live Oak	30	30	20	4	3			1	1, 6, 7, 8, 9
109	*Quercus agrifolia*	Coast Live Oak	18+29	30	25	3	3		Co-dominant trunks, included bark, anthracnose infection	3	2
110	*Pseudotsuga menziesii*	Douglas Fir	8	20	6	4	3	X		3	2
111	*Gleditsia triacanthos*	Honey Locust	14	38	22	3	3			3	2
112	*Pinus sp.*	Pine	18	60	18	2	3		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
113	*Pinus sp.*	Pine	16	60	18	3	2		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
114	*Cedrus deodara*	Deodar Cedar	22	50	22	4	3		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
115	*Cedrus deodara*	Deodar Cedar	26	60	26	4	3		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
116	*Calocedrus decurrens*	Incense Cedar	9	18	7	4	3	X	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
117	*Salix matsudana "Tortuosa"*	Curly willow	14+ mulitiple	30	20	2	2		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

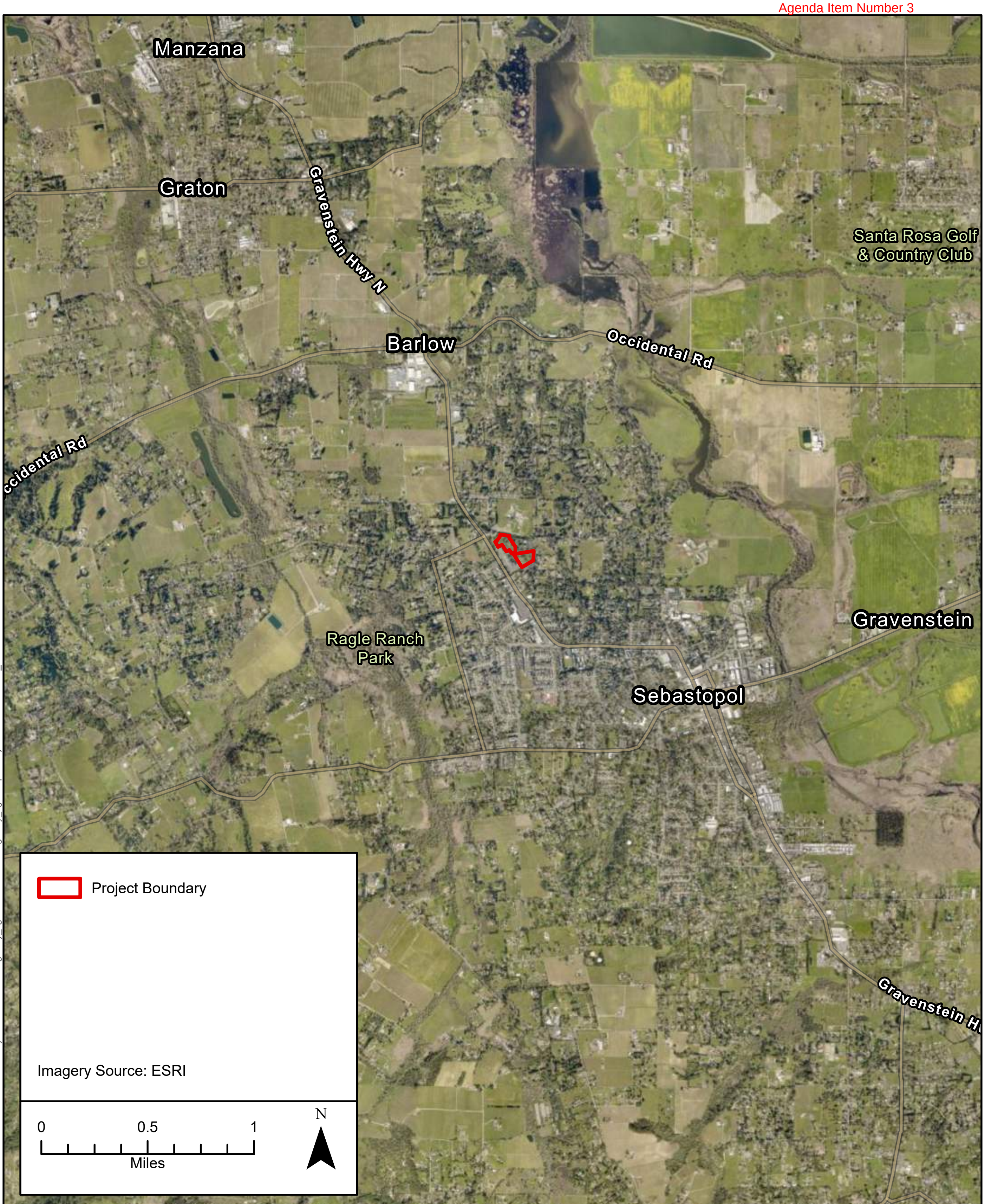
Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
118	*Gleditsia triacanthos*	Honey Locust	8	18	18	3	3	X	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
119	*Pinus radiata*	Monterey pine	30+ multiple	80	35	4	2		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
120	*Ulmus americana*	American Elm	20	25	14	3	2		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
121	*Sequoia sempervirens*	Coast Redwood	32	50	17	4	2		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
122	*Sequoia sempervirens*	Coast Redwood	9	30	10	4	3	X	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
123	*Cedrus deodara*	Deodar Cedar	9	30	12	4	3	X	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
124	*Sequoia sempervirens*	Coast Redwood	33	60	18	4	3		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
125	*Sequoia sempervirens*	Coast Redwood	36	60	18	4	3		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
126	*Cedrus deodara*	Deodar cedar	14	45	15	3	3		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
127	*Alnus rhombifolia*	Alder	10	18	8	2	2		Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
128	*Alnus rhombifolia*	Alder	7	18	5	2	1	X	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated	1	1, 6, 7, 8, 9
129	*Sequoia sempervirens*	Coast Redwood	13	25	10	4	3			1	1, 6, 7, 8, 9
130	*Pseudotsuga menziesii*	Douglas Fir	6	16	10	3	3	X		1	1, 6, 7, 8, 9

TREE INVENTORY
Gravenstein Village
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1-5)	Structure (1-4)	Not Protected	Special Notes	Expected Impact	Recommendations
131	*Pseudotsuga menziesii*	Douglas Fir	7	15	9	3	3	X		3	2
132	*Pseudotsuga menziesii*	Douglas Fir	8	16	10	3	3	X		3	2
133	*Pseudotsuga menziesii*	Douglas Fir	8	16	10	3	3	X		3	2
	Not protected trees = 9" trunk diameters or less										

TREE LOCATION PLAN


West County Trail
TREE LOCATION &
NUMBERING PLAN
Gravenstein Village
Sebastopol, CA
THIS PLAN TO BE USED IN CONJUNCTION
WITH TREE INVENTORY REPORT DATED 7/18/19



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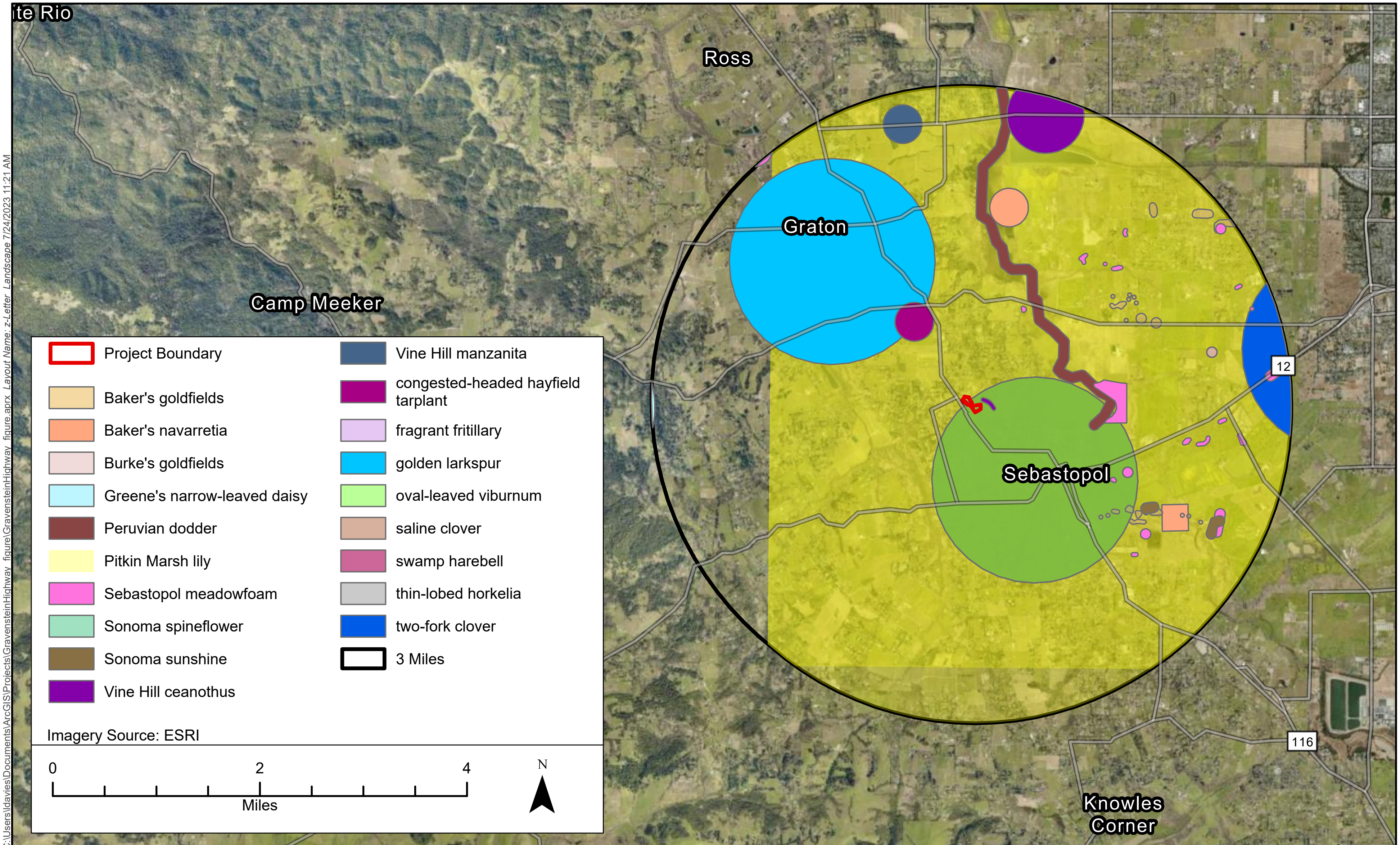
integral consulting inc.

The Canopy Project Figure 1.
Site and Vicinity Map



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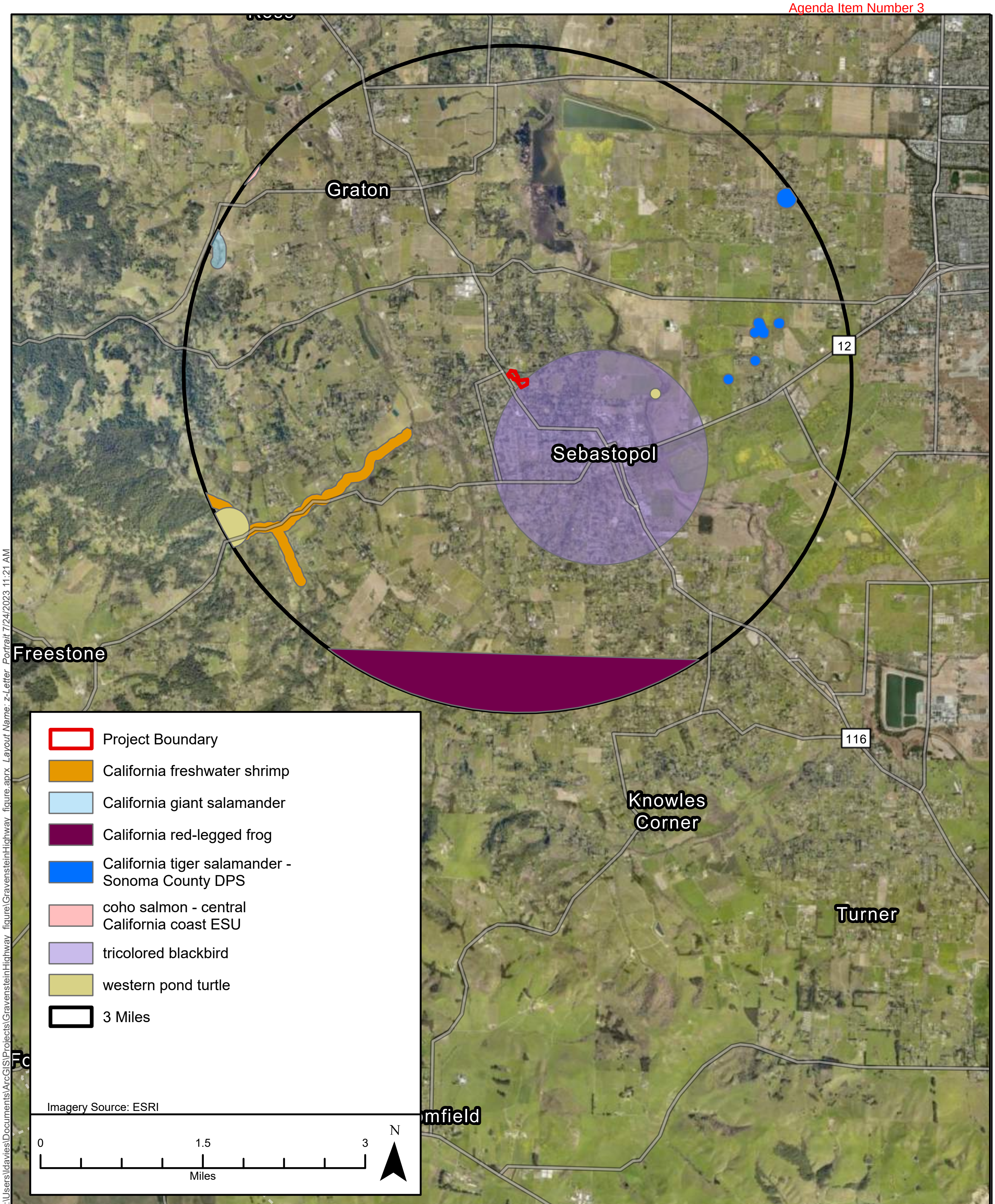
integral consulting inc.

The Canopy Project Figure 2.
Rare Plants Map



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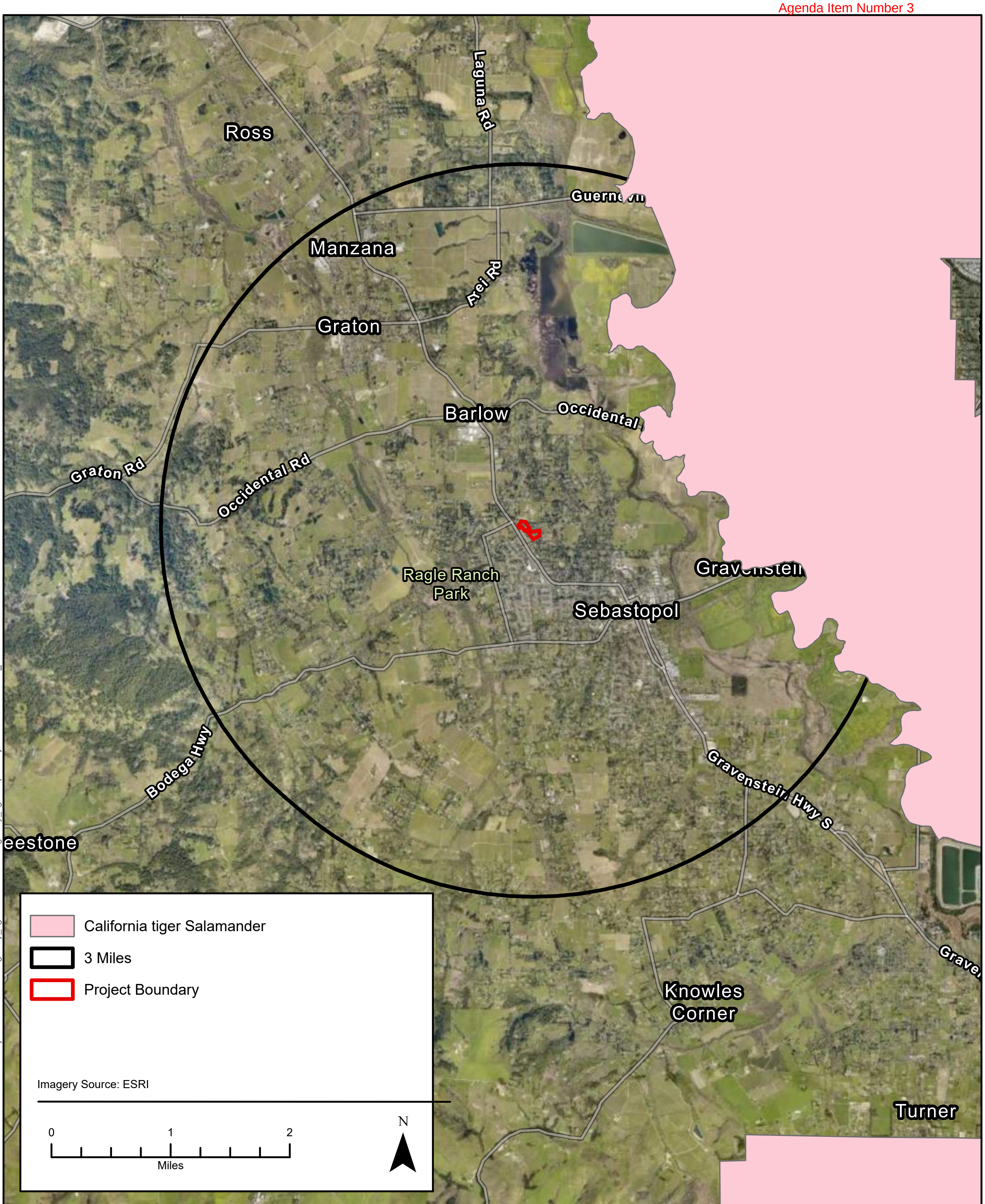
integral consulting inc.

The Canopy Project Figure 3.
CNDDB Records Map



integral consulting inc.

The Canopy Project Figure 4.
Designated Critical Habitat Map

Table 1: Plants Observed on Project Site

Scientific Name	Common Name
Acacia dealbata	silver wattle
Anthemis arvensis	Corn chamomile
Atriplex prostrata	Fat-hen
Avena barbata	Slender wild oat
Bromus diandrus	Rip-gut brome
Bromus hordeaceus	Soft chess
Carduus pycnocephalus	Italian thistle
Cichorium intybus	Chicory
Convolvulus arvensis	Orchard morning glory
Daucus pusillus	Wild carrot
Elymus caput-medusae	Medusa head
Eschscholzia californica	California poppy
Erodium botrys	Big heron bill
Geranium dissectum	Cutleaf geranium
Genista monspessulana	French Broom
Helminthotheca echioides	Bristly ox-tongue
Heterotheca grandiflora	Telegraph weed
Hirschfeldia incana	Mustard
Hordeum Murinum	Foxtail barley
Hypochaeris radicata	Hairy cats ear
Lactuca saligna	Willow lettuce
Malus domestica	Apple
Medicago polymorpha	California burclover
Navarretia leptalea	Bridges pincushionplant
Phalaris aquatica	Harding grass
Plantago lanceolata	Ribwort
Pinus radiata	Monterey pine
Plantago lanceolata	Narrow leaved plantain
Prunus persica	Peach
Pseudotsuga menziesii	Douglas fir

Quercus agrifolia	Coast live oak
Raphanus sativus	Radish
Rubus armeniacus	Himalayan blackberry
Rumex crispus	Curly dock
Salvia apiana	White sage
Senegalia greggii	Devil's claw
Sequoia sempervirens	Coast redwood
Sonchus asper	Spiny sowthistle
Solanum nigrum	Black nightshade
Taraxacum officinale	Dandelion
Toxicodendron diversilobum	Poison oak
Verbascum virgatum	Wand mullein

Appendix D

Tree Inventory Reports

HORTICULTURAL Associates

Consultants in Horticulture and Arboriculture
P.O Box 1261, Glen Ellen, CA 95442

October 25, 2022

Samantha Hauser
City Ventures
444 Spear Street, Suite 200
San Francisco, CA 94105

Re: Review of current Tree Preservation Plan; Gravenstein Highway, Sebastopol, California

Samantha,

I reviewed the latest set of project plans with regard to the preservation of existing trees at your Sebastopol project and I am providing the following observations and recommendations for your review:

1. The plan reviewed is attached. Trees highlighted in green are currently designated for preservation and trees highlighted in red are currently designated for removal.

2. I have been working with the design team to preserve as many trees as possible and the site plan has been modified several times toward this goal.

3. The larger and more visually significant trees are being preserved, including several Oaks located in interior areas of the site.

4. Most perimeter trees are being preserved and these will continue to function effectively as screening to the adjacent neighborhoods.

5. Grading details are still being worked out and trees designated for preservation are front and center in grading design. Minimal to no cut grading will be occurring in canopy driplines. Placement of minor fill within driplines will be necessary in some areas as part of pesticide residue mitigation measures. Details and specifications for this process will be determined as more information becomes available. The project arborist will be involved in preparation of these details.

6. Bike and walk paths in perimeter areas where trees are being preserved will be placed on grade and will meander around trees to the greatest extent possible. We are still working on these details.

~ Voice 707-935-3911 Fax 707-935-7103 ~

7. Design work completed to date has given the protection and preservation of trees a high priority. The plan currently under consideration acceptably protects the trees designation for preservation.

Please feel free to contact me if you have questions regarding this letter, or if further discussion would be helpful.

Regards,

John C. Meserve
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor/TRAQ
ASCA Qualified Tree and Plant Appraiser/TPAQ

HORTICULTURAL Associates

Consultants in Horticulture and Arboriculture

TREE PRESERVATION AND MITIGATION REPORT

Sebastopol A Project
Sebastopol, CA

Prepared For:

City Ventures
444 Spear Street, Suite 200
San Francisco, CA 94105

Prepared by:

John C. Meserve
International Society of Arboriculture
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor

April 10, 2019

HORTICULTURAL Associates
Consultants in Horticulture and Arboriculture
P.O Box 1261, Glen Ellen, CA 95442

April 10, 2019

Samantha Hauser
Director of Development
City Ventures
444 Spear Street, Suite 200
San Francisco, CA 94105

Re: Partial *Tree Preservation and Mitigation Report*, Sebastopol A Project, Sebastopol, California

Samantha,

Attached you will find our partial *Tree Preservation and Mitigation Report* for the above noted site in Sebastopol. A total of 132 trees were evaluated, and this includes all protected trees over 10 inches in trunk diameter and non-protected trees between 6 and 9 inches in diameter.

The Sebastopol Tree Ordinance requires protected trees 10 inches and greater to be included in an Arborist Report. We have also included trees 6 inches to 9 inches to be thorough. Trees of this smaller size are not protected, and 42 of the 132 in this report are in this smaller size category.

There are a number of large Acacias at the site, and this species was also not included in our Inventory because it is included on the Sebastopol 'escaped exotic' list and does not require retention.

This site is a remnant apple orchard which originated in the early 1900's, according to CEQA documents prepared in the late 1990's. Apples are also not a protected species, and most are generally over-mature, declining, decayed, or dying back. No apples were included in this inventory.

Each tree is identified in the field with a numbered aluminum tag placed on the trunk at approximately eye level.

All trees in this report were evaluated and documented for species, size, health, and structural condition. The *Tree Inventory Chart* does not include information about expected impacts of future development, or recommendations for action, because no solid plan has been developed yet.

The *Tree Location Plan* shows the location and numbering sequence of all evaluated trees. Protected trees are shown with white numbers and smaller non-protected trees are shown in a lighter shade.

~ Voice 707-935-3911 Fax 707-935-7103 ~

EXISTING SITE CONDITION SUMMARY

The project site consists of an abandoned apple orchard, bordered on one side by a walking path, three sides by residential development, one side by a City street, and one side by commercial development.

EXISTING TREE SUMMARY

Native species present include Coast Live Oak, Black Oak, Douglas Fir, and Valley Oak.

California native species that have been planted as ornamentals include Coast Redwood, White Alder, and Incense Cedar.

Non-native species other than Acacia and Apple include Honey Locust, Pine, Deodar Cedar, and Elm.

Some large off-site trees that overhang the site were also included in this inventory.

CONSTRUCTION IMPACT SUMMARY

No construction impact analysis is included in this study. When you have determined a final development plan we will provide an impact study for you then.

Please feel free to contact me if you have questions regarding this report, or if further discussion would be helpful.

Regards,

John C. Meserve
Consulting Arborist and Horticulturist
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor

INTERNATIONAL SOCIETY OF ARBORICULTURE
JOHN C. MESERVE
WC-0478A
Signature
CERTIFIED ARBORIST

TREE INVENTORY CHART

TREE INVENTORY
Sebastopol A Project
Sebastopol, CA

April 10, 2019

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
1	*Quercus agrifolia*	Coast Live Oak	7+9	18	12	4	3			
2	*Quercus agrifolia*	Coast Live Oak	8.5+multiple	20	20	4	3			
3	*Quercus agrifolia*	Coast Live Oak	10.5+13	25	20	4	3			
4	*Quercus agrifolia*	Coast Live Oak	20.5	35	20	4	3			
5	*Quercus agrifolia*	Coast Live Oak	7.5+5+4+4	15	9	4	3			
6	*Quercus agrifolia*	Coast Live Oak	11.5+10+7.5+8	20	18	4	3			
7	*Quercus agrifolia*	Coast Live Oak	6+multiple	15	14	4	3			
8	*Quercus agrifolia*	Coast Live Oak	8.5	15	12	3	3			
9	*Quercus lobata*	Valley Oak	13	40	20	4	3			
10	*Quercus kelloggi*	Black Oak	13+10	30	22	4	3			
11	*Quercus agrifolia*	Coast Live Oak	13+14.5	35	24	4	2	Already braced		
12	*Sequoia sempervirens*	Coast Redwood	14.5	35	14	4	3			
13	*Quercus agrifolia*	Coast Live Oak	16	25	18	4	3			
14	*Sequoia sempervirens*	Coast Redwood	12	25	10	4	3			

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
15	*Sequoia sempervirens*	Coast Redwood	15	35	11	4	3			
16	*Sequoia sempervirens*	Coast Redwood	14.5	35	10	4	3			
17	*Sequoia sempervirens*	Coast Redwood	16	35	11	4	3			
18	*Quercus agrifolia*	Coast Live Oak	8	20	12	4	3			
19	*Sequoia sempervirens*	Coast Redwood	8	25	9	4	3			
20	*Sequoia sempervirens*	Coast Redwood	11.5	35	12	4	3			
21	*Pseudotsuga menziesii*	Douglas-fir	±24	60	22	3	3			
22	*Quercus agrifolia*	Coast Live Oak	9	12	9	3	3	Drought stressed in past, good new growth this season		
23	*Quercus agrifolia*	Coast Live Oak	11.5	16	12	3	3	Drought stressed in past, good new growth this season		
24	*Pseudotsuga menziesii*	Douglas-fir	8.5	22	10	3	3			
25	*Quercus agrifolia*	Coast Live Oak	10	15	11	3	3	Drought stressed in past, good new growth this season		
26	*Quercus kelloggi*	Black Oak	7+7	18	13	4	3			
27	*Quercus agrifolia*	Coast Live Oak	8+7.5	18	14	3	3			
28	*Pseudotsuga menziesii*	Douglas-fir	8	30	11	4-3	3			

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
29	*Quercus agrifolia*	Coast Live Oak	11.5	18	14	3	3	Drought stressed in past, good new growth this season		
30	*Sequoia sempervirens*	Coast Redwood	15	35	11	4	3			
31	*Sequoia sempervirens*	Coast Redwood	11	30	10	4	3			
32	*Sequoia sempervirens*	Coast Redwood	14.5	35	12	4	3			
33	*Sequoia sempervirens*	Coast Redwood	16	38	13	4	3			
34	*Pseudotsuga menziesii*	Douglas-fir	7	22	9	3	3			
35	*Pseudotsuga menziesii*	Douglas-fir	9	20	9	3	3			
36	*Sequoia sempervirens*	Coast Redwood	17	3	11					
37	*Sequoia sempervirens*	Coast Redwood	15	4	11	4	3			
38	*Sequoia sempervirens*	Coast Redwood	15	35	11	4	3			
39	*Sequoia sempervirens*	Coast Redwood	14	35	10	4	3			
40	*Sequoia sempervirens*	Coast Redwood	16	40	12	4	3			
41	*Sequoia sempervirens*	Coast Redwood	13	35	10	4	3			
42	*Sequoia sempervirens*	Coast Redwood	15.5	35	11	4	3			

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
43	*Sequoia sempervirens*	Coast Redwood	16	40	11	4	3			
44	*Quercus agrifolia*	Coast Live Oak	14+7.5	25	18	4	3			
45	*Sequoia sempervirens*	Coast Redwood	14	30	10	4	3			
46	*Sequoia sempervirens*	Coast Redwood	14	35	12	4	3			
47	*Quercus agrifolia*	Coast Live Oak	28	45	24	4	3	Co-dominant trunks		
48	*Quercus lobata*	Valley Oak	7+5+2.5	18	11	4	3			
49	*Quercus agrifolia*	Coast Live Oak	±6+8+8	25	16	4	3			
50	*Quercus agrifolia*	Coast Live Oak	7.5+6+6.5+6	20	11	4	3			
51	*Sequoia sempervirens*	Coast Redwood	12	35	11	4	3			
52	*Sequoia sempervirens*	Coast Redwood	13.5	38	12	4	3			
53	*Sequoia sempervirens*	Coast Redwood	15.5	35	12	4	3			
54	*Sequoia sempervirens*	Coast Redwood	14	35	12	4	3			
55	*Sequoia sempervirens*	Coast Redwood	12	30	10	4	3			
56	*Quercus agrifolia*	Coast Live Oak	11.5	20	14	3	3			

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
57	*Sequoia sempervirens*	Coast Redwood	15	35	12	4	3			
58	*Sequoia sempervirens*	Coast Redwood	16	35	12	4	3			
59	*Sequoia sempervirens*	Coast Redwood	15.5	35	12	4	3			
60	*Sequoia sempervirens*	Coast Redwood	12.5	30	10	4	3			
61	*Sequoia sempervirens*	Coast Redwood	16.5	38	14	4	3			
62	*Quercus agrifolia*	Coast Live Oak	9+7.5	22	13	4	3			
63	*Pseudotsuga menziesii*	Douglas-fir	11	30	16	4	3			
64	*Pseudotsuga menziesii*	Douglas-fir	11.5	35	11	4	3			
65	*Quercus agrifolia*	Coast Live Oak	9	16	12	4	3			
66	*Quercus agrifolia*	Coast Live Oak	14.5	20	17	4	3			
67	*Quercus agrifolia*	Coast Live Oak	11	20	16	4	3			
68	*Sequoia sempervirens*	Coast Redwood	14.5	30	11	4	3			
69	*Sequoia sempervirens*	Coast Redwood	12.5	30	10	4	3			
70	*Sequoia sempervirens*	Coast Redwood	13	35	10	4	3			

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)		Special Notes	Expected Impact	Recommendations
71	*Sequoia sempervirens*	Coast Redwood	11.5	30	9	4	3			
72	*Sequoia sempervirens*	Coast Redwood	9	25	9	4	3			
73	*Sequoia sempervirens*	Coast Redwood	9	26	9	4	3			
74	*Sequoia sempervirens*	Coast Redwood	8	20	8	4	3			
75	*Sequoia sempervirens*	Coast Redwood	6+8.5	25	8	4	3			
76	*Quercus agrifolia*	Coast Live Oak	23	40	26	4	3			
77	*Quercus agrifolia*	Coast Live Oak	26	60	26	3	3			
78	*Quercus agrifolia*	Coast Live Oak	13+11+18.5+12.5+11.5	35	26	3	3			
79	*Sequoia sempervirens*	Coast Redwood	8.5	22	9	4	3			
80	*Quercus agrifolia*	Coast Live Oak	8+8.5	20	25	3	3			
81	*Quercus agrifolia*	Coast Live Oak	8+16.5+12+14+15	50	25	3	3	Co-dominant trunks		
82	*Quercus agrifolia*	Coast Live Oak	16	30	27	4	3			
83	*Quercus agrifolia*	Coast Live Oak	22+12+22.5	50	27	3	3	Co-dominant trunks, included bark, anthracnose infection		
84	*Pseudotsuga menziesii*	Douglas-fir	7	20	6	3	3			

TREE INVENTORY
Sebastopol A Project
Sebastopol, CA

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
85	*Quercus agrifolia*	Coast Live Oak	15.5+14.5+15	40	25	3	3			
86	*Sequoia sempervirens*	Coast Redwood	15	35	12	4	3			
87	*Sequoia sempervirens*	Coast Redwood	11	30	10	4	3			
88	*Sequoia sempervirens*	Coast Redwood	13	35	12	4	3			
89	*Quercus agrifolia*	Coast Live Oak	7.5+10+6+6	25	16	3	3			
90	*Quercus agrifolia*	Coast Live Oak	±8	18	12	3	3			
91	*Quercus agrifolia*	Coast Live Oak	10.5+18	20	19	4	3			
92	*Quercus agrifolia*	Coast Live Oak	15+10+5+11	25	18	3	3			
93	*Pseudotsuga menziesii*	Douglas-fir	11.5	30	11	4	3			
94	*Pseudotsuga menziesii*	Douglas-fir	10.5	30	11	3	3			
95	*Quercus agrifolia*	Coast Live Oak	14+18	25	14	4	3			
96	*Quercus agrifolia*	Coast Live Oak	7	18	10	4	3			
97	*Quercus agrifolia*	Coast Live Oak	12	28	20	3	3			
98	*Quercus agrifolia*	Coast Live Oak	18.5	30	22	4	3			

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
99	*Quercus agrifolia*	Coast Live Oak	14.5+11	30	18	3	3			
100	*Quercus agrifolia*	Coast Live Oak	6+8.5	20	18	4	3			
101	*Quercus agrifolia*	Coast Live Oak	11+11+6	30	18	4	3			
102	*Quercus agrifolia*	Coast Live Oak	10+13.5+12+9+ 13	28	24	4	3			
103	*Quercus agrifolia*	Coast Live Oak	8+multiple	18	16	4	3			
104	*Quercus agrifolia*	Coast Live Oak	6+6+5+4+5	18	12	4	3			
105	*Quercus agrifolia*	Coast Live Oak	9+10+multiple	25	18	4	3			
106	*Quercus agrifolia*	Coast Live Oak	8.5	20	16	4	3			
107	*Quercus agrifolia*	Coast Live Oak	14+12.5	30	16	4	3			
108	*Quercus agrifolia*	Coast Live Oak	30	30	20	4	3			
109	*Quercus agrifolia*	Coast Live Oak	18+29	30	25	3	3	Co-dominant trunks, included bark, anthracnose infection		
110	*Pseudotsuga menziesii*	Douglas-fir	8	20	6	4	3			
111	*Gleditsia triacanthos*	Honey Locust	14	38	22	3	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
112	*Pinus sp.*	Pine	18	60	18	2	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
113	*Pinus sp.*	Pine	16	60	18	3	2	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
114	*Cedrus deodara*	Deodar Cedar	22	50	22	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
115	*Cedrus deodara*	Deodar Cedar	26	60	26	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
116	*Calocedrus decurrens*	Incense Cedar	9	18	7	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
117	*Salix matsudana "Tortuosa"*	Curly willow	14+ mulitiple	30	20	2	2	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
118	*Gleditsia triacanthos*	Honey Locust	8	18	18	3	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
119	*Pinus radiata*	Monterey pine	30+ multiple	80	35	4	2	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
120	*Ulmus americana*	American Elm	20	25	14	3	2	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
121	*Sequoia sempervirens*	Coast Redwood	32	50	17	4	2	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
122	*Sequoia sempervirens*	Coast Redwood	9	30	10	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
123	*Cedrus deodara*	Deodar Cedar	9	30	12	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
124	*Sequoia sempervirens*	Coast Redwood	33	60	18	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
125	*Sequoia sempervirens*	Coast Redwood	36	60	18	4	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
126	*Cedrus deodara*	Deodar cedar	14	45	15	3	3	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		

Tree #	Species	Common Name	Trunk (dbh ± inches)	Height (± feet)	Radius (± feet)	Health (1 - 5)	`	Special Notes	Expected Impact	Recommendations
127	*Alnus rhombifolia*	Alder	10	18	8	2	2	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
128	*Alnus rhombifolia*	Alder	7	18	5	2	1	Off site and overhanging, not tagged; trunk and root collar not visible; trunk diameter estimated		
129	*Sequoia sempervirens*	Coast Redwood	13	25	10	4	3			
130	*Pseudotsuga menziesii*	Douglas-fir	6	16	10	3	3			
131	*Pseudotsuga menziesii*	Douglas-fir	7	15	9	3	3			
132	*Pseudotsuga menziesii*	Douglas-fir	8	16	10	3	3			

KEY TO TREE INVENTORY CHART

KEY TO TREE INVENTORY CHART

Tree Number

Each tree has been identified in the field with an aluminum tag and reference number. Tags are attached to the trunk at approximately eye level. The *Tree Location Plan* illustrates the location of each numbered tree.

Species

Each tree has been identified by genus, species and common name. Many species have more than one common name.

Trunk

Each trunk has been measured or estimated, in inches, to document its diameter, at 4.5 feet above adjacent grade. Trunk diameter is a good indicator of age, and is commonly used to determine mitigation replacement requirements.

Height

Height is estimated in feet, using visual assessment.

Radius

Radius is estimated in feet, using visual assessment. Since many canopies are asymmetrical, it is not uncommon for a radius estimate to be an average of the canopy size.

Health

The following descriptions are used to rate the health of a tree. Trees with a rating of 4 or 5 are very good candidates for preservation and will tolerate more construction impacts than trees in poorer condition. Trees with a rating of 3 may or may not be good candidates for preservation, depending on the species and expected construction impacts. Trees with a rating of 1 or 2 are generally poor candidates for preservation.

(5) Excellent - health and vigor are exceptional, no pest, disease, or distress symptoms.

(4) Good - health and vigor are average, no significant or specific distress symptoms, no significant pest or disease.

(3) Fair - health and vigor are somewhat compromised, distress is visible, pest or disease may be present and affecting health, problems are generally correctable.

(2) Marginal - health and vigor are significantly compromised, distress is highly visible and present to the degree that survivability is in question.

(1) Poor - decline has progressed beyond the point of being able to return to a healthy condition again. Long-term survival is not expected. This designation includes dead trees.

Structure

The following descriptions are used to rate the structural integrity of a tree. Trees with a rating of 3 or 4 are generally stable, sound trees which do not require significant pruning, although cleaning, thinning, or raising the canopy might be desirable. Trees with a rating of 2 are generally poor candidates for preservation unless they are preserved well away from improvements or active use areas. Significant time and effort would be required to reconstruct the canopy and improve structural integrity. Trees with a rating of 1 are hazardous and should be removed.

(4) Good structure - minor structural problems may be present which do not require corrective action.

(3) Moderate structure - normal, typical structural issues which can be corrected with pruning.

(2) Marginal structure - serious structural problems are present which may or may not be correctable with pruning, cabling, bracing, etc.

(1) Poor structure - hazardous structural condition which cannot be effectively corrected with pruning or other measures, may require removal depending on location and the presence of targets.

TREE LOCATION PLAN

Protected trees with white numbers
Non protected trees with grey numbers

Sebastopol A Tree Location Map

Horticultural Associates

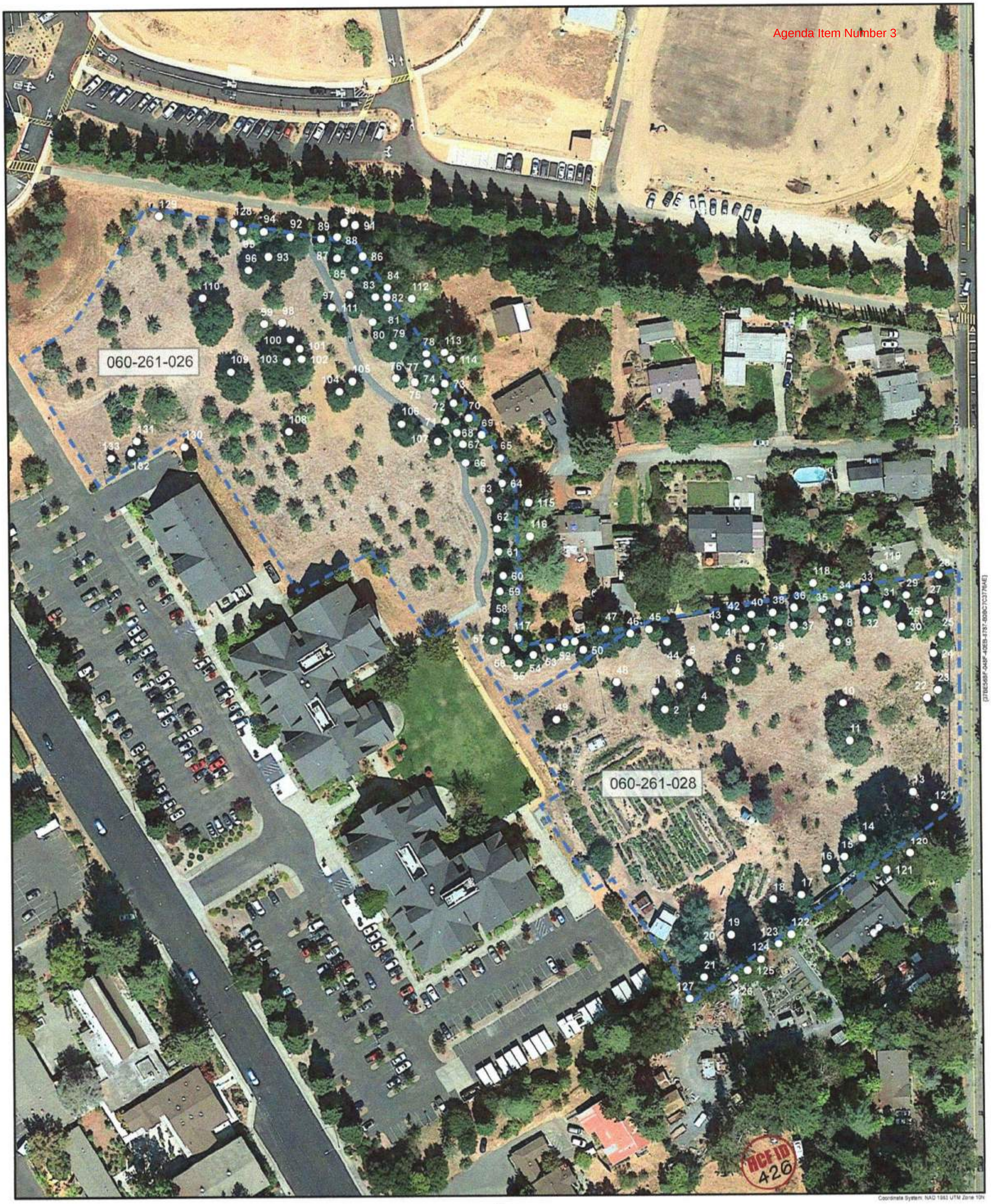
Date: 4/11/2019 Scale: 1:1,500 1 inch = 125 feet

125 0 125 Feet

Legend
- Tree Locations
- Tree < 10 in dia.
- Parcels

TREE LOCATION PLAN

Illustrates all trees greater than 6 inches in trunk diameter



Sebastopol A Tree Location Map

Horticultural Associates

Date: 4/8/2019 Scale: 1:1,500 1 inch = 125 feet

125 0 125 Feet

Legend

Tree Locations Parcels

HORTICULTURAL Associates
Consultants in Horticulture and Arboriculture
P.O Box 1261, Glen Ellen, CA 95442

January 17, 2023

Samantha Hauser
City Ventures
444 Speer Street
San Francisco, CA 94105

Re: North Gravenstein Highway, Sebastopol A Subdivision; additional tree removal documentation

Samantha,

After reviewing the latest set of plans for the above referenced project I found one additional protected tree that will require removal due to the required location of the new driveway apron along Gravenstein Highway, and this tree data is documented below:

Tree # 134
Sequoia sempervirens- Coast Redwood
Trunk Diameter 30", Dripline Radius 15', Height 50'

Health- Good (4)

Structure- Good (4)

Development Impact- Significant (3)

Recommendation- Removal required, significant development impacts (2)

I have included plans that show the location of this tree. Please contact me if you have questions or need additional information.

Regards,

John C. Meserve
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor/TRAQ
ASCA Qualified Tree and Plant Appraiser/TPAQ

INTERNATIONAL SOCIETY OF ARBORICULTURE
JOHN C. MESERVE
WE-0478A
Signature
CERTIFIED ARBORIST

~ Voice 707-935-3911 Fax 707-935-7103 ~

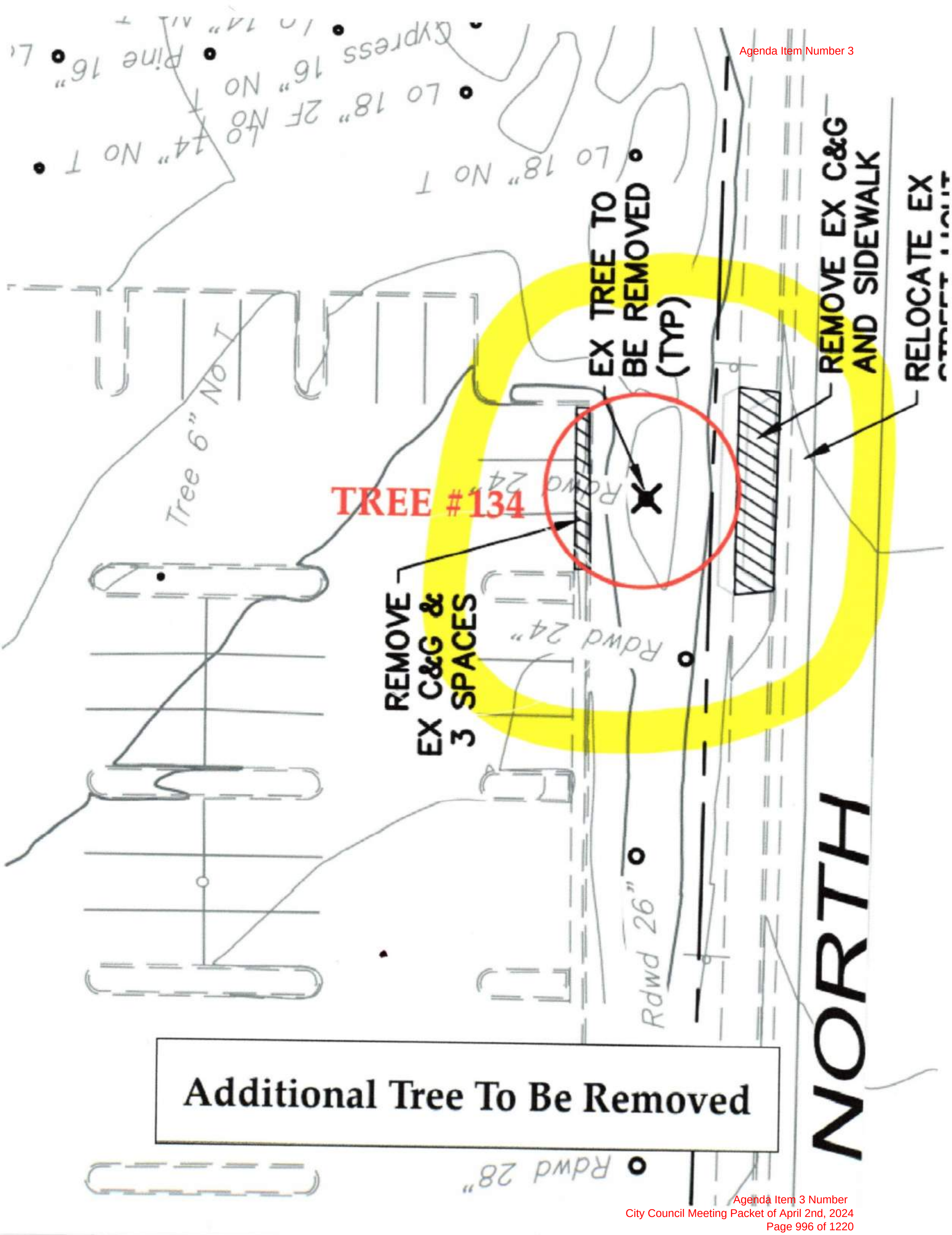
TREE LOCATION PLANS

Sebastopol A Tree Location Map

Horticultural Associates

Date: 4/11/2019 Scale: 1:1,800 1 inch = 125 feet

Location of additional tree that requires removal



Additional Tree To Be Removed

HORTICULTURAL Associates
Consultants in Horticulture and Arboriculture
P.O Box 1261, Glen Ellen, CA 95442

January 23, 2024

Samantha Hauser
Executive Vice President of Development
City Ventures
444 Speer Street, Suite 200
San Francisco, CA 94105

Re: Canopy project in Sebastopol; summary of existing tree impacts

Samantha,

At the request of Sebastopol City Planner John Jay I am providing this letter to summarize the impacts expected to trees by your proposed development. This summary is based on the Tree Inventory Chart we prepared in July of 2019 and I understand that no changes to the development plans have occurred since then that would affect trees. The following background and summary information is provided for your review:

A total of 133 trees were originally documented and evaluated, and one single Coast Redwood at the project entrance on Highway 116 was added later as an addendum after completion of the original report.

We inventoried protected trees that were 10 inches or greater in trunk diameter. We also inventoried trees 6 to 9 inches in diameter to be thorough, even though they are not protected by the Tree Ordinance.

There were a number of large Acacia at the site, and this species is not included in the inventory because it is listed on the Sebastopol 'escaped exotic' list and does not require preservation.

This site is a remnant apple orchard originating in the early 1900's. Apples are not a protected species and most are over-mature, decayed, declining, or dying back. No Apples were included in the Inventory.

~ Voice 707-935-3911 Fax 707-935-7103 ~

The following is a summary of the impacts expected:

(63) Protected trees that can be preserved

(29) Protected trees that must be removed

(28) Non protected trees that can be preserved

(14) Non protected trees that must be removed

(134) Total trees in the Inventory

Or:

(91) Protected and non-protected trees can be preserved

(43) Protected and non-protected trees that must be removed

(134) Total trees in the Inventory

Please feel free to contact me if you have questions regarding this summary, or if further evaluation is necessary.

Regards,

John C. Meserve
ISA Certified Arborist, WE #0478A
ISA Qualified Tree Risk Assessor/TRAQ
ASCA Qualified Tree and Plant Appraiser/TPAQ

HORTICULTURAL Associates

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January 23, 2024

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Regards,

John C. Meserve
ISA Certified Arborist, WE #0478A
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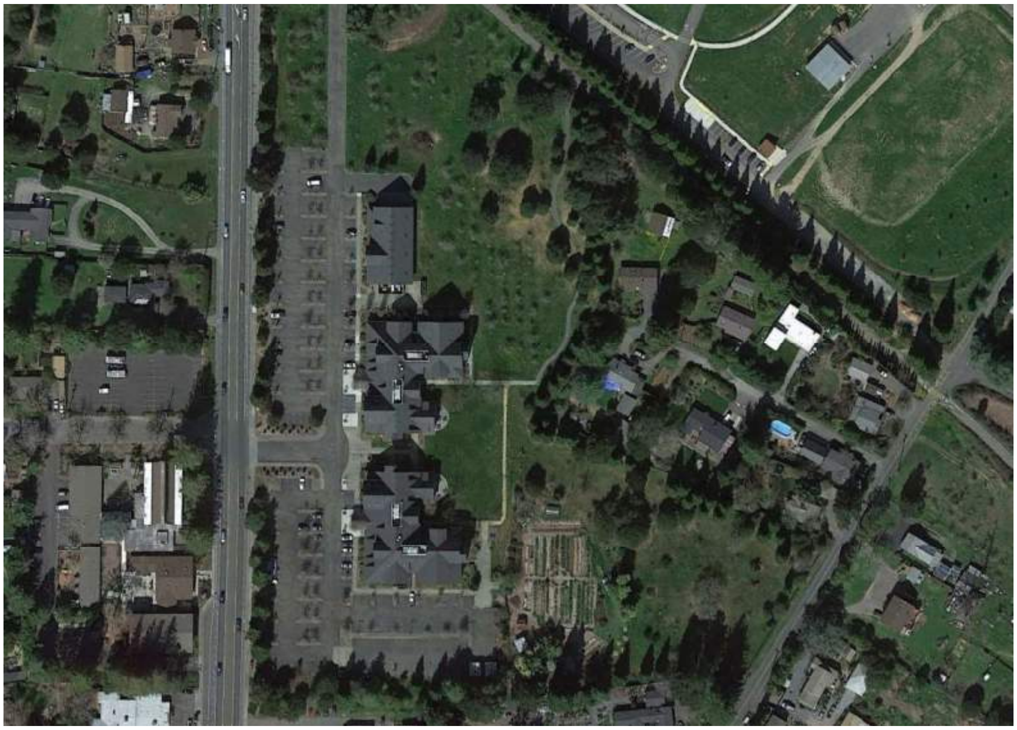
ASCA Qualified Tree and Plant Appraiser/TPAQ

INTERNATIONAL SOCIETY OF ARBORICULTURE
JOHN C. MESERVE
WE-0478A
Signature
CERTIFIED ARBORIST

Appendix G

Transportation Impact Study

Transportation Impact Study for The Canopy Project



Prepared for the City of Sebastopol

Submitted by
W-Trans

September 29, 2023

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Table of Contents

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Introduction

This report presents an analysis of the potential transportation, traffic, and mobility impacts that would be associated with a proposed residential development to be located at 1009-1011 Gravenstein Highway North in the City of Sebastopol. The traffic study was completed in accordance with the criteria established by the City of Sebastopol and is consistent with standard traffic engineering techniques.

Prelude

The purpose of a traffic impact study is to provide City staff and policy makers with data that they can use to make an informed decision regarding the potential transportation impacts of the proposed project, and any associated improvements that would be required to mitigate these impacts to an acceptable level under the California Environmental Quality Act (CEQA), the City's General Plan, or other policies. This report provides an analysis of those items that are identified as areas of environmental concern under the CEQA. Impacts associated with access for pedestrians, bicyclists, and to transit; the vehicle miles traveled (VMT) generated by the project; and safety concerns are addressed in the context of the CEQA criteria. While no longer a part of the CEQA review process, vehicular traffic service levels at key intersections were evaluated for consistency with General Plan policies by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on anticipated travel patterns specific to the proposed project, then analyzing the effect the new traffic would be expected to have on the study intersections and need for improvements to maintain acceptable operation.

The report is organized to provide background data that supports the various aspects of the analysis, followed by the assessment of CEQA issues and then evaluation of policy-related issues.

Project Profile

Project Description

The proposed residential project site is located on a vacant 6.1-acre parcel in northwest Sebastopol. It is adjacent to the O'Reilly Media Center to the west, which fronts on SR 116 (Gravenstein Highway North). Access would be provided via the intersection of SR 116/Mill Station Road as well as via the southernmost drive aisle of the existing office park parking lot to the south. The project would include 80 three-story townhome-style condominiums, with the potential for 16 ADA-accessible accessory dwelling units (ADUs). For the purposes of CEQA, full buildout of the site with 96 units was assumed. The proposed project site plan is shown in Figure 1.

Source: Weinstein Architects + Urban Designers LLC 3/13 seb080.ai 9/23

Transportation Impact Study for The Canopy Project

Figure 1– Site Plan

W-Trans

Transportation Setting

Study Area and Periods

The study area varies depending on the topic. For pedestrian trips it consists of all streets within a half-mile of the project site that would lie along primary routes of pedestrian travel, or those leading to nearby generators or attractors. For bicycle trips it consists of all streets within one mile of the project site that would lie along primary routes of bicycle travel. For the safety and traffic operational analyses, it consists of the project frontage and the following intersections:

1. SR 116 (Gravenstein Highway North)/Occidental Road
2. SR 116 (Gravenstein Highway North)/Mill Station Road
3. SR 116 (Gravenstein Highway North)/Hurlbut Avenue
4. SR 116 (Gravenstein Highway North-Healdsburg Avenue)/Covert Lane
5. SR 116 (Healdsburg Avenue)/Murphy Avenue
6. SR 116 (Healdsburg Avenue-North Main St)/North Main Street

Operating conditions during the a.m. and p.m. peak periods were evaluated to capture the highest potential impacts for the proposed project as well as the highest volumes on the local transportation network. The morning peak hour occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute, while an extended p.m. peak hour between 2:00 and 6:00 p.m. was analyzed to capture afternoon traffic from the adjacent Sebastopol Charter School as well as traffic typically reflecting the highest level of congestion during the homeward bound commute.

Study Intersections

SR 116 (Gravenstein Highway North)/Occidental Road is a four-legged signalized intersection located outside of the Sebastopol City limits. Crosswalks with pedestrian phasing are present on all but the south leg. Protected left-turn phasing is present on the northbound and southbound approaches and the eastbound and westbound approaches are split-phased or operate concurrently.

SR 116 (Gravenstein Highway North)/Mill Station Road is a four-legged signalized intersection with marked crosswalks and pedestrian phasing on all but the south leg. Protected left-turn phasing is present on the northbound and southbound approaches and the eastbound and westbound approaches are split-phased.

SR 116 (Gravenstein Highway North)/Hurlbut Avenue is a signalized four-legged intersection with marked zebra crosswalks on all four legs. Protected left-turn phasing is present on the northern and southern approaches and pedestrian phasing is present on all four legs. Class II bike lanes are available on the north and south legs of the intersection.

SR 116 (Gravenstein Highway North-Healdsburg Avenue)/Covert Lane is a tee intersection with stop controls on the Covert Lane approach. Covert Lane runs east-west, but curves to the north as it approaches SR 116. East of Covert Lane, SR 116 runs east-west, but curves to the north to the west of Covert Lane. In this study, SR 116 is considered to be the north and south legs and Covert Lane is the west leg. Class II bike lanes exist on both sides of the north leg of SR 116 and exist on the southwest side of SR 116 on the south leg. There are no marked crosswalks on any legs of the intersection.

SR 116 (Healdsburg Avenue)/Murphy Avenue is a three-way intersection with the stop control on the northbound Murphy Avenue approach. Marked crosswalks exist on the west and south legs of the intersection. Class II bike lanes exist on the east and west legs of the intersection, while there are sharrow markings on the south leg. Yield markings are on the east and west legs approaching the intersection and Rectangular Rapid Flashing Beacons (RRFB) are present on the west leg.

SR 116 (Healdsburg Avenue-North Main Street)/North Main Street is a signalized tee intersection with zebra crosswalks and pedestrian phasing on the north and east legs. Protected left-turn phasing exists on the eastern approach of the intersection. North Main Street curves to the west as it approaches Healdsburg Avenue and continues north. Class II bike lanes are present on the north side of the east leg, both sides of the west leg, and Class II bike lanes are present on both sides of the north leg.

The locations of the study intersections and the existing lane configurations and controls are shown in Figure 2.

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is January 1, 2018, through December 31, 2022.

As presented in Table 1, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in *2022 Collision Data on California State Highways*, California Department of Transportation (Caltrans). These average rates statewide are for intersections in the same environment (urban, suburban, rural), with the same number of approaches, and the same controls. Four of the six study intersections had calculated collision rates at or below the statewide average collision rate for similar interactions. The intersections of SR 116/ Occidental Rodd and SR 116/Covert Lane were determined to have collision rates above the statewide average, so these intersections were further reviewed. The collision rate calculations are provided in Appendix A.

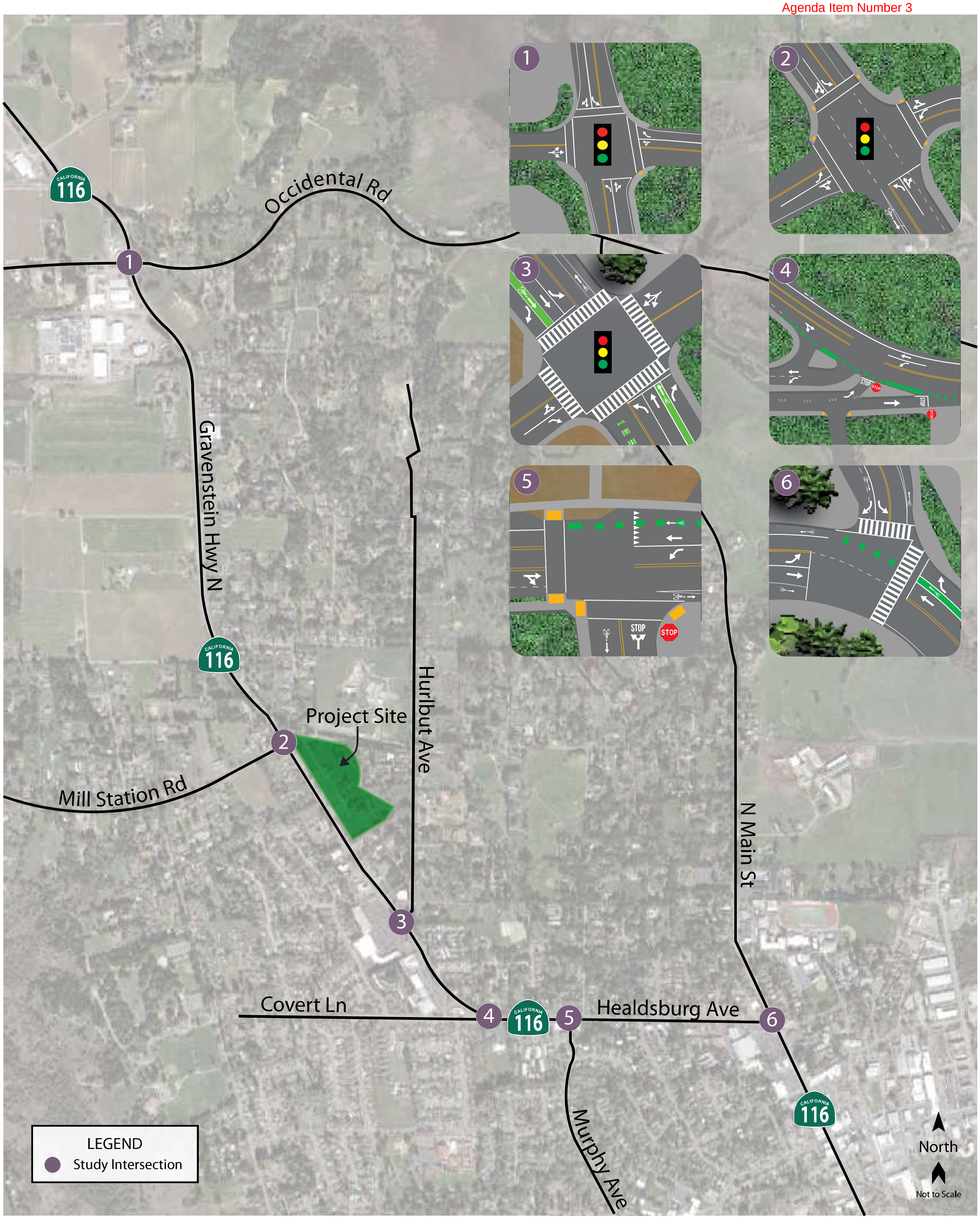
Table 1 – Collision Rates for the Study Intersections

Study Intersection	Number of Collisions (2018-2022)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. SR 116/Occidental Rd	12	**0.29**	0.20
2. SR 116/Mill Station Rd	4	0.14	0.33
3. SR 116/Hurlbut Ave	5	0.18	0.33
4. SR 116/Covert Ln	7	**0.22**	0.13
5. SR 116/Murphy Ave	4	0.13	0.13
6. SR 116 (Healdsburg Ave-N Main St)/N Main St	6	0.12	0.28

Note: c/mve = collisions per million vehicles entering; **Bold** text = higher than the statewide average

Of the 12 collisions that occurred at the intersection of SR 116/Occidental Road, eight were rear ends and four were sideswipes. Unsafe speed was the major factor in six of these collisions, improper passing resulted in three collisions, following too closely, unsafe starting and backing, and driving under the influence were stated as the primary causes for one collision each. While the collision rate is marginally higher than the statewide average, the injury rate is much lower: 16.7 percent versus the statewide average of 47.5 percent. No remedial action is therefore recommended.

The intersection of SR 116/Covert Lane had a total of seven collisions reported with four broadsides, one rear-end, one hit object, and one unspecified. Right-of-way violations were the primary cause of four of these collisions and unsafe speeds, driving on the wrong side of road, and driving under the influence each contributed to one collision. While this intersection has an above average collision rate, no patterns of correctable behavior could be determined and therefore no remedial action is recommended. However, it should be noted that this intersection has been identified for the future installation of a roundabout or traffic signal. The City will be coordinating with Caltrans for future planning and identification of funds to complete this project.



seb080.ai 9/23

Transportation Impact Study for The Canopy Project

Figure 2 – Study Area and Existing Lane Configurations

W-Trans

Circulation System

This section addresses the first transportation bullet point on the CEQA checklist, which relates to the potential for a project to conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

Pedestrian Facilities

Existing and Planned Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. Existing pedestrian facilities along the proposed project site frontage as well as within a one-quarter mile distance of the project site were reviewed.

A generally connected pedestrian network currently exists along SR 116 near the project site. However, there is no sidewalk on the west side of SR 116 north of its intersection with Danmar Drive. Sidewalks are present on the east side of SR 116 south of its intersection with Mill Station Road, and the West County-Joe Rodota Trail follows the east side of SR 116 north of Mill Station Road. As part of the project, pedestrian paths are planned to be built to connect the project site to the existing pedestrian network on the east side of SR 116. One pedestrian path would be located along the southeastern boundary of the project site and connect to the existing sidewalk on SR 116, and one would be located on the north side of the project site and connect to the West County-Joe Rodota Trail.

Caltrans has recently solicited bids for a project to install a new crosswalk with a HAWK (Pedestrian Hybrid Beacon) signal across the north leg of the intersection of SR 116/Danmar Drive. It is expected that this Caltrans-funded improvement will be installed before the end of 2023. It is recommended that a new pedestrian path be added through the center of the site to link the project and mixed commercial office park to the new HAWK crossing.

Pedestrian Safety

The collision history for the study area was reviewed to determine if any trends or patterns may indicate a potential safety issue for pedestrians. Collision records available from SWITRS reports were reviewed for the most current five-year period available, which was January 1, 2018, through December 31, 2022, at the time of the analysis. During the five-year study period there was one reported collision involving a pedestrian within a half mile of the project site. It occurred at the intersection of SR 116/Hurlbut Avenue, which is signalized and has high visibility crosswalks with pedestrian phasing. Based upon details contained in the SWITRS report, the collision was likely due to either driver or pedestrian inattention, and no remedial actions are recommended.

Finding – Pedestrian facilities serving the project site are adequate. The paths proposed and recommended as part of the project would provide adequate access to the existing pedestrian facilities. The project would not conflict with any existing plans or policies relative to pedestrian facilities.

Bicycle Facilities

Existing and Planned Bicycle Facilities

The *Highway Design Manual 7th Edition*, Caltrans, 2020, classifies bikeways into four categories:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route** – signage only for shared use with motor vehicles within the same travel lane on a street or highway.
- **Class IV Bikeway** – also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may

include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, striped buffers, or on-street parking.

In the project vicinity there are several existing Class I, II, and III bikeway facilities, including the Class I multi-use bicycle and pedestrian West County-Joe Rodota Trail, which runs between Occidental Road and North Main Street. There are existing bicycle lanes along SR 116 between the north city limit and North Main Street, along Covert Lane between Ragle Road and SR 116, and along High School Road-North Main Street between Occidental Road and SR 116. There are also several Class III bike routes in the project vicinity, most of which feature sharrow pavement markings.

According to the *Countywide Active Transportation Plan* (2014), bike lanes are planned along SR 116 between Occidental Road and the north city limit, on Bodega Avenue between Ragle Road and Dutton Avenue, and along Mill Station and Ragle roads between SR 116 and Covert Lane. Class I facilities are planned adjacent to Occidental Road and Bodega Avenue, and a Class III route is planned on Mill Station Road west of Ragle Road. Bicyclists ride in the roadway and/or on sidewalks along all other streets within the project study area. Table 2 summarizes the existing and planned bicycle facilities in the project vicinity, as contained in the *Countywide Active Transportation Plan*.

Table 2 – Bicycle Facility Summary

Status Facility	Class	Length (miles)	Begin Point	End Point
Existing				
West County/Rodota Trail	I	1.68	Occidental Rd	N Main St
Occidental Rd	II	1.83	Mill Station Rd	High School Rd
Covert Ln	II	0.50	Ragle Rd	SR 116
SR 116	II	0.52	North City Limit	Covert Ln
SR 116 (Healdsburg Ave)	II	0.64	Covert Ln	N Main St
High School Rd/N Main St	II	1.56	Occidental Rd	SR 116
Valentine Ave	III	0.60	Ragle Rd	Murphy Ave
Danmar Dr/Norlee St	III	0.48	SR 116	Covert Ln
Washington Ave	III	0.56	Willard Libby Park	Bodega Ave
Ragle Rd	III	0.52	Covert Ln	Bodega Ave
Pleasant Hill Ave	III	0.50	Covert Ln	Bodega Ave
Zimpher Dr	III	0.21	Covert Ln	Valentine Ave
Murphy Ave	III	0.38	SR 116	Valentine Ave
Planned				
West County/Rodota Trail	I	0.91	West County/Rodota Trail (west segment)	SR 116
Bodega Ave	I	0.29	Atascadero Creek	Ragle Rd
Mill Station Rd	II	0.26	Ragle Rd	SR 116
Bodega Ave	II	0.87	Ragle Rd	Dutton Ave-Jewell Ave
SR 116	II	0.95	Occidental Rd	North City Limit
Ragle Rd	II	0.41	Mill Station Rd	Covert Ln
Mill Station Rd	III	1.91	Occidental Rd	Ragle Rd

Source: *Countywide Active Transportation Plan*, Sonoma County Transportation Authority, 2014

The project as proposed would not result in the construction of any new bicycle facilities.

Bicyclist Safety

Collision records for the study area were reviewed to determine if there had been any bicyclist-involved crashes during the five-year study period between January 1, 2018, and December 31, 2022. There were two reported collisions involving bicyclists in the study area and both were likely caused by the cyclist violating the vehicle's right of way. No remedial action is therefore recommended.

Finding – Existing and planned bicycle facilities would provide adequate access for bicyclists traveling to and from the project. The project would not conflict with any policies or plans for bicycle facilities.

Transit Facilities

Existing Transit Facilities

Sonoma County Transit

Sonoma County Transit (SCT) provides fixed-route bus service in Sebastopol and surrounding areas. SCT Route 20, Route 24, and Route 26 all have stops within a half mile of the project site. Route 20 runs from the Coddingtown Mall in the City of Santa Rosa to Monte Rio in the Russian River Area. Route 24 runs from the Sebastopol Transit Hub to the intersection of SR 116/Mill Station Road, and Route 26 operates on school days only with one bus run in each direction per day, at 7:22 a.m. and 3:38 p.m. Existing transit routes and details regarding their operation are summarized in Table 3.

Table 3 – Transit Routes

Transit Agency Route	Distance to Stop (mi)[1]	Service			Connections
		Days of Operation	Time	Frequency	
Sonoma County Transit					
Route #20	< 0.1	Mon-Fri Sat-Sun	6:30 a.m. - 9:30 p.m. 6:30 a.m. - 9:30 p.m.	50 – 80 min 50 – 105 min	Monte Rio Coddingtown/Santa Rosa
Route #24	< 0.1	Mon-Fri Sat	7:45 a.m. - 6:30 p.m. 7:45 a.m. - 5:30 p.m.	45 – 55 min 45 – 55 min	Sebastopol SR 116/Mill Station Road
Route #26	< 0.1	School Days	7:22 a.m. 3:38 p.m.	1 run 1 run	Mirabel Park Sonoma State Univ.

Notes: [1] Defined as the shortest walking distance between the project site and the nearest bus stop
Source: sctransit.com/maps-schedules

Two bicycles can be carried on most SCT buses, and bike rack space is provided on a first-come, first-served basis. Additional bicycles are allowed on SCT buses at the discretion of the bus operator.

Dial-a-ride, also known as paratransit or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. SCT Paratransit is designed to serve the needs of individuals with disabilities within the City of Sebastopol and the greater Sonoma County area.

Impact on Transit Facilities

Given the size of the proposed project, there is unlikely to be substantial new demand for transit service generated by the development, though it is likely that some residents or visitors will occasionally choose to use transit. The existing pedestrian facilities are adequate to provide access to the project site from the transit stops and there are sufficient routes and headways to accommodate the nominal additional demand.

Finding – Existing public transit routes are adequate to accommodate the additional demand generated by the project, and existing bus stops accessible via continuous sidewalks. Transit facilities serving the project site are therefore considered to be adequate and the project would not conflict with any programs or policies regarding transit.

Significance Finding – The proposed project would have a less-than-significant impact relative to pedestrian, bicycle, and transit modes as it would be consistent with existing plans, policies, and programs for these modes.

Vehicle Miles Traveled (VMT)

The potential for the project to conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b) was evaluated based the project's anticipated Vehicle Miles Traveled (VMT). This is the second bullet point in the CEQA checklist.

Background

The Vehicle Miles Traveled (VMT) associated with a project is the primary basis for determining traffic impacts under CEQA. Because the City of Sebastopol has not yet adopted standards of significance for evaluating VMT, guidance provided by the California Governor's Office of Planning and Research (OPR) in the publication *Transportation Impacts (SB 743) CEQA Guidelines Update and Technical Advisory*, 2018, was used (referred to herein as the Technical Advisory). These criteria are consistent with those applied by Caltrans as outlined in the *Vehicle Miles Traveled-Focused Transportation Impact Study Guide*, California Department of Transportation, May 2020.

Significance Threshold

The OPR Technical Advisory provides VMT threshold guidance for several land use types. Residential uses are assessed using a home-based VMT per capita metric, with VMT significance thresholds set at a level of 15 percent below the citywide or regional average. The Technical Advisory indicates that it may be appropriate to apply a countywide, rather than regional, average if most people both live and work within the smaller geographic area. According to data contained in the *Sonoma County Travel Behavior Study*, SCTA, 2020, approximately 98 percent of Sebastopol's vehicle trips remain within Sonoma County. Use of a common model to produce both project-level and threshold values also allows for a clear "apples to apples" assessment. Accordingly, the applied significance threshold was based on the Sonoma County per-capita VMT average rather than the nine-County Bay Area regional average.

SCTA operates and maintains the regional travel demand model that produces baseline VMT estimates. The VMT thresholds and projections applied in this analysis reflect the SCTM19 model updated in December 2021, which remains the current version as of the August 2023 timeframe of this analysis. Based on output from the SCTA model, the existing average residential VMT per capita in the County of Sonoma is 16.60 miles. VMT significance thresholds are set at 15 percent below this level, or 14.11 miles. Accordingly, the project would have a potentially significant impact on VMT if its projected residential VMT per Capita exceeds 14.11 miles.

Project VMT Assessment

VMT per Capita

The SCTA model includes traffic analysis zones (TAZ) covering geographic areas throughout Sonoma County. The Canopy project site is located within TAZ 803, which has a baseline VMT per capita of 15.57 miles. Based on the model, for the project to achieve the applied threshold of 15 percent below the Countywide average, its projected VMT per capita would need to be reduced by at least 9.4 percent.

Consideration was given to whether adjustments to the baseline per-capita VMT estimates produced by the SCTA model are warranted to reflect project-specific details. The most common adjustments pertain to project density, provision of affordable housing, mix of uses, and off-site improvements to non-auto travel networks. The publication *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*, California Air Pollution Control Officers Association (CAPCOA), 2021, includes a methodology to determine the VMT reductions associated with increases in residential density. Per the CAPCOA methodology, a minimum density of 9.1 units per acre would need to be achieved before VMT reduction benefits could be realized. For the purposes of VMT analysis, only the 80 single-family attached dwelling units were evaluated and did not include the ADUs, which the project description identifies as optional. The residential density of the proposed project at 80 units is 13.1 dwelling units per acre, and applying the CAPCOA density methodology results in a VMT reduction of 9.69 percent, or 1.51 VMT. Applying this percentage reduction yields an adjusted VMT value of 14.06, which is below the threshold of 14.11, and therefore does not yield a significant project impact for VMT. Table 4 shows a summary of the VMT analysis.

Table 4 – Vehicle Miles Traveled Analysis Summary				
VMT Metric	**Baseline VMT Rate (Countywide Avg)**	**Significance Threshold (15% Below Countywide Avg)**	**Project VMT per Capita**	
			Project Site TAZ 803[1]	**Meets Threshold?**
Residential VMT per Capita (Countywide Baseline)	16.60	14.11	15.57	No
Applicable VMT Reduction	**Baseline Density (Countywide Avg)**	**Project Density**	**Calculated VMT Reduction**	**Adjusted VMT**
Higher Density Residential	9.1 du/acre	13.1 du/acre	9.69%	14.06

Notes: VMT Rate is measured in VMT per Capita, or the number of daily miles driven per resident; TAZ=Traffic Analysis Zone[1]; du/acre=dwelling units per acre

Significance Finding – Applying an allowable residential density reduction of 9.69 percent to the project VMT reduces the VMT impact of the project to a less-than-significant level. The project is expected to meet the applicable significance threshold for vehicle miles traveled.

Safety Issues

The potential for the project to impact safety was evaluated in terms of the adequacy of sight distance and need for turn lanes at the project access locations, as well as the adequacy of stacking space in left-turn lanes at the study intersections. This section addresses the third transportation bullet on the CEQA checklist which is whether or not the project would substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

Site Access

Primary access to the site would be provided at two locations: by an existing private drive that links the existing office development adjacent to the project to Mill Station Road and via the southernmost drive aisle of the office development's parking lot. A new curb cut and driveway would be created at the southernmost point of this drive aisle to provide more direct access to SR 116.

Sight Distance

Sight distances along SR 116 at the proposed new project driveway at the southernmost parking lot drive aisle were evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. Though Caltrans does not indicate a recommended sight distance for driveways in urban areas, for safety reasons the stopping sight distance was evaluated using the approach travel speed as the basis for determining the recommended sight distance. Additionally, the stopping sight distance needed for a following driver to stop if there is a vehicle waiting to turn into a side street or driveway was evaluated based on the stopping sight distance criterion and approach speed on the major street. Based on a posted speed of 35 mph for SR 116, the minimum stopping sight distance needed is 250 feet.

Field measurements indicate that sight distance at the driveways on SR 116 is over 300 feet in each direction and exceeds the stopping sight distance needed for vehicles traveling five mph above the posted speed limit of 35 mph. The sight distance at the private driveway location on Mill Station Road was field measured at 100 feet in each direction and does not meet the stopping sight distance requirement of 200 feet in each direction for five mph over the *prima facie* speed limit of 25 mph. As landscaping and signage can impede sight lines, any landscaping or signage placed within the vision triangle at the driveway should be less than three feet or more than seven feet above the pavement surface to maintain a clear line of sight.

Significance Finding – Sufficient sight distance is anticipated to be available at the new driveway created by the project at the southernmost drive aisle of the existing office park parking lot. However, existing sight distance at the driveway intersection at Mill Station Road would need to be increased to 200 feet in each direction in order to be deemed sufficient.

Emergency Access

The final transportation bullet on the CEQA checklist requires an evaluation as to whether the project would result in inadequate emergency access or not.

Adequacy of Site Access

As noted above, the project site would be accessed by an existing private road that connects to Mill Station Road to the northwest of the project site and by the access easement via the southernmost drive aisle of the parking lot of the adjacent development as well as a new driveway on SR 116 at the end of the project access drive aisle to provide direct access from the project to the street. The project would include a small private internal street network with a minimum travel width of 24 feet. This network and the parking stalls located therein appear to be in accordance with City design standards. Site access and circulation is therefore expected to function acceptably for emergency response vehicles.

Additionally, the nominal increase in traffic volumes resulting from the project can reasonably be expected to result in similarly nominal changes to traffic delays in the area. Since emergency responders can claim the right-of-way through use of their lights and sirens, the addition of project-generated traffic would be expected to have little to no impact on emergency response times.

Significance Finding – The project would have a less-than-significant impact on emergency response.

Capacity Analysis

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM) *Sixth Edition*, Transportation Research Board, 2018. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The Levels of Services for the intersections with side street stop controls, or those which are unsignalized and have one or two approaches stop controlled, were analyzed using the "Two-Way Stop-Controlled" intersection capacity method from the HCM. The methodology determines a level of service for each minor turning movement by estimating the average delay in seconds per vehicle. Results are presented for the stop-controlled approaches together with the weighted overall average delay for the intersection.

The study intersections that are currently or planned to be controlled by a traffic signal were evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether the signals are coordinated or not, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using signal timing obtained from Caltrans. Adjustments were made to signal timing under Future conditions to account for changes in demand patterns that would be typically addressed by periodic retiming.

Intersections that are proposed to be controlled by modern roundabouts were evaluated using the Federal Highway Administration (FHWA) Roundabout Method, also contained within the Unsignalized Methodology of the HCM. This methodology determines intersection operation using a gap acceptance method along with basic geometric and volume data to calculate entering and circulating flows. This information is then translated to average vehicle delays, with LOS break points at the same delays as used in the two-way stop-controlled methodology.

The ranges of delay associated with the various levels of service are indicated in Table 5.

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Table 5 – Intersection Level of Service Criteria			
LOS	**Two-Way Stop-Controlled**	**Roundabout**	**Signalized**
A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.	Delay of 0 to 10 seconds.	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
B	Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.	Delay of 10 to 15 seconds.	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
C	Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street.	Delay of 15 to 25 seconds.	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
D	Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.	Delay of 25 to 35 seconds.	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles must stop.
E	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.	Delay of 35 to 50 seconds.	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop, and drivers consider the delay excessive.
F	Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues.	Delay of more than 50 seconds.	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Reference: *Highway Capacity Manual*, Transportation Research Board, 2018

Traffic Operation Standards

Caltrans

All of the study intersections are under the jurisdiction of Caltrans, but Caltrans does not have a standard of significance relative to operation as this is no longer a CEQA issue. The *Vehicle Miles Traveled-Focused Transportation Impact Study Guide* (TISG), published in May 2020, replaced the *Guide for the Preparation of Traffic Impact Studies*, 2002. As indicated in the TISG, the Department is transitioning away from requesting LOS or other vehicle operation analyses of land use projects and will instead focus on Vehicle Miles Traveled (VMT). Adequacy of operation was therefore evaluated using the County's standards for the study intersection in Sonoma County (SR 116/Occidental Road) and using the City of Sebastopol's standards for the remaining five study intersections that are within City limits.

County of Sonoma

The Level of Service standard for intersections in Sonoma County is Level of Service D according to the *Sonoma County General Plan 2020* Policy CT-4.2. Based on the most recent criteria published by the County of Sonoma in May 2016 and updated in June 2019, the project would have an adverse effect on operation at SR 116/Occidental Road if it results in any of the following conditions:

- Project traffic would cause an intersection currently operating at an acceptable level of service (LOS D or better) to operate below the standard (LOS E or F).
- If the intersection currently operates or is projected to operate below the County standard (at LOS E or F), project traffic causes the average delay to increase by five seconds or more. The delay will be determined by comparing intersection operation with and without the project's traffic for both the existing and projected

future conditions. This criterion applies to all controlled intersections except for driveways and minor side streets that have less than 30 vehicle trips per hour per approach or exclusive left turn movement.

City of Sebastopol

The following criteria referenced in the *Draft Environmental Impact Report* (DEIR) *for the 2016 Sebastopol General Plan Update*, May 2016, De Novo Planning Group, were applied in order to determine if the project would have an adverse effect on operation at the five study intersections within the City limits:

- Utilize a Level of Service objective of LOS D at intersections to evaluate conditions and impacts, with primary focus on access and safety.
- At signalized intersections, levels of service shall be determined for the overall intersection.
- At unsignalized intersections, level of service shall be determined for both controlled movements and for the overall intersection. Controlled movements operating at LOS E or F would be considered acceptable if:
  - The intersection is projected to operate at LOS D or better overall; and
  - The projected traffic volume on the controlled movement is relatively low (30 vehicles or less per hour on approaches with single lanes, 30 vehicles or less per hour on lanes serving left turns and through movements).
- For intersections already operating worse than LOS objectives, development projects should not contribute substantially to further decline in LOS (causing the LOS to decline by a letter grade from LOS E to LOS F) or by more than a five percent increase in delay for intersections currently operating at an unacceptable LOS.

While not explicitly stated in the DEIR, it was also considered an adverse effect on operations if project traffic would cause an intersection operating acceptably at LOS D or better to operate unacceptably at LOS E or F. It is also noted Policy CIR 1-5 of the *Sebastopol General Plan*, November 2016, De Novo Planning Group, states that "when analyzing impacts to the circulation network created by new development or roadway improvements, consider the needs of all users, including those with disabilities, ensuring that pedestrians, bicyclists, and transit riders are considered preeminent to automobile drivers." In other words, there should be careful review to ensure that automobile improvements do not negatively affect the experiences of pedestrians, bicyclists, and transit riders.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the a.m. and p.m. peak periods. This condition does not include project-generated traffic volumes. Existing traffic counts were obtained for the study intersections in late May 2023 while area schools were in session.

Under existing conditions, four of the six study intersections are operating acceptably while the intersection of SR 116/Occidental Road operates unacceptably at LOS F during both peak hours and SR 116/North Main Street operates unacceptably at LOS E during the p.m. peak hour. It is noted that the signal at SR 116/North Main Street includes an exclusive pedestrian phase which cannot be directly modeled using the HCM methodology, and thus the pedestrian phase was modeled as a northbound vehicle phase. The average vehicle delay and LOS for each scenario at SR 116 (Healdsburg Avenue-North Main Street)/North Main Street is contained in an additional spreadsheet in Appendix B in which the delay experienced by pedestrians was removed from the calculations.

The existing traffic volumes are shown in Figure 3. A summary of the intersection Level of Service calculations is presented in Table 6, and copies of the calculations are provided in Appendix B.

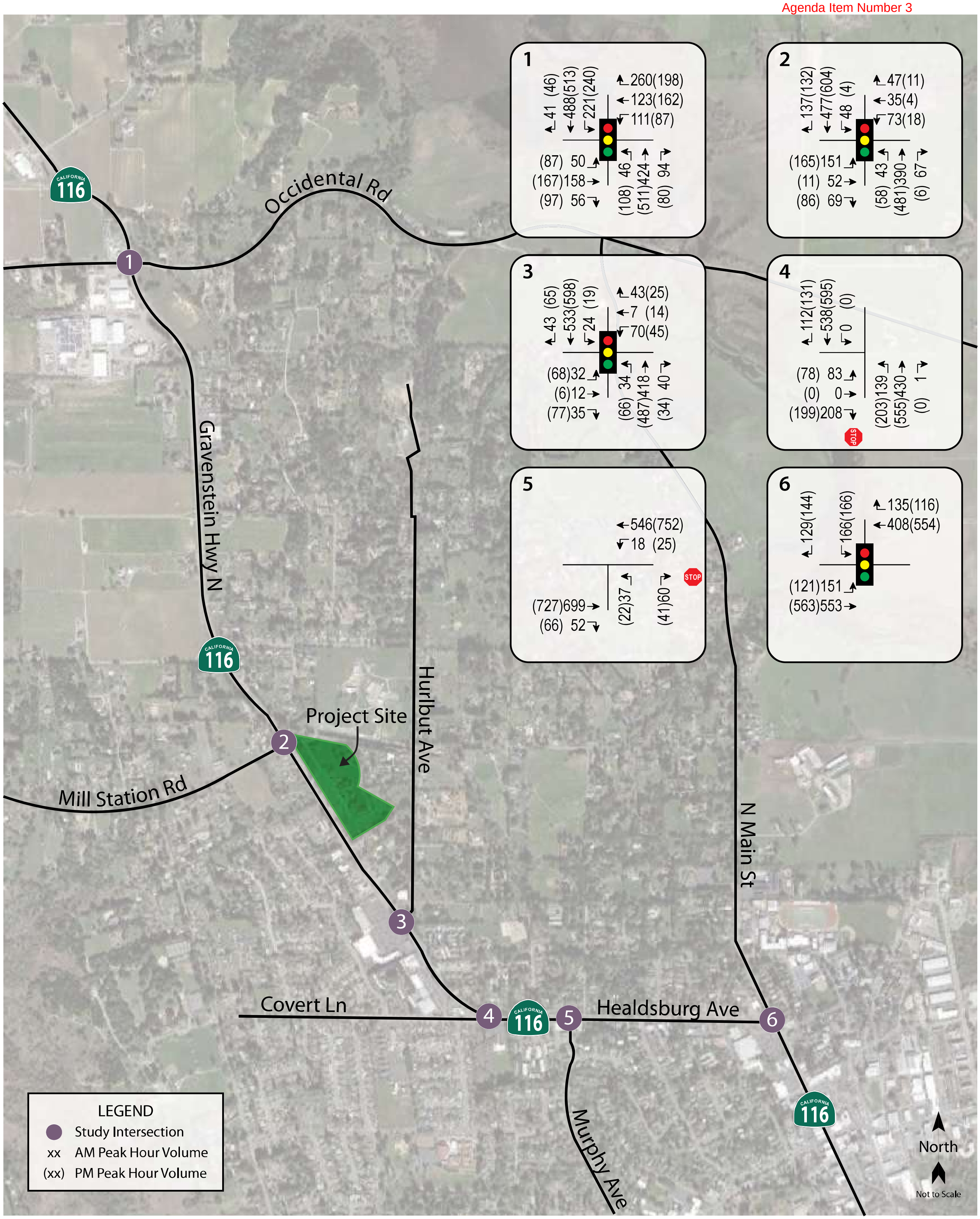

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Figure 3 – Existing Traffic Volumes

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Table 6 – Existing Peak Hour Intersection Levels of Service				
Study Intersection	**AM Peak**		**PM Peak**	
Approach	**Delay**	**LOS**	**Delay**	**LOS**
1. SR 116/Occidental Rd	**109**	**F**	**123**	**F**
Add EBL/WBL Lanes with protected Phasing, WBR OL	**57.7**	**E**	**59.7**	**E**
Add EBL/WBL Lanes with protected Phasing, Add EBR Lane and WBR Overlap	48.2	D	46.7	D
With Roundabout	26.8	D	33.1	D
2. SR 116/Mill Station Rd	38.0	D	28.2	C
3. SR 116/Hurlbut Ave	20.9	C	23.9	C
4. SR 116/Covert Ln	5.5	A	4.9	A
Eastbound (Covert Ln) Approach	*21.8*	*C*	*22.0*	*C*
5. SR 116/Murphy Ave	1.7	A	0.9	A
Northbound (Murphy Ave) Approach	*23.1*	*C*	*20.3*	*C*
6. SR 116/N Main St	46.7	D	**56.8**	**E**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation; Shaded cells = conditions with indicated modifications

The following capacity measures to decrease delay and improve operation of the intersection of SR 116/Occidental Road operating unacceptably were analyzed.

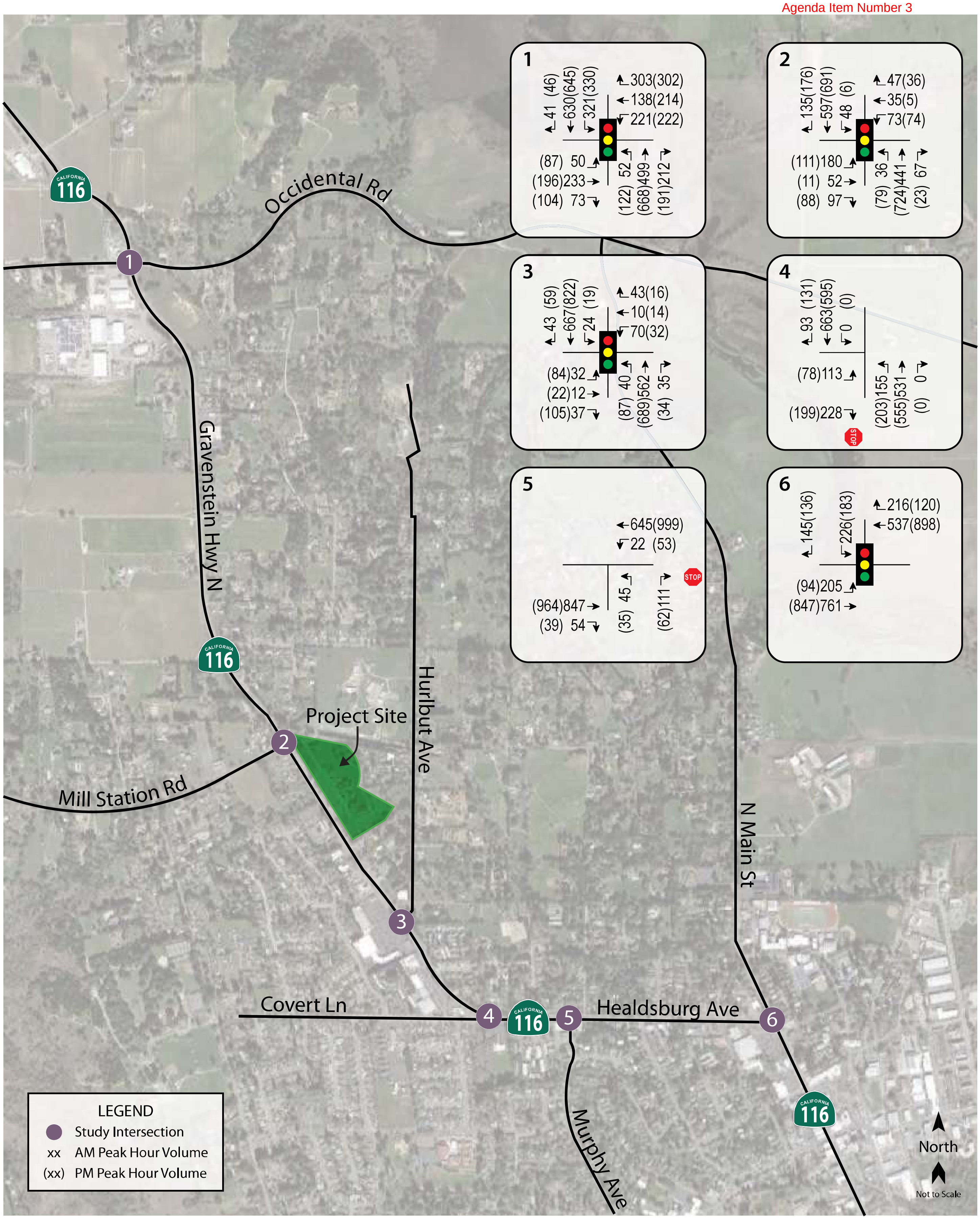
- Add 200-foot-long left-turn pockets on the eastbound and westbound approaches.
- Convert the existing split phasing to protected left-turn phasing on the eastbound and westbound approaches.
- Install a westbound right-turn overlap phase.

The intersection would continue operating unacceptably at LOS E with these modifications despite the reduction in delay. Adding a 200-foot-long eastbound right-turn lane to the above changes or installing a single-lane roundabout would both result in acceptable operation of LOS D.

Future Conditions

Future intersection turning movements for five of the six study intersections were obtained from the Circulation Element of the *Sebastopol General Plan*, while future turning movements at SR 116/Occidental Road were developed using the "Furness" method and segment volumes for the horizon year of 2040 from the SCTA traffic model. The Furness method is an iterative process that employs existing turn movement data, existing link volumes, and future link volumes to project likely future turning movement volumes at intersections.

Under anticipated Future volumes, four of the six intersections are expected to operate acceptably. The intersection of SR 116/Occidental Road is expected to operate unacceptably at LOS F during both peak hours and SR 116/North Main Street is expected to operate unacceptably at LOS E during the p.m. peak hour. Future volumes are shown in Figure 4 and operating conditions are summarized in Table 7, and copies of the calculations are provided in Appendix B.



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Transportation Impact Study for The Canopy Project

Figure 4 – Future Traffic Volumes

W-Trans

Table 7 – Future Peak Hour Intersection Levels of Service				
Study Intersection *Approach*	**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. SR 116/Occidental Rd	**235**	**F**	**225**	**F**
Add EBL/WBL Lanes, Protected LT Phasing, WBR Overlap	**158**	**F**	**130**	**F**
Add EBL/WBL Lanes, Protected LT Phasing, EBR Lane, and WBR OL	**134**	**F**	**109**	**F**
With Roundabout	**176**	**F**	**176**	**F**
2. SR 116/Mill Station Rd	36.0	D	33.9	D
3. SR 116/Hurlbut Ave	24.0	C	29.0	C
4. SR 116/Covert Ln	5.8	A	4.8	A
Eastbound (Covert Ln) Approach	*24.5*	*C*	*32.5*	D
With Roundabout	11.4	B	22.6	C
5. SR 116/Murphy Ave	2.8	A	1.8	A
Northbound (Murphy Ave) Approach	*29.8*	*D*	*34.1*	*D*
6. SR 116/N Main St	51.5	D	**62.4**	**E**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = deficient operation; Shaded cells = conditions with indicated modifications

Adding 200-foot-long left-turn pockets on the east and west legs, protected left-turn phasing on the eastbound and westbound approaches, and a westbound right-turn overlap phase to SR 116/Occidental Road or converting the intersection to a roundabout would be expected to decrease delay at the intersection under Future conditions; however, the intersection would continue operating unacceptably at LOS F during both peak hours as it also would under each improvement scenario.

In accordance with Action CIR 1d of the General Plan and *City of Sebastopol SR 116 Safety Study*, 2021, W-Trans, the intersection of SR 116/Covert Lane was modeled with a roundabout under Future conditions as well as with its current configuration. With a roundabout, SR 116/Covert Lane is expected to operate acceptably at LOS B or C. It is noted that a roundabout project is not currently a part of the City or Caltrans' Capital Improvement Program (CIP); however, the City will be pursuing a roundabout concept and potential funding sources at this location in cooperation with Caltrans later in the coming year.

Project Conditions

Trip Generation

The anticipated vehicle trip generation for the proposed project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 11th Edition, 2021. Since the site is currently undeveloped, no existing trips were analyzed. The trip generation potential of the project as planned was developed using the published standard rates for Single Family Attached Housing (Land Use #215) and Multifamily Housing (Low-Rise) (Land Use #220), as the description of these land uses most closely matches the proposed project.

The number of residential units analyzed is 96, which includes 80 condominiums and 16 potential ADUs. Based upon the application of these assumptions, the proposed project is expected to generate an average of 684 trips per day, including 44 a.m. peak hour trips and 54 trips during the p.m. peak hour on a typical weekday. These results are summarized in Table 8.

Table 8 – Trip Generation Summary												
Land Use	**Units**	**Daily**		**AM Peak Hour**				**PM Peak Hour**				
		Rate	**Trips**	**Rate**	**Trips**	**In**	**Out**	**Rate**	**Trips**	**In**	**Out**	
Single Family (Attached)	80 du	7.20	576	0.48	38	10	28	0.57	46	27	19	
Multifamily Housing	16 du	6.74	108	0.40	6	2	4	0.51	8	5	3	
Total			**684**		**44**	**12**	**32**		**54**	**32**	**22**	

Note: du = dwelling unit

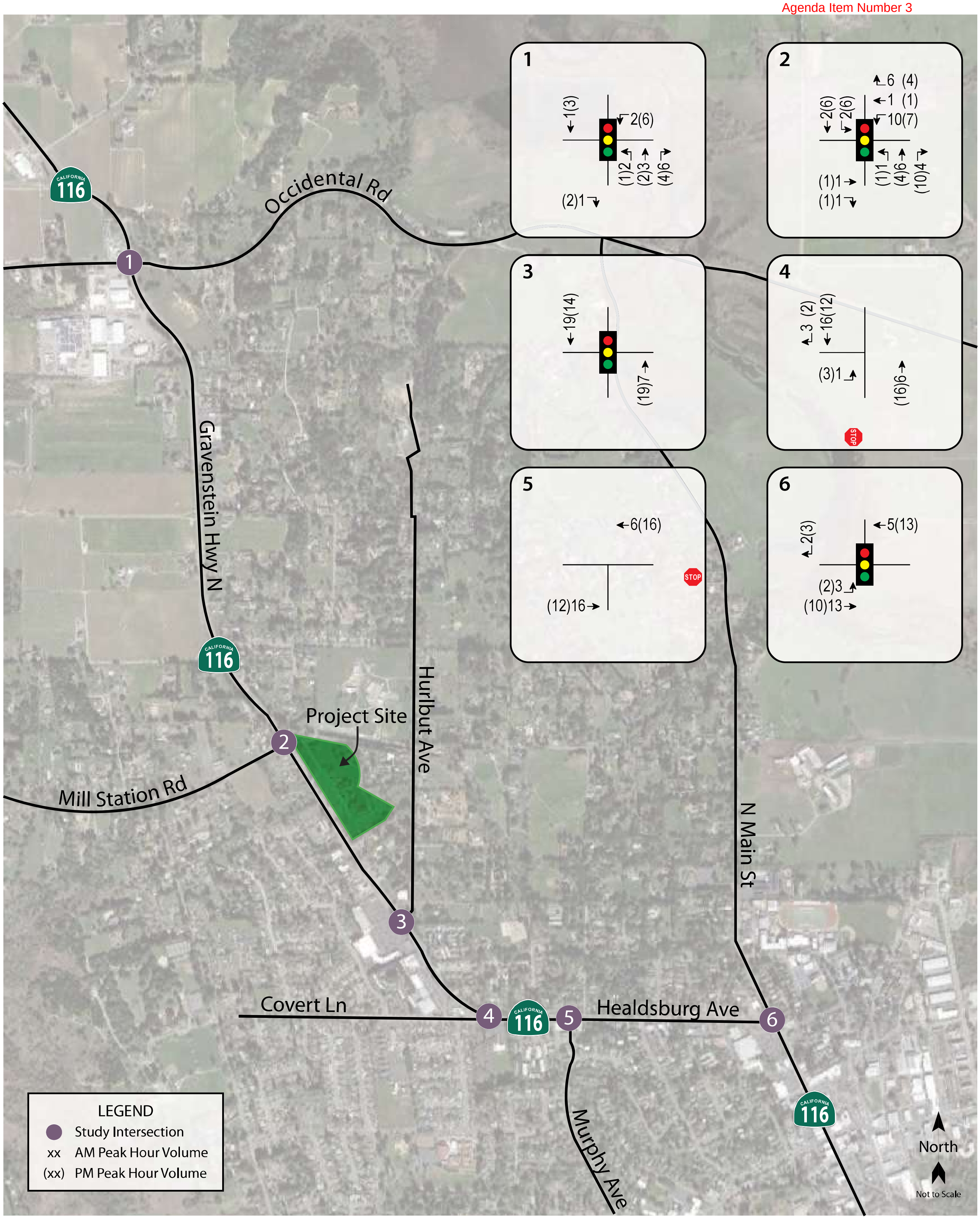
Trip Distribution

The distribution pattern used to allocate new project trips to the street network was determined by reviewing existing turning movements at the study intersections as well as employment patterns for residents of the City of Sebastopol, as indicated by the 2010 Census. Since traffic conditions are generally most critical during the weekday p.m. peak hour, these distribution assumptions are primarily based on the expected trip routes during that time. The distribution assumptions shown in Table 9 were used.

Table 9 – Trip Distribution Assumptions				
Route	**Percent**	**Daily Trips**	**AM Trips**	**PM Trips**
Occidental Rd (To/From the East)	20%	137	9	11
Occidental Rd (To/From the West)	5%	34	2	3
SR 116 (To/From the North)	10%	68	4	5
SR 116 (To/From the South)	40%	275	18	22
Mill Station Rd (To/From the West)	5%	34	2	3
Covert Ln (To/From the West)	10%	68	4	5
N. Main St (To/From the North)	10%	68	4	5
TOTAL	**100%**	**684**	**44**	**54**

Existing plus Project Conditions

Upon the addition of project-generated traffic to the existing volumes, four of six study intersections are expected to continue operating acceptably while the intersection of SR 116/Occidental Road would continue operating unacceptably at LOS F during both peaks and SR 116/North Main Street would continue operating unacceptably at LOS E during the p.m. peak hour. Project traffic volumes are shown in Figure 5 and Existing plus Project volumes are shown in Figure 6. The analysis results are summarized in Table 10, and copies of the calculations are provided in Appendix B.



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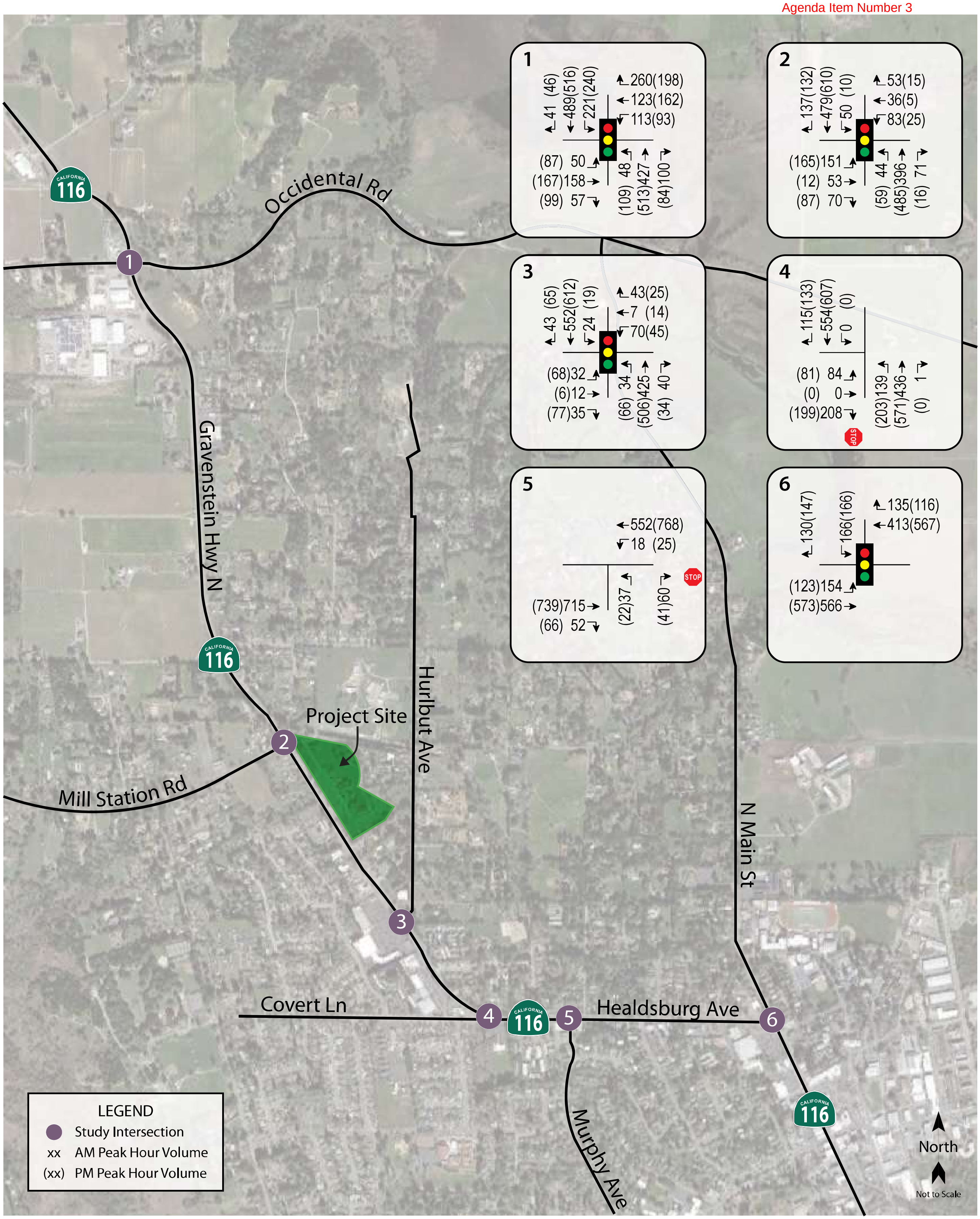
Transportation Impact Study for The Canopy Project

Figure 5 – Project Traffic Volumes

W-Trans



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Transportation Impact Study for The Canopy Project

Figure 6 – Existing plus Project Traffic Volumes

W-Trans

Table 10 – Existing and Existing plus Project Peak Hour Intersection Levels of Service								
Study Intersection	**Existing Conditions**				**Existing plus Project**			
Approach	**AM Peak**		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. SR 116/Occidental Rd	**109**	**F**	**123**	**F**	**113**	**F**	**127**	**F**
Add EBL/WBL Lanes, Protected LT Phasing, and WBR Overlap	**57.7**	**E**	**59.7**	**E**	**59.9**	**E**	**61.3**	**E**
Add EBL/WBL Lanes, Protected LT Phasing, EBR Lane and WBR Overlap	48.2	D	46.7	D	49.8	D	47.6	D
With Roundabout	26.8	D	33.1	D	27.8	D	34.5	D
2. SR 116/Mill Station Rd	38.0	D	28.2	C	38.7	D	31.6	C
3. SR 116/Hurlbut Ave	20.9	C	23.9	C	21.7	C	24.7	C
4. SR 116/Covert Ln	5.5	A	4.9	A	5.6	A	5.1	A
Eastbound (Covert Ln) Approach	*21.8*	*C*	*22.0*	*C*	*22.6*	*C*	*22.8*	*C*
5. SR 116/Murphy Ave	1.7	A	0.9	A	1.7	A	0.9	A
Northbound (Murphy Ave) Approach	*23.1*	*C*	*20.3*	*C*	*23.6*	*C*	*20.7*	*C*
6. SR 116/N Main St	46.7	D	**56.8**	**E**	47.8	D	**61.0**	**E**
With Signal Timing Optimization	-		-		-		54.5	D

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = deficient operation; Shaded cells = conditions with indicated modifications

Adding 200-foot-long left-turn lanes on the eastbound and westbound approaches, protected left-turn phasing, and a westbound right-turn overlap phase to SR 116/Occidental Road would reduce delay substantially, but the intersection would continue operating unacceptably at LOS E with or without project trips. Adding a 200-foot-long eastbound right-turn lane with the above modifications or installing a single-lane roundabout would result in acceptable operation under Existing plus Project volumes. The project would add less than five seconds of delay at SR 116/Occidental Road and would not cause a deterioration in the service level; therefore, the project would not cause an adverse effect on existing operations per the County's standards.

The project would result in a greater than a five percent increase in average delay at SR 116/North Main Street, which would operate unacceptably at LOS E during the p.m. peak hour without or with the project. As a result, this is considered an adverse project impact under the City's standards. Optimizing the signal's cycle length and splits to accommodate project trips would result in an improved LOS D. Therefore, it is recommended that the project applicant contribute to the City's Traffic Impact Fee (TIF) that could be used to adjust the signal's timing since the intersection is located near downtown with no right-of-way available for capacity enhancements.

Finding – Four of the six study intersections would be expected to operate acceptably with the addition of project traffic to existing volumes while the intersections of SR 116/Occidental Road and SR 116/North Main Street would operate unacceptably with or without the project. The project would result in a greater than five percent increase in delay at SR 116/North Main Street during the p.m. peak hour, resulting in an adverse effect per the City's standards.

Recommendation – The project applicant should contribute to the City of Sebastopol TIF that could be used to re-time the signal at SR 116/North Main Street to optimize operation.

Future plus Project Conditions

Upon the addition of project-generated traffic to the anticipated future volumes, four of the study intersections are expected to operate acceptably. SR 116/Covert Lane would operate acceptably with or without a roundabout installed. Future plus Project intersection operations are summarized in Table 11, and volumes are shown in Figure 7. Copies of the calculations are provided in Appendix B.

Table 11 – Future and Future plus Project Intersection Levels of Service

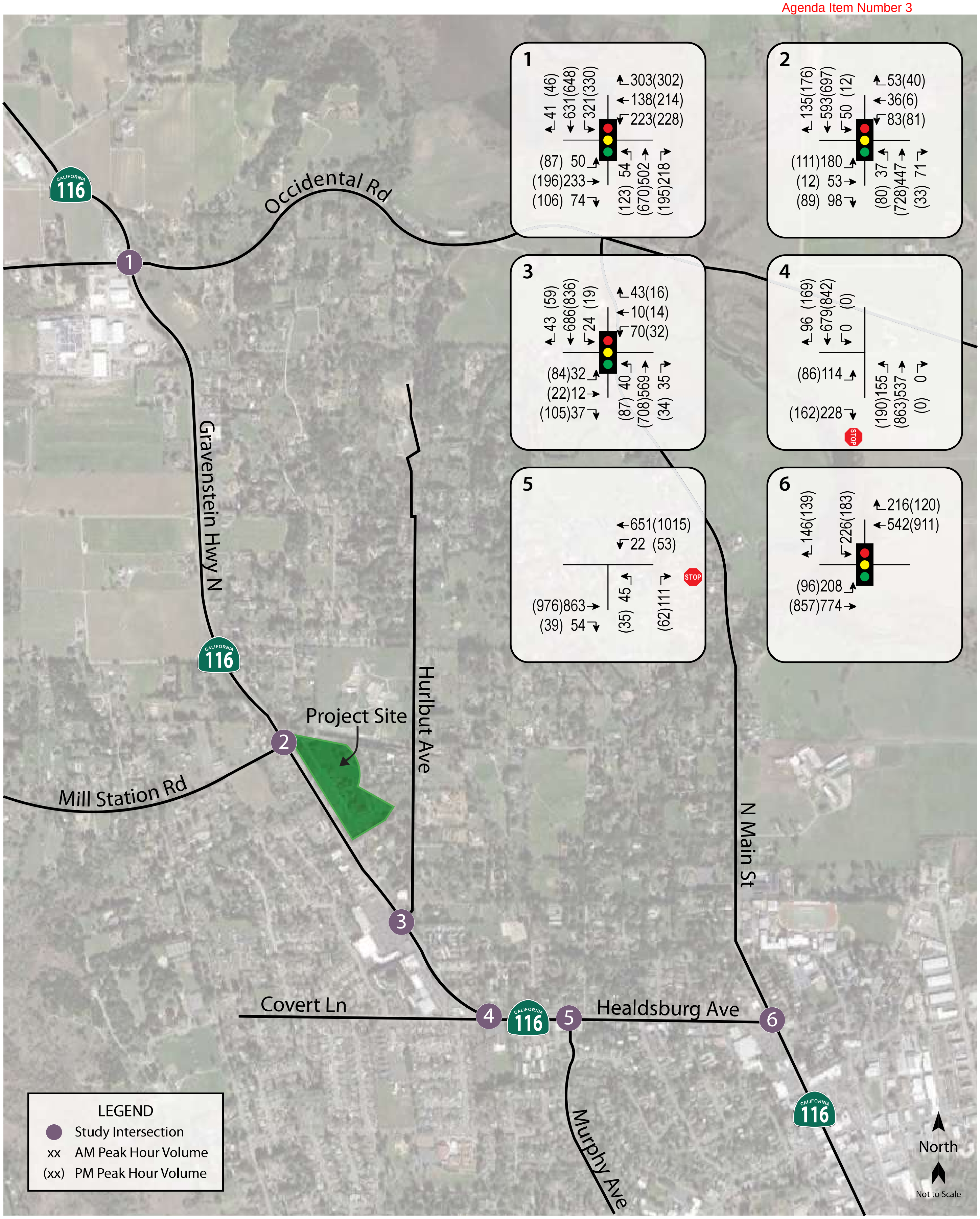
Study Intersection	Future Conditions				Future plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 116/Occidental Rd	**235**	**F**	**225**	**F**	**239**	**F**	**229**	**F**
Add EBL/WBL Lanes, Protected EBL/WBL Phasing, and WBR Overlap	**158**	**F**	**130**	**F**	**161**	**F**	**133**	**F**
Add EBL/WBL Lanes, Protected LT Phasing, EBR Lane and WBR Overlap	**134**	**F**	**109**	**F**	**137**	**F**	**111**	**F**
With Roundabout	**176**	**F**	**176**	**F**	**181**	**F**	**182**	**F**
2. SR 116/Mill Station Rd	36.0	D	33.9	D	36.8	D	35.1	D
3. SR 116/Hurlbut Ave	24.0	C	29.0	C	25.1	C	30.2	C
4. SR 116/Covert Ln	5.8	A	4.8	A	6.0	A	4.9	A
Eastbound (Covert Ln) Approach	*24.5*	*C*	*32.5*	D	*25.4*	*D*	*34.2*	*D*
With Roundabout	11.4	B	22.6	C	11.8	B	23.9	C
5. SR 116/Murphy Ave	2.8	A	1.8	A	2.9	A	1.8	A
Northbound (Murphy Ave) Approach	*29.8*	*D*	*34.1*	*D*	*30.8*	*D*	*35.1*	*E*
6. SR 116/N Main St	51.5	D	**62.4**	**E**	52.5	D	**64.9**	**E**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** = Unacceptable operation; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; Shaded cells = conditions with indicated modifications

The intersections of SR 116/Occidental Road and SR 116/North Main Street would continue operating unacceptably with the addition of project traffic; however, as the anticipated increases in overall delay would be less than five seconds for SR 116/Occidental Road and less than five percent for SR 116/North Main Street, the project's effects would be considered acceptable per the County's and City's standards, respectively.

The addition of left-turn lanes and protected left-turn phasing on the eastbound and westbound approaches to SR 116/Occidental Road as well as a westbound right-turn overlap phase would reduce delay while still resulting in LOS F. Installing a 200-foot-long eastbound right-turn lane along with the above changes would further reduce delay, while a single-lane roundabout at the intersection would be expected to have the least benefit in terms of reduced delay.

Finding – Four of the six study intersections would be expected to operate acceptably with the addition of project trips to future volumes while the intersections of SR 116/Occidental Road and SR 116/North Main Street would operate unacceptably under Future plus Project volumes or without project traffic added.



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Transportation Impact Study for The Canopy Project

Figure 7 – Future plus Project Traffic Volumes

W-Trans

Conclusions and Recommendations

Conclusions

- The proposed project is expected to generate an average of 684 trips per day, including 44 a.m. peak hour trips and 54 trips during the p.m. peak hour on a typical weekday.
- The existing and planned pedestrian, bicycle, and transit facilities provide adequate access to and from the project site and the project does not conflict with any policies, plans or programs for these modes.
- The project is expected to meet the applicable significance threshold for vehicle miles traveled.
- Sufficient sight distance is anticipated to be available at the new driveway created by the project. However, existing sight distance at the driveway intersection at Mill Station Road would need to be increased to 200 feet in each direction in order to be deemed sufficient.
- The proposed roadway network, including connectivity to existing streets, would provide adequate emergency circulation and access from a transportation perspective.
- The project would be subject to review and approval by the City's Fire Marshal; any requirements imposed by the Fire Marshal shall take precedence over the emergency access and circulation findings contained herein.
- Under existing conditions with and without the Project, four of the six study intersections are operating acceptably while the intersection of SR 116/Occidental Road operates unacceptably at LOS F during both peak hours and SR 116/North Main Street operates unacceptably at LOS E during the p.m. peak hour. The addition of project traffic would not result in an adverse impact at SR 116/Occidental Road, per the County's standards but would result in an adverse impact at SR 166/North Main Street per the City's standards.
- Four of the six study intersections would be expected to operate acceptably with the addition of project trips to future volumes while the intersections of SR 116/Occidental Road and SR 116/North Main Street would operate unacceptably under Future plus Project conditions. The addition of project traffic to future volumes would not result in an adverse impact at either intersection, per the County's and City's standards, respectively.
- The addition of left-turn lanes and protected left-turn phasing on the eastbound and westbound approaches at SR 116/Occidental Road, as well as a westbound right-turn overlap phase, would reduce delay while still resulting in LOS F operation. Installing a 200-foot-long eastbound right-turn lane along with the above changes would further reduce delay, while a single-lane roundabout at the intersection would be expected to cause the smallest reductions in delay.

Recommendations

- The project applicant should contribute to the City of Sebastopol TIF. Such monies could be used to re-time the signal at SR 116/North Main Street to minimize delay.

Study Participants and References

Study Participants

Principal in Charge	Steve Weinberger, PE, PTOE
Associate Planner	Mark Brown
Assistant Engineer	Nathan Sharafian, EIT, Valerie Haines, EIT
Graphics	Cameron Wong
Editing/Formatting	Jessica Bender
Quality Control	Dalene J. Whitlock, PE, PTOE

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Appendix A

Collision Rate Calculations

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Intersection Collision Rate Worksheet

The Canopy EIR

Intersection # 1: SR 116 (Gravenstein Highway North) & Occidental Road
Date of Count: Thursday, May 25, 2023

Number of Collisions: 12
Number of Injuries: 2
Number of Fatalities: 0
Average Daily Traffic (ADT): 23000
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Stop & Yield Controls
Area: Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{12 \quad x \quad 1,000,000}{23,000 \quad x \quad 365 \quad x \quad 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.29 c/mve**	**0.0%**	**16.7%**
Statewide Average*	**0.20 c/mve**	**1.1%**	**47.5%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Intersection # 2: SR 116 (Gravenstein Highway North) & Mill Station Road
Date of Count: Thursday, May 25, 2023

Number of Collisions: 4
Number of Injuries: 2
Number of Fatalities: 0
Average Daily Traffic (ADT): 15800
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{4 \quad x \quad 1,000,000}{15,800 \quad x \quad 365 \quad x \quad 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.14 c/mve**	**0.0%**	**50.0%**
Statewide Average*	**0.33 c/mve**	**0.6%**	**47.7%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Intersection Collision Rate Worksheet

The Canopy EIR

Intersection # 3: SR 116 (Gravenstein Highway North) & Hurlbut Avenue
Date of Count: Thursday, May 25, 2023

Number of Collisions: 5
Number of Injuries: 3
Number of Fatalities: 0
Average Daily Traffic (ADT): 15000
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{5 \quad x \quad 1{,}000{,}000}{15{,}000 \quad x \quad 365 \quad x \quad 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.18 c/mve**	**0.0%**	**60.0%**
Statewide Average*	**0.33 c/mve**	**0.6%**	**47.7%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Intersection # 4: SR 116 (Healdsburg Avenue) & Covert Lane
Date of Count: Thursday, May 25, 2023

Number of Collisions: 7
Number of Injuries: 5
Number of Fatalities: 0
Average Daily Traffic (ADT): 17600
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls
Area: Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{7 \quad x \quad 1{,}000{,}000}{17{,}600 \quad x \quad 365 \quad x \quad 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.22 c/mve**	**0.0%**	**71.4%**
Statewide Average*	**0.13 c/mve**	**1.3%**	**47.3%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Intersection Collision Rate Worksheet

The Canopy EIR

Intersection # 5: SR116 (Healdsburg Avenue) & Murphy Avenue

Date of Count: Thursday, May 25, 2023

Number of Collisions: 4
Number of Injuries: 2
Number of Fatalities: 0
Average Daily Traffic (ADT): 16300
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls
Area: Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{4 \quad x \quad 1{,}000{,}000}{16{,}300 \quad x \quad 365 \quad x \quad 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.13 c/mve**	**0.0%**	**50.0%**
Statewide Average*	**0.13 c/mve**	**1.3%**	**47.3%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Intersection # 6: SR 116 (Healdsburg Avenue) & North Main Street

Date of Count: Thursday, May 25, 2023

Number of Collisions: 6
Number of Injuries: 1
Number of Fatalities: 0
Average Daily Traffic (ADT): 16700
Start Date: January 1, 2015
End Date: December 31, 2022
Number of Years: 8

Intersection Type: Tee
Control Type: Signals
Area: Urban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{6 \quad x \quad 1{,}000{,}000}{16{,}700 \quad x \quad 365 \quad x \quad 8}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.12 c/mve**	**0.0%**	**16.7%**
Statewide Average*	**0.28 c/mve**	**0.9%**	**49.1%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

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Appendix B

Intersection Level of Service Calculations

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HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	158	56	111	123	260	46	424	94	221	488	41
Future Volume (veh/h)	50	158	56	111	123	260	46	424	94	221	488	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	184	55	129	143	0	53	493	100	257	567	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	62	198	59	139	154	254	102	403	82	238	587	47
Arrive On Green	0.20	0.20	0.20	0.18	0.18	0.00	0.06	0.30	0.30	0.15	0.38	0.38
Sat Flow, veh/h	313	994	297	775	859	1418	1594	1349	274	1594	1530	121
Grp Volume(v), veh/h	297	0	0	272	0	0	53	0	593	257	0	612
Grp Sat Flow(s),veh/h/ln	1604	0	0	1635	0	1418	1594	0	1623	1594	0	1652
Q Serve(g_s), s	24.4	0.0	0.0	22.0	0.0	0.0	4.3	0.0	40.0	20.0	0.0	48.6
Cycle Q Clear(g_c), s	24.4	0.0	0.0	22.0	0.0	0.0	4.3	0.0	40.0	20.0	0.0	48.6
Prop In Lane	0.20		0.19	0.47		1.00	1.00		0.17	1.00		0.07
Lane Grp Cap(c), veh/h	320	0	0	292	0	254	102	0	485	238	0	634
V/C Ratio(X)	0.93	0.00	0.00	0.93	0.00	0.00	0.52	0.00	1.22	1.08	0.00	0.97
Avail Cap(c_a), veh/h	335	0	0	293	0	254	190	0	485	238	0	634
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	0.0	0.0	54.2	0.0	0.0	60.7	0.0	47.0	57.0	0.0	40.4
Incr Delay (d2), s/veh	31.3	0.0	0.0	35.0	0.0	0.0	1.5	0.0	117.9	81.3	0.0	27.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	0.0	0.0	11.7	0.0	0.0	1.8	0.0	31.4	13.2	0.0	23.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.0	0.0	0.0	89.1	0.0	0.0	62.2	0.0	164.9	138.2	0.0	67.9
LnGrp LOS	F	A	A	F	A	A	E	A	F	F	A	E
Approach Vol, veh/h		297			272			646			869	
Approach Delay, s/veh		84.0			89.1			156.5			88.7	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.3	57.6		32.9	24.7	46.2		30.2
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2
Max Green Setting (Gmax), s	* 16	40.0		28.0	* 20	40.0		24.0
Max Q Clear Time (g_c+I1), s	6.3	50.6		26.4	22.0	42.0		24.0
Green Ext Time (p_c), s	0.0	0.0		0.3	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	109.1
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	52	69	73	35	47	43	390	67	48	477	137
Future Volume (veh/h)	151	52	69	73	35	47	43	390	67	48	477	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	178	61	20	86	41	0	51	459	0	56	561	143
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	160	52	203	213	0	130	752	637	136	582	148
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.00	0.08	0.45	0.00	0.09	0.45	0.45
Sat Flow, veh/h	1594	1198	393	1594	1673	0	1594	1673	1418	1594	1286	328
Grp Volume(v), veh/h	178	0	81	86	41	0	51	459	0	56	0	704
Grp Sat Flow(s),veh/h/ln	1594	0	1591	1594	1673	0	1594	1673	1418	1594	0	1613
Q Serve(g_s), s	9.5	0.0	4.1	4.3	1.9	0.0	2.7	18.2	0.0	2.9	0.0	37.0
Cycle Q Clear(g_c), s	9.5	0.0	4.1	4.3	1.9	0.0	2.7	18.2	0.0	2.9	0.0	37.0
Prop In Lane	1.00		0.25	1.00		0.00	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	213	0	213	203	213	0	130	752	637	136	0	731
V/C Ratio(X)	0.84	0.00	0.38	0.42	0.19	0.00	0.39	0.61	0.00	0.41	0.00	0.96
Avail Cap(c_a), veh/h	274	0	273	347	364	0	274	767	650	274	0	739
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.9	0.0	34.5	35.2	34.1	0.0	38.1	18.3	0.0	37.9	0.0	23.2
Incr Delay (d2), s/veh	13.1	0.0	0.4	0.5	0.2	0.0	0.7	1.7	0.0	0.7	0.0	24.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	1.5	1.7	0.8	0.0	1.0	6.5	0.0	1.1	0.0	17.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.0	0.0	35.0	35.7	34.3	0.0	38.8	19.9	0.0	38.6	0.0	47.6
LnGrp LOS	D	A	C	D	C	A	D	B	A	D	A	D
Approach Vol, veh/h		259			127			510			760	
Approach Delay, s/veh		45.3			35.2			21.8			46.9	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.8	45.4		14.8	11.1	45.0		16.4
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7
Max Green Setting (Gmax), s	15.0	40.0		19.0	15.0	40.0		15.0
Max Q Clear Time (g_c+I1), s	4.7	39.0		6.3	4.9	20.2		11.5
Green Ext Time (p_c), s	0.0	0.6		0.2	0.0	3.6		0.2

Intersection Summary	
HCM 6th Ctrl Delay	38.0
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	12	35	70	7	43	34	418	40	24	533	43
Future Volume (veh/h)	32	12	35	70	7	43	34	418	40	24	533	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	36	14	0	80	8	12	39	475	0	27	606	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	282	91	253	304	32	31	102	726	615	77	700	593
Arrive On Green	0.18	0.18	0.00	0.18	0.18	0.18	0.06	0.43	0.00	0.05	0.42	0.00
Sat Flow, veh/h	1000	511	1418	1092	177	173	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	50	0	0	100	0	0	39	475	0	27	606	0
Grp Sat Flow(s),veh/h/ln	1511	0	1418	1443	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	0.0	0.0	0.0	2.0	0.0	0.0	1.4	13.4	0.0	1.0	19.6	0.0
Cycle Q Clear(g_c), s	1.5	0.0	0.0	3.5	0.0	0.0	1.4	13.4	0.0	1.0	19.6	0.0
Prop In Lane	0.72		1.00	0.80		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	373	0	253	366	0	0	102	726	615	77	700	593
V/C Ratio(X)	0.13	0.00	0.00	0.27	0.00	0.00	0.38	0.65	0.00	0.35	0.87	0.00
Avail Cap(c_a), veh/h	750	0	620	732	0	0	295	844	715	295	844	715
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.7	0.0	0.0	21.5	0.0	0.0	26.7	13.3	0.0	27.4	15.8	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	0.0	0.9	1.8	0.0	1.0	8.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	1.2	0.0	0.0	0.5	4.5	0.0	0.4	7.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	0.0	0.0	21.6	0.0	0.0	27.6	15.1	0.0	28.4	24.6	0.0
LnGrp LOS	C	A	A	C	A	A	C	B	A	C	C	A
Approach Vol, veh/h		50			100			514			633	
Approach Delay, s/veh		20.8			21.6			16.1			24.8	
Approach LOS		C			C			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.5	33.7		18.3	6.6	34.6		18.3				
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7				
Max Green Setting (Gmax), s	11.0	30.0		* 26	11.0	30.0		* 26				
Max Q Clear Time (g_c+I1), s	3.4	21.6		5.5	3.0	15.4		3.5				
Green Ext Time (p_c), s	0.0	3.2		0.3	0.0	3.5		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	20.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln

08/22/2023

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	83	208	139	430	538	112
Future Vol, veh/h	83	208	139	430	538	112
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	250	150	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	95	239	160	494	618	129

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1440	626	622	0	-	0
Stage 1	622	-	-	-	-	-
Stage 2	818	-	-	-	-	-
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	146	484	959	-	-	0
Stage 1	535	-	-	-	-	0
Stage 2	434	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	121	481	956	-	-	-
Mov Cap-2 Maneuver	256	-	-	-	-	-
Stage 1	445	-	-	-	-	-
Stage 2	433	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.8	2.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	956	-	256	481	-
HCM Lane V/C Ratio	0.167	-	0.373	0.497	-
HCM Control Delay (s)	9.5	-	27.2	19.7	-
HCM Lane LOS	A	-	D	C	-
HCM 95th %tile Q(veh)	0.6	-	1.6	2.7	-

HCM 6th TWSC
5: Murphy Ave & Healdsburg Ave 08/22/2023

Intersection						
Int Delay, s/veh	1.7					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	699	52	18	546	37	60
Future Vol, veh/h	699	52	18	546	37	60
Conflicting Peds, #/hr	0	19	13	0	19	13
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	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	794	59	20	620	42	68

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	872	0	1522	856
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	679	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	773	-	130	357
Stage 1	-	-	-	-	422	-
Stage 2	-	-	-	-	504	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	761	-	123	348
Mov Cap-2 Maneuver	-	-	-	-	259	-
Stage 1	-	-	-	-	415	-
Stage 2	-	-	-	-	483	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	23.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	308	-	-	761	-
HCM Lane V/C Ratio	0.358	-	-	0.027	-
HCM Control Delay (s)	23.1	-	-	9.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.6	-	-	0.1	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St 08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	553	0	0	408	135	0	189	0	166	0	129
Future Volume (veh/h)	151	553	0	0	408	135	0	189	0	166	0	129
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	170	621	0	0	458	0	0	212	0	187	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0	2	0	2
Cap, veh/h	198	774	0	0	488	413	0	449	0	216	0	0
Arrive On Green	0.12	0.46	0.00	0.00	0.29	0.00	0.00	0.27	0.00	0.14	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1418	0	1673	0	1594	187	
Grp Volume(v), veh/h	170	621	0	0	458	0	0	212	0	187	58.4	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1418	0	1673	0	1594	E	
Q Serve(g_s), s	10.5	31.9	0.0	0.0	26.8	0.0	0.0	10.7	0.0	11.5		
Cycle Q Clear(g_c), s	10.5	31.9	0.0	0.0	26.8	0.0	0.0	10.7	0.0	11.5		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	198	774	0	0	488	413	0	449	0	216		
V/C Ratio(X)	0.86	0.80	0.00	0.00	0.94	0.00	0.00	0.47	0.00	0.87		
Avail Cap(c_a), veh/h	254	774	0	0	500	424	0	450	0	286		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	43.1	23.1	0.0	0.0	34.7	0.0	0.0	30.8	0.0	42.6		
Incr Delay (d2), s/veh	17.1	6.1	0.0	0.0	25.9	0.0	0.0	1.7	0.0	15.8		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.0	13.3	0.0	0.0	14.3	0.0	0.0	4.5	0.0	5.5		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.3	29.2	0.0	0.0	60.6	0.0	0.0	32.5	0.0	58.4		
LnGrp LOS	E	C	A	A	E	A	A	C	A	E		
Approach Vol, veh/h		791			458			212				
Approach Delay, s/veh		35.9			60.6			32.5				
Approach LOS		D			E			C				
Timer - Assigned Phs		2			5	6	7	8				
Phs Duration (G+Y+Rc), s		52.2			17.2	35.1	18.3	29.9				
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0				
Max Green Setting (Gmax), s		30.0			* 16	30.0	* 18	27.0				
Max Q Clear Time (g_c+I1), s		33.9			12.5	28.8	13.5	12.7				
Green Ext Time (p_c), s		0.0			0.1	0.5	0.1	1.8				

Intersection Summary			
HCM 6th Ctrl Delay			44.9
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Summary Sheet Combining HCM 6th Edition Vehicle Delays at SR 116(Healdsburg Ave-N Main St)/N Main St

AM Existing	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay	
Adjusted Flow Rate (AFR)	170	621	458	0	212	187	0	1648	1436	
HCM Lane Group Delay	60.3	29.2	60.6	0	32.5	58.4	0			
AFR * Lane Group Delay	10251	18133	27755	0	6890	10921	0	73950	67060	
HCM Intersection Delay (s)								44.9	**46.7**	**LOS D**
PM Existing	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay	
Adjusted Flow Rate (AFR)	125	580	571	11	112	171	0	1570	1458	
HCM Lane Group Delay	46.3	25.2	94	22.3	27.7	49.6	0			
AFR * Lane Group Delay	5788	14616	53674	245	3102	8482	0	85907	82804	
HCM Intersection Delay (s)								54.7	**56.8**	**LOS E**
AM Future	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay	
Adjusted Flow Rate (AFR)	205	761	537	81	189	226	0	1999	1810	
HCM Lane Group Delay	83.8	32.9	56	29	48.5	82.5	0			
AFR * Lane Group Delay	17179	25037	30072	2349	9167	18645	0	102448	93282	
HCM Intersection Delay (s)								51.2	**51.5**	**LOS D**
PM Future	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay	
Adjusted Flow Rate (AFR)	94	847	898	14	109	183	0	2145	2036	
HCM Lane Group Delay	143.3	27.8	73.4	17.3	55.6	130.4	0			
AFR * Lane Group Delay	13470	23547	65913	242	6060	23863	0	133096	127035	
HCM Intersection Delay (s)								62.0	**62.4**	**LOS E**
AM Existing plus Project	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay	
Adjusted Flow Rate (AFR)	173	636	464	0	212	187	1	1673	1461	
HCM Lane Group Delay	61.7	30.1	62.5	0	32.9	59.1	0			
AFR * Lane Group Delay	10674	19144	29000	0	6975	11052	0	76844	69869	
HCM Intersection Delay (s)								45.9	**47.8**	**LOS D**
PM Existing plus Project	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay	
Adjusted Flow Rate (AFR)	127	591	585	11	112	171	4	1601	1489	
HCM Lane Group Delay	46.5	25.8	103.9	22.4	27.7	49.7	49.7			
AFR * Lane Group Delay	5906	15248	60782	246	3102	8499	199	93981	90879	
HCM Intersection Delay (s)								58.7	**61.0**	**LOS E**
PM E+P with Retiming	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay	
Adjusted Flow Rate (AFR)	127	591	585	11	112	171	0	1597	1485	
HCM Lane Group Delay	83.5	23.2	69.5	21.1	29.6	91.7	0			
AFR * Lane Group Delay	10605	13711	40658	232	3315	15681	0	84201	80886	
HCM Intersection Delay (s)								52.7	**54.5**	**LOS D**
AM Future plus Project	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay	
Adjusted Flow Rate (AFR)	208	774	542	81	189	226	0	2020	1831	
HCM Lane Group Delay	85.4	33.9	57.1	29.1	49.3	83.6	0			
AFR * Lane Group Delay	17763	26239	30948	2357	9318	18894	0	105518	96201	
HCM Intersection Delay (s)								52.2	**52.5**	**LOS D**
PM Future plus Project	EBL	EBT	WBT	WBR	NBT (ped)	SBL	SBR	Total	Total without ped delay	
Adjusted Flow Rate (AFR)	96	857	911	14	109	183	0	2170	2061	
HCM Lane Group Delay	150	28.5	77.7	17.3	55.6	130.4	0			
AFR * Lane Group Delay	14400	24425	70785	242	6060	23863	0	139775	133715	
HCM Intersection Delay (s)								64.4	**64.9**	**LOS E**

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	158	56	111	123	260	46	424	94	221	488	41
Future Volume (veh/h)	50	158	56	111	123	260	46	424	94	221	488	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	184	55	129	143	0	53	493	100	257	567	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	210	63	153	318	507	116	498	101	267	710	56
Arrive On Green	0.08	0.17	0.17	0.10	0.19	0.00	0.07	0.37	0.37	0.17	0.46	0.46
Sat Flow, veh/h	1594	1237	370	1594	1673	1418	1594	1350	274	1594	1530	121
Grp Volume(v), veh/h	58	0	239	129	143	0	53	0	593	257	0	612
Grp Sat Flow(s),veh/h/ln	1594	0	1607	1594	1673	1418	1594	0	1623	1594	0	1652
Q Serve(g_s), s	3.9	0.0	16.0	8.8	8.3	0.0	3.5	0.0	40.0	17.6	0.0	34.8
Cycle Q Clear(g_c), s	3.9	0.0	16.0	8.8	8.3	0.0	3.5	0.0	40.0	17.6	0.0	34.8
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.17	1.00		0.07
Lane Grp Cap(c), veh/h	120	0	272	153	318	507	116	0	599	267	0	766
V/C Ratio(X)	0.48	0.00	0.88	0.84	0.45	0.00	0.46	0.00	0.99	0.96	0.00	0.80
Avail Cap(c_a), veh/h	145	0	340	155	364	547	145	0	599	267	0	766
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.9	0.0	44.7	49.0	39.5	0.0	49.0	0.0	34.6	45.5	0.0	25.2
Incr Delay (d2), s/veh	1.1	0.0	20.4	30.8	1.4	0.0	1.0	0.0	34.1	44.0	0.0	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	7.6	4.7	3.5	0.0	1.4	0.0	20.4	10.0	0.0	13.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.0	0.0	65.0	79.8	41.0	0.0	50.1	0.0	68.6	89.5	0.0	31.4
LnGrp LOS	D	A	E	E	D	A	D	A	E	F	A	C
Approach Vol, veh/h		297			272			646			869	
Approach Delay, s/veh		62.1			59.4			67.1			48.6	
Approach LOS		E			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	57.4	15.3	24.9	23.2	46.9	13.0	27.2
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 10	49.2	* 11	23.3	* 19	40.7	* 10	24.0
Max Q Clear Time (g_c+I1), s	5.5	36.8	10.8	18.0	19.6	42.0	5.9	10.3
Green Ext Time (p_c), s	0.0	4.1	0.0	0.7	0.0	0.0	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	57.7
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	158	56	111	123	260	46	424	94	221	488	41
Future Volume (veh/h)	50	158	56	111	123	260	46	424	94	221	488	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	184	55	129	143	0	53	493	100	257	567	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	224	190	154	256	468	120	516	105	283	741	59
Arrive On Green	0.08	0.13	0.13	0.10	0.15	0.00	0.08	0.38	0.38	0.18	0.48	0.48
Sat Flow, veh/h	1594	1673	1418	1594	1673	1418	1594	1350	274	1594	1530	121
Grp Volume(v), veh/h	58	184	55	129	143	0	53	0	593	257	0	612
Grp Sat Flow(s),veh/h/ln	1594	1673	1418	1594	1673	1418	1594	0	1623	1594	0	1652
Q Serve(g_s), s	3.6	11.1	3.6	8.3	8.2	0.0	3.3	0.0	37.0	16.5	0.0	31.6
Cycle Q Clear(g_c), s	3.6	11.1	3.6	8.3	8.2	0.0	3.3	0.0	37.0	16.5	0.0	31.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		0.07
Lane Grp Cap(c), veh/h	125	224	190	154	256	468	120	0	621	283	0	800
V/C Ratio(X)	0.47	0.82	0.29	0.84	0.56	0.00	0.44	0.00	0.96	0.91	0.00	0.77
Avail Cap(c_a), veh/h	153	334	283	202	386	579	153	0	635	283	0	800
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.9	43.8	40.6	46.2	40.8	0.0	46.0	0.0	31.3	42.0	0.0	22.0
Incr Delay (d2), s/veh	1.0	12.0	1.2	16.3	2.7	0.0	0.9	0.0	25.1	30.4	0.0	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.1	1.3	3.9	3.5	0.0	1.3	0.0	17.7	8.6	0.0	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.9	55.8	41.8	62.5	43.6	0.0	47.0	0.0	56.4	72.4	0.0	26.7
LnGrp LOS	D	E	D	E	D	A	D	A	E	E	A	C
Approach Vol, veh/h		297			272			646			869	
Approach Delay, s/veh		51.5			52.5			55.6			40.2	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	56.6	14.8	20.2	23.2	46.0	12.8	22.1
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 10	49.2	* 13	20.8	* 19	40.7	* 10	24.0
Max Q Clear Time (g_c+I1), s	5.3	33.6	10.3	13.1	18.5	39.0	5.6	10.2
Green Ext Time (p_c), s	0.0	4.6	0.0	0.8	0.0	0.8	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	48.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Intersection				
Intersection Delay, s/veh	26.8			
Intersection LOS	D			

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	307	574	655	872
Demand Flow Rate, veh/h	313	586	668	889
Vehicles Circulating, veh/h	972	616	509	332
Vehicles Exiting, veh/h	249	561	776	870
Ped Vol Crossing Leg, #/h	0	2	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	20.8	25.5	24.9	31.2
Approach LOS	C	D	C	D

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	313	586	668	889
Cap Entry Lane, veh/h	512	736	821	984
Entry HV Adj Factor	0.982	0.980	0.981	0.981
Flow Entry, veh/h	307	574	655	872
Cap Entry, veh/h	503	721	805	964
V/C Ratio	0.611	0.796	0.814	0.904
Control Delay, s/veh	20.8	25.5	24.9	31.2
LOS	C	D	C	D
95th %tile Queue, veh	4	8	9	13

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	167	97	87	162	198	108	511	80	240	513	46
Future Volume (veh/h)	87	167	97	87	162	198	108	511	80	240	513	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	92	176	88	92	171	0	114	538	78	253	540	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	84	162	81	100	185	246	135	423	61	237	551	45
Arrive On Green	0.21	0.21	0.21	0.17	0.17	0.00	0.08	0.30	0.30	0.15	0.36	0.36
Sat Flow, veh/h	406	777	388	575	1069	1418	1594	1424	206	1594	1527	124
Grp Volume(v), veh/h	356	0	0	263	0	0	114	0	616	253	0	584
Grp Sat Flow(s),veh/h/ln	1571	0	0	1645	0	1418	1594	0	1630	1594	0	1651
Q Serve(g_s), s	28.0	0.0	0.0	21.2	0.0	0.0	9.5	0.0	40.0	20.0	0.0	47.1
Cycle Q Clear(g_c), s	28.0	0.0	0.0	21.2	0.0	0.0	9.5	0.0	40.0	20.0	0.0	47.1
Prop In Lane	0.26		0.25	0.35		1.00	1.00		0.13	1.00		0.08
Lane Grp Cap(c), veh/h	327	0	0	285	0	246	135	0	484	237	0	596
V/C Ratio(X)	1.09	0.00	0.00	0.92	0.00	0.00	0.85	0.00	1.27	1.07	0.00	0.98
Avail Cap(c_a), veh/h	327	0	0	293	0	253	189	0	484	237	0	596
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.3	0.0	0.0	54.8	0.0	0.0	60.8	0.0	47.3	57.3	0.0	42.5
Incr Delay (d2), s/veh	75.9	0.0	0.0	33.0	0.0	0.0	16.0	0.0	137.8	77.9	0.0	31.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.5	0.0	0.0	11.3	0.0	0.0	4.4	0.0	34.2	13.0	0.0	23.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	129.2	0.0	0.0	87.8	0.0	0.0	76.8	0.0	185.1	135.2	0.0	74.2
LnGrp LOS	F	A	A	F	A	A	E	A	F	F	A	E
Approach Vol, veh/h		356			263			730			837	
Approach Delay, s/veh		129.2			87.8			168.2			92.6	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.1	54.8		34.2	24.7	46.2		29.5
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2
Max Green Setting (Gmax), s	* 16	40.0		28.0	* 20	40.0		24.0
Max Q Clear Time (g_c+I1), s	11.5	49.1		30.0	22.0	42.0		23.2
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.1

Intersection Summary			
HCM 6th Ctrl Delay			123.2
HCM 6th LOS			F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	11	86	18	4	11	58	481	6	4	604	132
Future Volume (veh/h)	165	11	86	18	4	11	58	481	6	4	604	132
Initial Q (Qb), veh	0	0	0	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	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	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			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	168	11	0	18	4	0	59	491	0	4	616	123
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	220	231	0	85	89	0	147	951	806	17	656	131
Arrive On Green	0.14	0.14	0.00	0.05	0.05	0.00	0.09	0.57	0.00	0.01	0.49	0.49
Sat Flow, veh/h	1594	1673	0	1594	1673	0	1594	1673	1418	1594	1349	269
Grp Volume(v), veh/h	168	11	0	18	4	0	59	491	0	4	0	739
Grp Sat Flow(s),veh/h/ln	1594	1673	0	1594	1673	0	1594	1673	1418	1594	0	1618
Q Serve(g_s), s	7.9	0.4	0.0	0.8	0.2	0.0	2.7	14.0	0.0	0.2	0.0	33.7
Cycle Q Clear(g_c), s	7.9	0.4	0.0	0.8	0.2	0.0	2.7	14.0	0.0	0.2	0.0	33.7
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	220	231	0	85	89	0	147	951	806	17	0	788
V/C Ratio(X)	0.76	0.05	0.00	0.21	0.04	0.00	0.40	0.52	0.00	0.24	0.00	0.94
Avail Cap(c_a), veh/h	306	322	0	388	407	0	306	951	806	306	0	829
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.4	29.2	0.0	35.4	35.0	0.0	33.4	10.3	0.0	38.3	0.0	18.9
Incr Delay (d2), s/veh	4.3	0.0	0.0	0.5	0.1	0.0	0.7	0.7	0.0	2.6	0.0	17.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.2	0.0	0.3	0.1	0.0	1.0	4.2	0.0	0.1	0.0	14.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.7	29.2	0.0	35.8	35.1	0.0	34.0	10.9	0.0	40.9	0.0	36.9
LnGrp LOS	D	C	A	D	D	A	C	B	A	D	A	D
Approach Vol, veh/h		179			22			550			743	
Approach Delay, s/veh		36.2			35.7			13.4			36.9	
Approach LOS		D			D			B			D	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	10.9	43.8	7.9	4.5	50.2	15.5
Change Period (Y+Rc), s	3.7	5.8	3.7	3.7	5.8	4.7
Max Green Setting (Gmax), s	15.0	40.0	19.0	15.0	40.0	15.0
Max Q Clear Time (g_c+I1), s	4.7	35.7	2.8	2.2	16.0	9.9
Green Ext Time (p_c), s	0.0	2.3	0.0	0.0	4.2	0.1

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	6	77	45	14	25	66	487	34	19	598	65
Future Volume (veh/h)	68	6	77	45	14	25	66	487	34	19	598	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		1.00	0.98		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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	70	6	0	46	14	0	68	502	0	20	616	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	350	25	268	300	77	0	139	773	655	59	690	584
Arrive On Green	0.19	0.19	0.00	0.19	0.19	0.00	0.09	0.46	0.00	0.04	0.41	0.00
Sat Flow, veh/h	1290	134	1418	1070	409	0	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	76	0	0	60	0	0	68	502	0	20	616	0
Grp Sat Flow(s),veh/h/ln	1424	0	1418	1479	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	0.7	0.0	0.0	0.0	0.0	0.0	2.6	14.9	0.0	0.8	22.2	0.0
Cycle Q Clear(g_c), s	2.7	0.0	0.0	2.0	0.0	0.0	2.6	14.9	0.0	0.8	22.2	0.0
Prop In Lane	0.92		1.00	0.77		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	376	0	268	377	0	0	139	773	655	59	690	584
V/C Ratio(X)	0.20	0.00	0.00	0.16	0.00	0.00	0.49	0.65	0.00	0.34	0.89	0.00
Avail Cap(c_a), veh/h	672	0	569	684	0	0	271	775	657	271	775	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.4	0.0	0.0	22.1	0.0	0.0	28.2	13.4	0.0	30.4	17.7	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	0.0	1.0	2.2	0.0	1.2	12.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.7	0.0	0.0	1.0	5.2	0.0	0.3	9.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.5	0.0	0.0	22.2	0.0	0.0	29.2	15.6	0.0	31.6	30.1	0.0
LnGrp LOS	C	A	A	C	A	A	C	B	A	C	C	A
Approach Vol, veh/h		76			60			570			636	
Approach Delay, s/veh		22.5			22.2			17.2			30.2	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	9.3	35.5	19.9	6.1	38.7	19.9
Change Period (Y+Rc), s	3.7	8.8	* 7.7	3.7	8.8	* 7.7
Max Green Setting (Gmax), s	11.0	30.0	* 26	11.0	30.0	* 26
Max Q Clear Time (g_c+I1), s	4.6	24.2	4.0	2.8	16.9	4.7
Green Ext Time (p_c), s	0.0	2.5	0.1	0.0	3.5	0.2

Intersection Summary	
HCM 6th Ctrl Delay	23.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln 08/22/2023

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	78	199	203	555	595	131
Future Vol, veh/h	78	199	203	555	595	131
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	250	150	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	81	207	211	578	620	136

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1628	628	624	0	-	0
Stage 1	624	-	-	-	-	-
Stage 2	1004	-	-	-	-	-
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	112	483	957	-	-	0
Stage 1	534	-	-	-	-	0
Stage 2	354	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	87	480	954	-	-	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	415	-	-	-	-	-
Stage 2	353	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22	2.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	954	-	213	480	-
HCM Lane V/C Ratio	0.222	-	0.381	0.432	-
HCM Control Delay (s)	9.8	-	32	18.1	-
HCM Lane LOS	A	-	D	C	-
HCM 95th %tile Q(veh)	0.8	-	1.7	2.1	-

HCM 6th TWSC
5: Murphy Ave & Healdsburg Ave 08/22/2023

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	727	66	25	752	22	41
Future Vol, veh/h	727	66	25	752	22	41
Conflicting Peds, #/hr	0	27	19	0	27	19
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	749	68	26	775	23	42

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	844	0	1664	829
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	854	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	792	-	107	370
Stage 1	-	-	-	-	438	-
Stage 2	-	-	-	-	417	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	774	-	99	356
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	394	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	20.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	300	-	-	774	-
HCM Lane V/C Ratio	0.216	-	-	0.033	-
HCM Control Delay (s)	20.3	-	-	9.8	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St 08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	563	0	0	554	116	0	109	0	166	0	144
Future Volume (veh/h)	121	563	0	0	554	116	0	109	0	166	0	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	125	580	0	0	571	11	0	112	0	171	0	0
Peak Hour Factor	0.97	0.97	0.97	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	0	2	0	2	0	2
Cap, veh/h	152	772	0	0	530	439	0	452	0	201	0	0
Arrive On Green	0.10	0.46	0.00	0.00	0.32	0.32	0.00	0.27	0.00	0.13	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1387	0	1673	0	1594	171	
Grp Volume(v), veh/h	125	580	0	0	571	11	0	112	0	171	49.6	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1387	0	1673	0	1594	D	
Q Serve(g_s), s	7.3	27.1	0.0	0.0	30.0	0.5	0.0	5.0	0.0	10.0		
Cycle Q Clear(g_c), s	7.3	27.1	0.0	0.0	30.0	0.5	0.0	5.0	0.0	10.0		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	152	772	0	0	530	439	0	452	0	201		
V/C Ratio(X)	0.82	0.75	0.00	0.00	1.08	0.03	0.00	0.25	0.00	0.85		
Avail Cap(c_a), veh/h	269	772	0	0	530	439	0	477	0	303		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	42.1	21.0	0.0	0.0	32.4	22.3	0.0	27.1	0.0	40.5		
Incr Delay (d2), s/veh	4.2	4.1	0.0	0.0	61.7	0.0	0.0	0.6	0.0	9.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.0	10.9	0.0	0.0	21.0	0.2	0.0	2.0	0.0	4.4		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	25.2	0.0	0.0	94.0	22.3	0.0	27.7	0.0	49.6		
LnGrp LOS	D	C	A	A	F	C	A	C	A	D		
Approach Vol, veh/h		705			582			112				
Approach Delay, s/veh		28.9			92.7			27.7				
Approach LOS		C			F			C				
Timer - Assigned Phs		2			5	6	7	8				
Phs Duration (G+Y+Rc), s		49.5			13.7	35.8	16.6	28.6				
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0				
Max Green Setting (Gmax), s		30.0			* 16	30.0	* 18	27.0				
Max Q Clear Time (g_c+I1), s		29.1			9.3	32.0	12.0	7.0				
Green Ext Time (p_c), s		0.4			0.1	0.0	0.1	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			54.7									
HCM 6th LOS			D									

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	167	97	87	162	198	108	511	80	240	513	46
Future Volume (veh/h)	87	167	97	87	162	198	108	511	80	240	513	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	92	176	88	92	171	0	114	538	78	253	540	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	192	96	125	309	501	136	556	81	270	724	59
Arrive On Green	0.08	0.18	0.18	0.08	0.18	0.00	0.09	0.39	0.39	0.17	0.47	0.47
Sat Flow, veh/h	1594	1042	521	1594	1673	1418	1594	1424	206	1594	1527	124
Grp Volume(v), veh/h	92	0	264	92	171	0	114	0	616	253	0	584
Grp Sat Flow(s),veh/h/ln	1594	0	1563	1594	1673	1418	1594	0	1630	1594	0	1651
Q Serve(g_s), s	6.9	0.0	20.3	6.9	11.4	0.0	8.6	0.0	45.3	19.2	0.0	35.2
Cycle Q Clear(g_c), s	6.9	0.0	20.3	6.9	11.4	0.0	8.6	0.0	45.3	19.2	0.0	35.2
Prop In Lane	1.00		0.33	1.00		1.00	1.00		0.13	1.00		0.08
Lane Grp Cap(c), veh/h	125	0	288	125	309	501	136	0	636	270	0	783
V/C Ratio(X)	0.74	0.00	0.92	0.74	0.55	0.00	0.84	0.00	0.97	0.94	0.00	0.75
Avail Cap(c_a), veh/h	134	0	307	134	328	518	171	0	642	270	0	783
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	55.2	0.0	49.0	55.2	45.3	0.0	55.2	0.0	36.6	50.2	0.0	26.2
Incr Delay (d2), s/veh	15.3	0.0	30.4	15.3	2.4	0.0	20.9	0.0	27.7	38.1	0.0	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	10.0	3.3	4.9	0.0	4.2	0.0	21.9	10.3	0.0	13.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.5	0.0	79.3	70.5	47.7	0.0	76.1	0.0	64.3	88.3	0.0	30.4
LnGrp LOS	E	A	E	E	D	A	E	A	E	F	A	C
Approach Vol, veh/h		356			263			730			837	
Approach Delay, s/veh		77.0			55.7			66.1			47.9	
Approach LOS		E			E			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.1	64.2	14.3	28.8	25.4	54.0	14.3	28.8				
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2				
Max Green Setting (Gmax), s	* 13	55.8	* 10	24.0	* 21	48.2	* 10	24.0				
Max Q Clear Time (g_c+I1), s	10.6	37.2	8.9	22.3	21.2	47.3	8.9	13.4				
Green Ext Time (p_c), s	0.0	4.8	0.0	0.3	0.0	0.4	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			59.7									
HCM 6th LOS			E									

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	167	97	87	162	198	108	511	80	240	513	46
Future Volume (veh/h)	87	167	97	87	162	198	108	511	80	240	513	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	92	176	88	92	171	0	114	538	78	253	540	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	138	219	181	138	219	434	143	578	84	279	750	61
Arrive On Green	0.09	0.13	0.13	0.09	0.13	0.00	0.09	0.41	0.41	0.17	0.49	0.49
Sat Flow, veh/h	1594	1673	1378	1594	1673	1418	1594	1424	206	1594	1527	124
Grp Volume(v), veh/h	92	176	88	92	171	0	114	0	616	253	0	584
Grp Sat Flow(s),veh/h/ln	1594	1673	1378	1594	1673	1418	1594	0	1630	1594	0	1651
Q Serve(g_s), s	6.0	11.0	6.4	6.0	10.7	0.0	7.6	0.0	39.0	16.8	0.0	30.1
Cycle Q Clear(g_c), s	6.0	11.0	6.4	6.0	10.7	0.0	7.6	0.0	39.0	16.8	0.0	30.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.08
Lane Grp Cap(c), veh/h	138	219	181	138	219	434	143	0	662	279	0	811
V/C Ratio(X)	0.67	0.80	0.49	0.67	0.78	0.00	0.80	0.00	0.93	0.91	0.00	0.72
Avail Cap(c_a), veh/h	152	362	298	161	372	563	193	0	727	305	0	852
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.8	45.6	43.6	47.8	45.4	0.0	48.2	0.0	30.7	43.7	0.0	21.7
Incr Delay (d2), s/veh	6.8	9.3	2.9	5.3	8.3	0.0	11.0	0.0	18.2	26.6	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	5.0	2.3	2.6	4.8	0.0	3.3	0.0	17.5	8.4	0.0	11.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	54.9	46.5	53.2	53.7	0.0	59.2	0.0	48.9	70.3	0.0	24.8
LnGrp LOS	D	D	D	D	D	A	E	A	D	E	A	C
Approach Vol, veh/h		356			263			730			837	
Approach Delay, s/veh		52.8			53.5			50.5			38.6	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.4	59.3	14.1	20.4	23.6	50.0	14.1	20.4
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 13	55.8	* 11	23.4	* 21	48.2	* 10	24.0
Max Q Clear Time (g_c+I1), s	9.6	32.1	8.0	13.0	18.8	41.0	8.0	12.7
Green Ext Time (p_c), s	0.0	5.2	0.0	1.1	0.1	2.9	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	46.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Intersection	
Intersection Delay, s/veh	33.1
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	370	471	736	841
Demand Flow Rate, veh/h	378	480	751	858
Vehicles Circulating, veh/h	903	759	532	384
Vehicles Exiting, veh/h	339	524	749	855
Ped Vol Crossing Leg, #/h	1	2	0	1
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	23.6	25.1	41.1	34.7
Approach LOS	C	D	E	D

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	378	480	751	858
Cap Entry Lane, veh/h	549	636	802	933
Entry HV Adj Factor	0.980	0.980	0.980	0.980
Flow Entry, veh/h	370	471	736	841
Cap Entry, veh/h	538	624	786	914
V/C Ratio	0.688	0.755	0.936	0.920
Control Delay, s/veh	23.6	25.1	41.1	34.7
LOS	C	D	E	D
95th %tile Queue, veh	5	7	14	14

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	233	73	221	138	303	52	499	212	321	630	41
Future Volume (veh/h)	50	233	73	221	138	303	52	499	212	321	630	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	271	75	257	160	50	60	580	238	373	733	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	35	164	45	199	124	282	98	389	160	237	675	41
Arrive On Green	0.15	0.15	0.15	0.20	0.20	0.20	0.06	0.35	0.35	0.15	0.43	0.43
Sat Flow, veh/h	231	1079	299	1001	623	1418	1594	1126	462	1594	1560	96
Grp Volume(v), veh/h	404	0	0	417	0	50	60	0	818	373	0	778
Grp Sat Flow(s),veh/h/ln	1608	0	0	1623	0	1418	1594	0	1589	1594	0	1656
Q Serve(g_s), s	22.8	0.0	0.0	29.8	0.0	4.4	5.5	0.0	51.8	22.3	0.0	64.9
Cycle Q Clear(g_c), s	22.8	0.0	0.0	29.8	0.0	4.4	5.5	0.0	51.8	22.3	0.0	64.9
Prop In Lane	0.14		0.19	0.62		1.00	1.00		0.29	1.00		0.06
Lane Grp Cap(c), veh/h	244	0	0	323	0	282	98	0	549	237	0	717
V/C Ratio(X)	1.65	0.00	0.00	1.29	0.00	0.18	0.62	0.00	1.49	1.57	0.00	1.09
Avail Cap(c_a), veh/h	244	0	0	323	0	282	106	0	549	237	0	717
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.6	0.0	0.0	60.1	0.0	49.9	68.7	0.0	49.1	63.8	0.0	42.5
Incr Delay (d2), s/veh	311.3	0.0	0.0	153.0	0.0	0.4	5.7	0.0	230.5	277.8	0.0	59.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.2	0.0	0.0	25.8	0.0	1.6	2.4	0.0	55.0	27.2	0.0	37.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	374.9	0.0	0.0	213.1	0.0	50.3	74.4	0.0	279.6	341.6	0.0	101.7
LnGrp LOS	F	A	A	F	A	D	E	A	F	F	A	F
Approach Vol, veh/h		404			467			878			1151	
Approach Delay, s/veh		374.9			195.7			265.6			179.4	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.9	71.1		29.0	27.0	58.0		36.0				
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2				
Max Green Setting (Gmax), s	* 10	64.1		22.8	* 22	51.8		29.8				
Max Q Clear Time (g_c+I1), s	7.5	66.9		24.8	24.3	53.8		31.8				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	235.4
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	52	97	73	35	47	36	441	67	48	591	135
Future Volume (veh/h)	180	52	97	73	35	47	36	441	67	48	591	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	180	52	45	73	35	0	36	441	0	48	591	120
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	217	111	96	202	212	0	107	748	634	127	620	126
Arrive On Green	0.14	0.14	0.14	0.13	0.13	0.00	0.07	0.45	0.00	0.08	0.46	0.46
Sat Flow, veh/h	1594	817	707	1594	1673	0	1594	1673	1418	1594	1349	274
Grp Volume(v), veh/h	180	0	97	73	35	0	36	441	0	48	0	711
Grp Sat Flow(s),veh/h/ln	1594	0	1524	1594	1673	0	1594	1673	1418	1594	0	1623
Q Serve(g_s), s	9.3	0.0	5.0	3.6	1.6	0.0	1.8	16.8	0.0	2.4	0.0	35.8
Cycle Q Clear(g_c), s	9.3	0.0	5.0	3.6	1.6	0.0	1.8	16.8	0.0	2.4	0.0	35.8
Prop In Lane	1.00		0.46	1.00		0.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	217	0	207	202	212	0	107	748	634	127	0	745
V/C Ratio(X)	0.83	0.00	0.47	0.36	0.17	0.00	0.34	0.59	0.00	0.38	0.00	0.95
Avail Cap(c_a), veh/h	282	0	269	357	374	0	282	788	668	282	0	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.7	0.0	33.9	33.9	33.1	0.0	37.8	17.6	0.0	37.1	0.0	22.1
Incr Delay (d2), s/veh	11.9	0.0	0.6	0.4	0.1	0.0	0.7	1.3	0.0	0.7	0.0	21.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	1.8	1.4	0.6	0.0	0.7	6.0	0.0	0.9	0.0	16.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.7	0.0	34.5	34.3	33.2	0.0	38.5	19.0	0.0	37.8	0.0	44.0
LnGrp LOS	D	A	C	C	C	A	D	B	A	D	A	D
Approach Vol, veh/h		277			108			477			759	
Approach Delay, s/veh		43.0			34.0			20.4			43.6	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	44.8		14.5	10.5	43.7		16.2				
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7				
Max Green Setting (Gmax), s	15.0	40.0		19.0	15.0	40.0		15.0				
Max Q Clear Time (g_c+I1), s	11.3	37.8		5.6	4.4	18.8		11.3				
Green Ext Time (p_c), s	0.0	1.2		0.1	0.0	3.5		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	36.0
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	12	37	70	10	43	40	562	35	24	667	43
Future Volume (veh/h)	32	12	37	70	10	43	40	562	35	24	667	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	32	12	2	70	10	10	40	562	-5	24	667	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	85	239	265	36	25	102	773	655	70	739	626
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.06	0.46	0.00	0.04	0.44	0.00
Sat Flow, veh/h	1020	502	1410	956	216	146	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	44	0	2	90	0	0	40	562	-5	24	667	0
Grp Sat Flow(s),veh/h/ln	1522	0	1410	1318	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	0.0	0.0	0.1	2.9	0.0	0.0	1.5	16.9	0.0	0.9	23.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	0.1	4.3	0.0	0.0	1.5	16.9	0.0	0.9	23.0	0.0
Prop In Lane	0.73		1.00	0.78		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	358	0	239	326	0	0	102	773	655	70	739	626
V/C Ratio(X)	0.12	0.00	0.01	0.28	0.00	0.00	0.39	0.73	-0.01	0.34	0.90	0.00
Avail Cap(c_a), veh/h	721	0	591	681	0	0	282	809	685	282	809	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.0	0.0	21.5	23.4	0.0	0.0	27.9	13.5	0.0	28.8	16.1	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.2	0.0	0.0	0.9	3.5	0.0	1.1	13.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.1	0.0	0.0	0.6	6.0	0.0	0.3	9.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.1	0.0	21.5	23.6	0.0	0.0	28.8	17.0	0.0	29.9	29.3	0.0
LnGrp LOS	C	A	C	C	A	A	C	B	A	C	C	A
Approach Vol, veh/h		46			90			597			691	
Approach Delay, s/veh		22.0			23.6			18.0			29.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.7	36.2		18.2	6.4	37.5		18.2
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7
Max Green Setting (Gmax), s	11.0	30.0		* 26	11.0	30.0		* 26
Max Q Clear Time (g_c+I1), s	3.5	25.0		6.3	2.9	18.9		3.4
Green Ext Time (p_c), s	0.0	2.4		0.2	0.0	3.6		0.1

Intersection Summary		
HCM 6th Ctrl Delay		24.0
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln

09/14/2023

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	113	228	155	531	663	93
Future Vol, veh/h	113	228	155	531	663	93
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	250	150	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	113	228	155	531	663	93

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1512	671	667	0	-	0
Stage 1	667	-	-	-	-	-
Stage 2	845	-	-	-	-	-
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	132	456	923	-	-	0
Stage 1	510	-	-	-	-	0
Stage 2	421	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 109	453	920	-	-	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	423	-	-	-	-	-
Stage 2	420	-	-	-	-	-

Approach	EB		NB		SB
HCM Control Delay, s	24.5		2.2		0
HCM LOS	C				

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	920	-	242	453	-
HCM Lane V/C Ratio	0.168	-	0.467	0.503	-
HCM Control Delay (s)	9.7	-	32.3	20.7	-
HCM Lane LOS	A	-	D	C	-
HCM 95th %tile Q(veh)	0.6	-	2.3	2.8	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th TWSC
5: Murphy Ave & Healdsburg Ave

08/25/2023

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	847	54	22	645	45	111
Future Vol, veh/h	847	54	22	645	45	111
Conflicting Peds, #/hr	0	19	13	0	19	13
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	847	54	22	645	45	111

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	920	0	1601	906
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	708	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	742	-	117	334
Stage 1	-	-	-	-	400	-
Stage 2	-	-	-	-	488	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	730	-	110	325
Mov Cap-2 Maneuver	-	-	-	-	245	-
Stage 1	-	-	-	-	394	-
Stage 2	-	-	-	-	466	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	29.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	297	-	-	730	-
HCM Lane V/C Ratio	0.525	-	-	0.03	-
HCM Control Delay (s)	29.8	-	-	10.1	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.9	-	-	0.1	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	761	0	0	537	216	0	189	0	226	0	145
Future Volume (veh/h)	205	761	0	0	537	216	0	189	0	226	0	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	205	761	0	0	537	81	0	189	0	226	0	16
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0	2	0	2
Cap, veh/h	227	888	0	0	589	487	0	350	0	248	0	0
Arrive On Green	0.14	0.53	0.00	0.00	0.35	0.35	0.00	0.21	0.00	0.16	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1385	0	1673	0	1594	226	
Grp Volume(v), veh/h	205	761	0	0	537	81	0	189	0	226	82.5	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1385	0	1673	0	1594	F	
Q Serve(g_s), s	16.3	50.5	0.0	0.0	39.5	5.2	0.0	13.0	0.0	18.0		
Cycle Q Clear(g_c), s	16.3	50.5	0.0	0.0	39.5	5.2	0.0	13.0	0.0	18.0		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	227	888	0	0	589	487	0	350	0	248		
V/C Ratio(X)	0.90	0.86	0.00	0.00	0.91	0.17	0.00	0.54	0.00	0.91		
Avail Cap(c_a), veh/h	251	1001	0	0	677	560	0	350	0	275		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	54.4	26.1	0.0	0.0	39.9	28.8	0.0	45.5	0.0	53.6		
Incr Delay (d2), s/veh	29.3	6.8	0.0	0.0	16.1	0.2	0.0	3.0	0.0	28.9		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	8.4	21.1	0.0	0.0	18.9	1.8	0.0	5.8	0.0	9.3		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.8	32.9	0.0	0.0	56.0	29.0	0.0	48.5	0.0	82.5		
LnGrp LOS	F	C	A	A	E	C	A	D	A	F		
Approach Vol, veh/h		966			618			189				
Approach Delay, s/veh		43.7			52.5			48.5				
Approach LOS		D			D			D				

Timer - Assigned Phs		2			5	6	7	8				
Phs Duration (G+Y+Rc), s		74.3			23.1	51.2	24.8	30.0				
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0				
Max Green Setting (Gmax), s		77.2			* 20	52.2	* 22	27.0				
Max Q Clear Time (g_c+I1), s		52.5			18.3	41.5	20.0	15.0				
Green Ext Time (p_c), s		6.0			0.1	3.9	0.1	1.4				

Intersection Summary	
HCM 6th Ctrl Delay	51.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	233	73	221	138	303	52	499	212	321	630	41
Future Volume (veh/h)	50	233	73	221	138	303	52	499	212	321	630	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	271	75	257	160	50	60	580	238	373	733	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	207	57	212	393	590	100	418	172	289	764	47
Arrive On Green	0.06	0.16	0.16	0.13	0.23	0.23	0.06	0.37	0.37	0.18	0.49	0.49
Sat Flow, veh/h	1594	1262	349	1594	1673	1418	1594	1127	462	1594	1560	96
Grp Volume(v), veh/h	58	0	346	257	160	50	60	0	818	373	0	778
Grp Sat Flow(s),veh/h/ln	1594	0	1611	1594	1673	1418	1594	0	1589	1594	0	1656
Q Serve(g_s), s	5.1	0.0	23.8	19.3	11.7	3.1	5.3	0.0	53.8	26.3	0.0	65.6
Cycle Q Clear(g_c), s	5.1	0.0	23.8	19.3	11.7	3.1	5.3	0.0	53.8	26.3	0.0	65.6
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.29	1.00		0.06
Lane Grp Cap(c), veh/h	99	0	264	212	393	590	100	0	589	289	0	811
V/C Ratio(X)	0.58	0.00	1.31	1.21	0.41	0.08	0.60	0.00	1.39	1.29	0.00	0.96
Avail Cap(c_a), veh/h	146	0	264	212	393	590	131	0	589	289	0	811
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.2	0.0	60.6	62.8	46.9	25.6	66.2	0.0	45.6	59.3	0.0	35.6
Incr Delay (d2), s/veh	2.0	0.0	163.5	130.6	1.0	0.1	2.1	0.0	184.7	154.1	0.0	22.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	21.4	15.4	5.0	1.1	2.2	0.0	50.6	22.7	0.0	30.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.2	0.0	224.1	193.4	47.9	25.7	68.3	0.0	230.3	213.4	0.0	57.9
LnGrp LOS	E	A	F	F	D	C	E	A	F	F	A	E
Approach Vol, veh/h		404			467			878			1151	
Approach Delay, s/veh		201.7			125.6			219.3			108.3	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.8	77.2	24.0	30.0	31.0	60.0	13.7	40.3
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 12	68.2	* 19	23.8	* 26	53.8	* 13	29.8
Max Q Clear Time (g_c+I1), s	7.3	67.6	21.3	25.8	28.3	55.8	7.1	13.7
Green Ext Time (p_c), s	0.0	0.4	0.0	0.0	0.0	0.0	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	157.7
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	233	73	221	138	303	52	499	212	321	630	41
Future Volume (veh/h)	50	233	73	221	138	303	52	499	212	321	630	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	271	75	257	160	50	60	580	238	373	733	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	229	194	212	347	551	100	449	184	289	807	50
Arrive On Green	0.06	0.14	0.14	0.13	0.21	0.21	0.06	0.40	0.40	0.18	0.52	0.52
Sat Flow, veh/h	1594	1673	1418	1594	1673	1418	1594	1127	462	1594	1560	96
Grp Volume(v), veh/h	58	271	75	257	160	50	60	0	818	373	0	778
Grp Sat Flow(s),veh/h/ln	1594	1673	1418	1594	1673	1418	1594	0	1589	1594	0	1656
Q Serve(g_s), s	5.1	19.8	7.0	19.3	12.2	3.2	5.3	0.0	57.8	26.3	0.0	62.0
Cycle Q Clear(g_c), s	5.1	19.8	7.0	19.3	12.2	3.2	5.3	0.0	57.8	26.3	0.0	62.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.29	1.00		0.06
Lane Grp Cap(c), veh/h	99	229	194	212	347	551	100	0	633	289	0	857
V/C Ratio(X)	0.58	1.19	0.39	1.21	0.46	0.09	0.60	0.00	1.29	1.29	0.00	0.91
Avail Cap(c_a), veh/h	129	229	194	212	347	551	126	0	633	289	0	857
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.2	62.6	57.1	62.8	50.4	28.1	66.2	0.0	43.6	59.3	0.0	31.9
Incr Delay (d2), s/veh	2.0	119.0	1.8	130.6	1.4	0.1	2.1	0.0	142.8	154.1	0.0	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	15.7	2.6	15.4	5.2	1.1	2.2	0.0	46.9	22.7	0.0	26.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.2	181.6	58.9	193.4	51.7	28.2	68.3	0.0	186.4	213.4	0.0	45.5
LnGrp LOS	E	F	E	F	D	C	E	A	F	F	A	D
Approach Vol, veh/h		404			467			878			1151	
Approach Delay, s/veh		142.5			127.2			178.3			99.9	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.8	81.2	24.0	26.0	31.0	64.0	13.7	36.3
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 12	72.6	* 19	19.8	* 26	57.8	* 12	27.4
Max Q Clear Time (g_c+I1), s	7.3	64.0	21.3	21.8	28.3	59.8	7.1	14.2
Green Ext Time (p_c), s	0.0	4.2	0.0	0.0	0.0	0.0	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	134.0
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Intersection	
Intersection Delay, s/veh	175.6
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	414	769	887	1154
Demand Flow Rate, veh/h	422	784	905	1177
Vehicles Circulating, veh/h	1390	712	715	486
Vehicles Exiting, veh/h	273	908	1097	1010
Ped Vol Crossing Leg, #/h	0	2	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	173.6	116.6	191.2	203.6
Approach LOS	F	F	F	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	422	784	905	1177
Cap Entry Lane, veh/h	334	668	665	841
Entry HV Adj Factor	0.980	0.981	0.981	0.981
Flow Entry, veh/h	414	769	887	1154
Cap Entry, veh/h	328	654	653	824
V/C Ratio	1.262	1.175	1.360	1.400
Control Delay, s/veh	173.6	116.6	191.2	203.6
LOS	F	F	F	F
95th %tile Queue, veh	19	26	38	50

HCM 6th Roundabout
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln 08/25/2023

Intersection	
Intersection Delay, s/veh	11.4
Intersection LOS	B

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	341	686	756
Demand Flow Rate, veh/h	348	700	771
Vehicles Circulating, veh/h	676	115	158
Vehicles Exiting, veh/h	253	909	657
Ped Vol Crossing Leg, #/h	4	4	4
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	13.1	9.7	12.2
Approach LOS	B	A	B

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	348	700	771
Cap Entry Lane, veh/h	692	1227	1174
Entry HV Adj Factor	0.980	0.981	0.980
Flow Entry, veh/h	341	686	756
Cap Entry, veh/h	678	1203	1151
V/C Ratio	0.503	0.571	0.657
Control Delay, s/veh	13.1	9.7	12.2
LOS	B	A	B
95th %tile Queue, veh	3	4	5

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	196	104	222	214	302	122	668	191	330	645	46
Future Volume (veh/h)	87	196	104	222	214	302	122	668	191	330	645	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	87	196	91	222	214	104	122	668	185	330	645	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	56	125	58	171	164	290	126	433	120	226	634	41
Arrive On Green	0.15	0.15	0.15	0.21	0.21	0.21	0.08	0.35	0.35	0.14	0.41	0.41
Sat Flow, veh/h	366	825	383	831	801	1415	1594	1254	347	1594	1554	101
Grp Volume(v), veh/h	374	0	0	436	0	104	122	0	853	330	0	687
Grp Sat Flow(s),veh/h/ln	1574	0	0	1632	0	1415	1594	0	1601	1594	0	1655
Q Serve(g_s), s	22.8	0.0	0.0	30.8	0.0	9.5	11.4	0.0	51.8	21.3	0.0	61.2
Cycle Q Clear(g_c), s	22.8	0.0	0.0	30.8	0.0	9.5	11.4	0.0	51.8	21.3	0.0	61.2
Prop In Lane	0.23		0.24	0.51		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	239	0	0	335	0	290	126	0	553	226	0	675
V/C Ratio(X)	1.56	0.00	0.00	1.30	0.00	0.36	0.96	0.00	1.54	1.46	0.00	1.02
Avail Cap(c_a), veh/h	239	0	0	335	0	290	126	0	553	226	0	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.6	0.0	0.0	59.6	0.0	51.1	68.8	0.0	49.1	64.3	0.0	44.4
Incr Delay (d2), s/veh	273.0	0.0	0.0	155.7	0.0	1.1	68.5	0.0	253.2	228.9	0.0	39.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.0	0.0	0.0	27.0	0.0	3.4	7.0	0.0	58.9	22.9	0.0	31.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	336.6	0.0	0.0	215.3	0.0	52.2	137.4	0.0	302.3	293.3	0.0	83.5
LnGrp LOS	F	A	A	F	A	D	F	A	F	F	A	F
Approach Vol, veh/h		374			540			975			1017	
Approach Delay, s/veh		336.6			183.9			281.7			151.5	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.6	67.4		29.0	26.0	58.0		37.0
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2
Max Green Setting (Gmax), s	* 12	61.2		22.8	* 21	51.8		30.8
Max Q Clear Time (g_c+I1), s	13.4	63.2		24.8	23.3	53.8		32.8
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		225.0
HCM 6th LOS		F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	11	88	74	5	36	79	724	23	6	691	176
Future Volume (veh/h)	111	11	88	74	5	36	79	724	23	6	691	176
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	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			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	111	11	2	74	5	25	79	724	17	6	691	164
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	137	25	155	23	116	134	1041	862	24	720	171
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.08	0.62	0.62	0.02	0.55	0.55
Sat Flow, veh/h	1594	1378	251	1594	238	1188	1594	1673	1386	1594	1301	309
Grp Volume(v), veh/h	111	0	13	74	0	30	79	724	17	6	0	855
Grp Sat Flow(s),veh/h/ln	1594	0	1628	1594	0	1426	1594	1673	1386	1594	0	1610
Q Serve(g_s), s	7.3	0.0	0.8	4.7	0.0	2.1	5.2	31.1	0.5	0.4	0.0	54.6
Cycle Q Clear(g_c), s	7.3	0.0	0.8	4.7	0.0	2.1	5.2	31.1	0.5	0.4	0.0	54.6
Prop In Lane	1.00		0.15	1.00		0.83	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	158	0	162	155	0	139	134	1041	862	24	0	891
V/C Ratio(X)	0.70	0.00	0.08	0.48	0.00	0.22	0.59	0.70	0.02	0.25	0.00	0.96
Avail Cap(c_a), veh/h	164	0	167	281	0	251	151	1041	862	148	0	922
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.0	0.0	44.1	46.1	0.0	44.9	47.7	13.6	7.8	52.5	0.0	23.0
Incr Delay (d2), s/veh	10.0	0.0	0.1	0.8	0.0	0.3	2.4	2.2	0.0	1.9	0.0	20.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.3	1.9	0.0	0.8	2.1	10.5	0.1	0.2	0.0	23.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.1	0.0	44.2	47.0	0.0	45.2	50.0	15.8	7.8	54.5	0.0	43.3
LnGrp LOS	E	A	D	D	A	D	D	B	A	D	A	D
Approach Vol, veh/h		124			104			820			861	
Approach Delay, s/veh		55.7			46.4			19.0			43.4	
Approach LOS		E			D			B			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.8	65.5		14.2	5.3	73.0		15.4
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7
Max Green Setting (Gmax), s	10.2	61.8		19.0	10.0	62.0		11.1
Max Q Clear Time (g_c+I1), s	7.2	56.6		6.7	2.4	33.1		9.3
Green Ext Time (p_c), s	0.0	3.2		0.1	0.0	7.6		0.0

Intersection Summary		
HCM 6th Ctrl Delay		33.9
HCM 6th LOS		C

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	22	105	32	14	16	87	689	34	19	822	59
Future Volume (veh/h)	84	22	105	32	14	16	87	689	34	19	822	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.98		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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	84	22	28	32	14	-9	87	689	0	19	822	-6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	249	56	220	319	142	0	131	951	806	54	870	737
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.00	0.08	0.57	0.00	0.03	0.52	0.00
Sat Flow, veh/h	1088	350	1383	716	364	-211	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	106	0	28	0	0	0	87	689	0	19	822	-6
Grp Sat Flow(s),veh/h/ln	1438	0	1383	0	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	5.1	0.0	1.5	0.0	0.0	0.0	4.5	25.6	0.0	1.0	39.2	0.0
Cycle Q Clear(g_c), s	5.6	0.0	1.5	0.0	0.0	0.0	4.5	25.6	0.0	1.0	39.2	0.0
Prop In Lane	0.79		1.00	0.86		-0.24	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	305	0	220	0	0	0	131	951	806	54	870	737
V/C Ratio(X)	0.35	0.00	0.13	0.00	0.00	0.00	0.66	0.72	0.00	0.35	0.94	-0.01
Avail Cap(c_a), veh/h	517	0	425	0	0	0	151	951	806	151	906	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.2	0.0	30.5	0.0	0.0	0.0	37.7	13.4	0.0	39.9	19.2	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.1	0.0	0.0	0.0	5.8	3.0	0.0	1.4	17.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.5	0.0	0.0	0.0	1.9	9.0	0.0	0.4	17.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.5	0.0	30.6	0.0	0.0	0.0	43.5	16.4	0.0	41.4	37.1	0.0
LnGrp LOS	C	A	C	A	A	A	D	B	A	D	D	A
Approach Vol, veh/h		134			0			776			835	
Approach Delay, s/veh		32.1			0.0			19.5			37.5	
Approach LOS		C						B			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.7	52.8		21.2	6.6	56.9		21.2				
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7				
Max Green Setting (Gmax), s	8.0	45.8		* 26	8.0	45.8		* 26				
Max Q Clear Time (g_c+I1), s	6.5	41.2		0.0	3.0	27.6		7.6				
Green Ext Time (p_c), s	0.0	2.8		0.0	0.0	6.2		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			29.0									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln

09/14/2023

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	83	162	190	847	830	167
Future Vol, veh/h	83	162	190	847	830	167
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	250	150	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	83	162	190	847	830	167

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2065	838	834	0	-	0
Stage 1	834	-	-	-	-	-
Stage 2	1231	-	-	-	-	-
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	~ 60	366	799	-	-	0
Stage 1	426	-	-	-	-	0
Stage 2	276	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 45	364	796	-	-	-
Mov Cap-2 Maneuver	156	-	-	-	-	-
Stage 1	323	-	-	-	-	-
Stage 2	275	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	32.5		2		0	
HCM LOS	D					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	796	-	156	364	-
HCM Lane V/C Ratio	0.239	-	0.532	0.445	-
HCM Control Delay (s)	10.9	-	51.7	22.6	-
HCM Lane LOS	B	-	F	C	-
HCM 95th %tile Q(veh)	0.9	-	2.6	2.2	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th TWSC
5: Murphy Ave & Healdsburg Ave 08/25/2023

Intersection						
Int Delay, s/veh	1.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	964	39	53	999	35	62
Future Vol, veh/h	964	39	53	999	35	62
Conflicting Peds, #/hr	0	27	19	0	27	19
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	964	39	53	999	35	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1030	0	2143	1030
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	1132	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	674	-	54	283
Stage 1	-	-	-	-	352	-
Stage 2	-	-	-	-	308	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	659	-	48	272
Mov Cap-2 Maneuver	-	-	-	-	162	-
Stage 1	-	-	-	-	344	-
Stage 2	-	-	-	-	277	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	34.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	218	-	-	659	-
HCM Lane V/C Ratio	0.445	-	-	0.08	-
HCM Control Delay (s)	34.1	-	-	10.9	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.1	-	-	0.3	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St 08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	847	0	0	898	120	0	109	0	183	0	136
Future Volume (veh/h)	94	847	0	0	898	120	0	109	0	183	0	136
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	94	847	0	0	898	14	0	109	0	183	0	-8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0	2	0	2
Cap, veh/h	99	1031	0	0	874	725	0	299	0	184	0	0
Arrive On Green	0.06	0.62	0.00	0.00	0.52	0.52	0.00	0.18	0.00	0.12	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1388	0	1673	0	1594	183	
Grp Volume(v), veh/h	94	847	0	0	898	14	0	109	0	183	130.4	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1388	0	1673	0	1594	F	
Q Serve(g_s), s	8.8	58.9	0.0	0.0	78.2	0.7	0.0	8.6	0.0	17.2		
Cycle Q Clear(g_c), s	8.8	58.9	0.0	0.0	78.2	0.7	0.0	8.6	0.0	17.2		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	99	1031	0	0	874	725	0	299	0	184		
V/C Ratio(X)	0.95	0.82	0.00	0.00	1.03	0.02	0.00	0.37	0.00	0.99		
Avail Cap(c_a), veh/h	99	1031	0	0	874	725	0	302	0	184		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	70.0	22.4	0.0	0.0	35.8	17.3	0.0	54.0	0.0	66.1		
Incr Delay (d2), s/veh	73.3	5.4	0.0	0.0	37.6	0.0	0.0	1.6	0.0	64.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.6	24.0	0.0	0.0	40.6	0.2	0.0	3.8	0.0	10.3		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	143.3	27.8	0.0	0.0	73.4	17.3	0.0	55.6	0.0	130.4		
LnGrp LOS	F	C	A	A	F	B	A	E	A	F		
Approach Vol, veh/h		941			912			109				
Approach Delay, s/veh		39.3			72.5			55.6				
Approach LOS		D			E			E				

Timer - Assigned Phs		2			5	6	7	8
Phs Duration (G+Y+Rc), s		98.0			14.0	84.0	22.0	29.7
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0
Max Green Setting (Gmax), s		92.2			* 9.3	78.2	* 17	27.0
Max Q Clear Time (g_c+I1), s		60.9			10.8	80.2	19.2	10.6
Green Ext Time (p_c), s		7.6			0.0	0.0	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	62.0
HCM 6th LOS	E

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	196	104	222	214	302	122	668	191	330	645	46
Future Volume (veh/h)	87	196	104	222	214	302	122	668	191	330	645	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	87	196	91	222	214	104	122	668	185	330	645	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	154	71	190	328	515	141	526	146	267	774	50
Arrive On Green	0.07	0.14	0.14	0.12	0.20	0.20	0.09	0.42	0.42	0.17	0.50	0.50
Sat Flow, veh/h	1594	1070	497	1594	1673	1415	1594	1254	347	1594	1554	101
Grp Volume(v), veh/h	87	0	287	222	214	104	122	0	853	330	0	687
Grp Sat Flow(s),veh/h/ln	1594	0	1567	1594	1673	1415	1594	0	1601	1594	0	1655
Q Serve(g_s), s	7.8	0.0	20.8	17.3	17.1	7.3	11.0	0.0	60.8	24.3	0.0	51.6
Cycle Q Clear(g_c), s	7.8	0.0	20.8	17.3	17.1	7.3	11.0	0.0	60.8	24.3	0.0	51.6
Prop In Lane	1.00		0.32	1.00		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	107	0	225	190	328	515	141	0	671	267	0	825
V/C Ratio(X)	0.82	0.00	1.28	1.17	0.65	0.20	0.86	0.00	1.27	1.24	0.00	0.83
Avail Cap(c_a), veh/h	137	0	225	190	328	515	148	0	671	267	0	825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.8	0.0	62.1	63.8	53.8	31.7	65.2	0.0	42.1	60.3	0.0	31.2
Incr Delay (d2), s/veh	19.7	0.0	154.3	117.6	5.2	0.3	34.5	0.0	133.2	133.9	0.0	7.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	17.7	13.1	7.6	2.5	5.7	0.0	47.7	19.6	0.0	21.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.5	0.0	216.4	181.5	58.9	32.0	99.7	0.0	175.3	194.3	0.0	38.8
LnGrp LOS	F	A	F	F	E	C	F	A	F	F	A	D
Approach Vol, veh/h		374			540			975			1017	
Approach Delay, s/veh		186.1			104.1			165.9			89.3	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.6	78.4	22.0	27.0	29.0	67.0	14.4	34.6
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 14	71.6	* 17	20.8	* 24	60.8	* 13	25.6
Max Q Clear Time (g_c+I1), s	13.0	53.6	19.3	22.8	26.3	62.8	9.8	19.1
Green Ext Time (p_c), s	0.0	5.8	0.0	0.0	0.0	0.0	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	130.2
HCM 6th LOS	F

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	196	104	222	214	302	122	668	191	330	645	46
Future Volume (veh/h)	87	196	104	222	214	302	122	668	191	330	645	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	87	196	91	222	214	104	122	668	185	330	645	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	193	158	190	280	484	142	553	153	278	818	53
Arrive On Green	0.07	0.12	0.12	0.12	0.17	0.17	0.09	0.44	0.44	0.17	0.53	0.53
Sat Flow, veh/h	1594	1673	1376	1594	1673	1414	1594	1254	347	1594	1554	101
Grp Volume(v), veh/h	87	196	91	222	214	104	122	0	853	330	0	687
Grp Sat Flow(s),veh/h/ln	1594	1673	1376	1594	1673	1414	1594	0	1601	1594	0	1655
Q Serve(g_s), s	7.8	16.7	9.1	17.3	17.7	7.6	11.0	0.0	63.9	25.3	0.0	48.7
Cycle Q Clear(g_c), s	7.8	16.7	9.1	17.3	17.7	7.6	11.0	0.0	63.9	25.3	0.0	48.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	107	193	158	190	280	484	142	0	706	278	0	871
V/C Ratio(X)	0.82	1.02	0.57	1.17	0.76	0.21	0.86	0.00	1.21	1.19	0.00	0.79
Avail Cap(c_a), veh/h	110	193	158	190	280	484	170	0	706	278	0	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.8	64.2	60.8	63.8	57.6	33.9	65.2	0.0	40.6	59.8	0.0	27.8
Incr Delay (d2), s/veh	33.0	69.3	6.1	117.6	12.4	0.3	26.5	0.0	106.9	114.3	0.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	10.6	3.4	13.1	8.4	2.6	5.4	0.0	44.9	18.8	0.0	19.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.8	133.4	66.9	181.5	70.0	34.2	91.6	0.0	147.5	174.1	0.0	33.0
LnGrp LOS	F	F	E	F	E	C	F	A	F	F	A	C
Approach Vol, veh/h		374			540			975			1017	
Approach Delay, s/veh		109.4			109.0			140.5			78.8	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.6	82.5	22.0	22.9	30.0	70.1	14.4	30.5
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 16	73.7	* 17	16.7	* 25	63.9	* 10	24.0
Max Q Clear Time (g_c+I1), s	13.0	50.7	19.3	18.7	27.3	65.9	9.8	19.7
Green Ext Time (p_c), s	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	109.0
HCM 6th LOS	F

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Intersection				
Intersection Delay, s/veh	176.1			
Intersection LOS	F			

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	387	738	981	1021
Demand Flow Rate, veh/h	395	752	1000	1042
Vehicles Circulating, veh/h	1221	894	626	568
Vehicles Exiting, veh/h	389	732	990	1078
Ped Vol Crossing Leg, #/h	1	2	0	1
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	77.3	194.1	194.4	183.0
Approach LOS	F	F	F	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	395	752	1000	1042
Cap Entry Lane, veh/h	397	554	729	773
Entry HV Adj Factor	0.980	0.981	0.981	0.980
Flow Entry, veh/h	387	738	981	1021
Cap Entry, veh/h	389	544	715	758
V/C Ratio	0.994	1.356	1.372	1.348
Control Delay, s/veh	77.3	194.1	194.4	183.0
LOS	F	F	F	F
95th %tile Queue, veh	12	33	42	42

HCM 6th Roundabout
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln 08/29/2023

Intersection			
Intersection Delay, s/veh	22.6		
Intersection LOS	C		

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	245	1037	997
Demand Flow Rate, veh/h	250	1058	1017
Vehicles Circulating, veh/h	847	85	194
Vehicles Exiting, veh/h	364	1012	949
Ped Vol Crossing Leg, #/h	4	4	4
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	13.2	19.8	27.8
Approach LOS	B	C	D

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	250	1058	1017
Cap Entry Lane, veh/h	582	1265	1132
Entry HV Adj Factor	0.980	0.980	0.981
Flow Entry, veh/h	245	1037	997
Cap Entry, veh/h	570	1240	1110
V/C Ratio	0.430	0.837	0.899
Control Delay, s/veh	13.2	19.8	27.8
LOS	B	C	D
95th %tile Queue, veh	2	11	14

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	158	57	113	123	260	48	427	100	221	489	41
Future Volume (veh/h)	50	158	57	113	123	260	48	427	100	221	489	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	184	56	131	143	0	56	497	107	257	569	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	62	198	60	140	153	254	104	398	86	238	585	46
Arrive On Green	0.20	0.20	0.20	0.18	0.18	0.00	0.07	0.30	0.30	0.15	0.38	0.38
Sat Flow, veh/h	312	990	301	781	853	1418	1594	1334	287	1594	1531	121
Grp Volume(v), veh/h	298	0	0	274	0	0	56	0	604	257	0	614
Grp Sat Flow(s),veh/h/ln	1604	0	0	1634	0	1418	1594	0	1621	1594	0	1652
Q Serve(g_s), s	24.5	0.0	0.0	22.2	0.0	0.0	4.6	0.0	40.0	20.0	0.0	49.0
Cycle Q Clear(g_c), s	24.5	0.0	0.0	22.2	0.0	0.0	4.6	0.0	40.0	20.0	0.0	49.0
Prop In Lane	0.19		0.19	0.48		1.00	1.00		0.18	1.00		0.07
Lane Grp Cap(c), veh/h	320	0	0	293	0	254	104	0	483	238	0	631
V/C Ratio(X)	0.93	0.00	0.00	0.94	0.00	0.00	0.54	0.00	1.25	1.08	0.00	0.97
Avail Cap(c_a), veh/h	335	0	0	293	0	254	190	0	483	238	0	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	0.0	0.0	54.3	0.0	0.0	60.7	0.0	47.0	57.0	0.0	40.7
Incr Delay (d2), s/veh	31.6	0.0	0.0	36.4	0.0	0.0	1.6	0.0	128.5	81.6	0.0	29.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	0.0	0.0	11.9	0.0	0.0	1.9	0.0	32.8	13.2	0.0	24.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.3	0.0	0.0	90.7	0.0	0.0	62.3	0.0	175.6	138.7	0.0	69.8
LnGrp LOS	F	A	A	F	A	A	E	A	F	F	A	E
Approach Vol, veh/h		298			274			660			871	
Approach Delay, s/veh		84.3			90.7			166.0			90.1	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.5	57.4		33.0	24.7	46.2		30.2				
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2				
Max Green Setting (Gmax), s	* 16	40.0		28.0	* 20	40.0		24.0				
Max Q Clear Time (g_c+I1), s	6.6	51.0		26.5	22.0	42.0		24.2				
Green Ext Time (p_c), s	0.0	0.0		0.3	0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			113.2									
HCM 6th LOS			F									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	53	70	83	36	53	44	396	71	50	479	137
Future Volume (veh/h)	151	53	70	83	36	53	44	396	71	50	479	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	178	62	21	98	42	7	52	466	5	59	564	143
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	158	54	205	179	30	130	749	631	138	583	148
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.08	0.45	0.45	0.09	0.45	0.45
Sat Flow, veh/h	1594	1187	402	1594	1393	232	1594	1673	1409	1594	1287	326
Grp Volume(v), veh/h	178	0	83	98	0	49	52	466	5	59	0	707
Grp Sat Flow(s),veh/h/ln	1594	0	1589	1594	0	1625	1594	1673	1409	1594	0	1613
Q Serve(g_s), s	9.6	0.0	4.2	5.0	0.0	2.4	2.7	18.7	0.2	3.1	0.0	37.5
Cycle Q Clear(g_c), s	9.6	0.0	4.2	5.0	0.0	2.4	2.7	18.7	0.2	3.1	0.0	37.5
Prop In Lane	1.00		0.25	1.00		0.14	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	213	0	212	205	0	209	130	749	631	138	0	730
V/C Ratio(X)	0.84	0.00	0.39	0.48	0.00	0.23	0.40	0.62	0.01	0.43	0.00	0.97
Avail Cap(c_a), veh/h	272	0	271	344	0	351	272	761	641	272	0	734
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.2	0.0	34.8	35.6	0.0	34.4	38.3	18.6	13.5	38.1	0.0	23.4
Incr Delay (d2), s/veh	13.4	0.0	0.4	0.6	0.0	0.2	0.7	1.8	0.0	0.8	0.0	25.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	1.6	2.0	0.0	1.0	1.0	6.8	0.1	1.2	0.0	17.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.5	0.0	35.3	36.2	0.0	34.6	39.0	20.4	13.5	38.8	0.0	48.9
LnGrp LOS	D	A	D	D	A	C	D	C	B	D	A	D
Approach Vol, veh/h		261			147			523			766	
Approach Delay, s/veh		45.7			35.7			22.2			48.2	
Approach LOS		D			D			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.9	45.6		15.0	11.3	45.2		16.4				
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7				
Max Green Setting (Gmax), s	15.0	40.0		19.0	15.0	40.0		15.0				
Max Q Clear Time (g_c+I1), s	4.7	39.5		7.0	5.1	20.7		11.6				
Green Ext Time (p_c), s	0.0	0.3		0.2	0.0	3.6		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			38.7									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	12	35	70	7	43	34	425	40	24	552	43
Future Volume (veh/h)	32	12	35	70	7	43	34	425	40	24	552	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	36	14	0	80	8	12	39	483	0	27	627	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	279	90	250	300	31	30	101	739	627	77	714	605
Arrive On Green	0.18	0.18	0.00	0.18	0.18	0.18	0.06	0.44	0.00	0.05	0.43	0.00
Sat Flow, veh/h	1001	511	1418	1093	177	173	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	50	0	0	100	0	0	39	483	0	27	627	0
Grp Sat Flow(s),veh/h/ln	1512	0	1418	1443	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	0.0	0.0	0.0	2.0	0.0	0.0	1.4	13.7	0.0	1.0	20.8	0.0
Cycle Q Clear(g_c), s	1.6	0.0	0.0	3.6	0.0	0.0	1.4	13.7	0.0	1.0	20.8	0.0
Prop In Lane	0.72		1.00	0.80		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	369	0	250	361	0	0	101	739	627	77	714	605
V/C Ratio(X)	0.14	0.00	0.00	0.28	0.00	0.00	0.38	0.65	0.00	0.35	0.88	0.00
Avail Cap(c_a), veh/h	738	0	609	720	0	0	290	830	703	290	830	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.2	0.0	0.0	22.0	0.0	0.0	27.2	13.2	0.0	27.9	15.9	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.2	0.0	0.0	0.9	1.9	0.0	1.0	10.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	1.2	0.0	0.0	0.5	4.6	0.0	0.4	8.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	0.0	0.0	22.1	0.0	0.0	28.1	15.2	0.0	28.9	26.1	0.0
LnGrp LOS	C	A	A	C	A	A	C	B	A	C	C	A
Approach Vol, veh/h		50			100			522			654	
Approach Delay, s/veh		21.2			22.1			16.1			26.2	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	34.6		18.4	6.6	35.5		18.4
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7
Max Green Setting (Gmax), s	11.0	30.0		* 26	11.0	30.0		* 26
Max Q Clear Time (g_c+I1), s	3.4	22.8		5.6	3.0	15.7		3.6
Green Ext Time (p_c), s	0.0	3.0		0.3	0.0	3.5		0.1

Intersection Summary	
HCM 6th Ctrl Delay	21.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln

08/22/2023

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	84	208	139	436	554	115
Future Vol, veh/h	84	208	139	436	554	115
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	250	150	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	239	160	501	637	132

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1466	645	641	0	-	0
Stage 1	641	-	-	-	-	-
Stage 2	825	-	-	-	-	-
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	141	472	943	-	-	0
Stage 1	525	-	-	-	-	0
Stage 2	430	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	116	469	940	-	-	-
Mov Cap-2 Maneuver	250	-	-	-	-	-
Stage 1	435	-	-	-	-	-
Stage 2	429	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.6	2.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	940	-	250	469	-
HCM Lane V/C Ratio	0.17	-	0.386	0.51	-
HCM Control Delay (s)	9.6	-	28.2	20.4	-
HCM Lane LOS	A	-	D	C	-
HCM 95th %tile Q(veh)	0.6	-	1.7	2.8	-

HCM 6th TWSC
5: Murphy Ave & Healdsburg Ave 08/22/2023

Intersection						
Int Delay, s/veh	1.7					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	715	52	18	552	37	60
Future Vol, veh/h	715	52	18	552	37	60
Conflicting Peds, #/hr	0	19	13	0	19	13
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	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	813	59	20	627	42	68

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	891	0	1548	875
Stage 1	-	-	-	-	862	-
Stage 2	-	-	-	-	686	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	761	-	126	349
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	500	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	749	-	119	340
Mov Cap-2 Maneuver	-	-	-	-	255	-
Stage 1	-	-	-	-	407	-
Stage 2	-	-	-	-	479	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		0.3		23.6	
HCM LOS					C	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	302	-	-	749	-
HCM Lane V/C Ratio	0.365	-	-	0.027	-
HCM Control Delay (s)	23.6	-	-	9.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.6	-	-	0.1	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St 08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	566	0	0	413	135	0	189	0	166	0	130
Future Volume (veh/h)	154	566	0	0	413	135	0	189	0	166	0	130
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	173	636	0	0	464	0	0	212	0	187	0	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0	2	0	2
Cap, veh/h	201	779	0	0	491	416	0	445	0	215	0	0
Arrive On Green	0.13	0.47	0.00	0.00	0.29	0.00	0.00	0.27	0.00	0.14	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1418	0	1673	0	1594	187	
Grp Volume(v), veh/h	173	636	0	0	464	0	0	212	0	187	59.1	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1418	0	1673	0	1594	E	
Q Serve(g_s), s	10.8	33.2	0.0	0.0	27.4	0.0	0.0	10.8	0.0	11.6		
Cycle Q Clear(g_c), s	10.8	33.2	0.0	0.0	27.4	0.0	0.0	10.8	0.0	11.6		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	201	779	0	0	491	416	0	445	0	215		
V/C Ratio(X)	0.86	0.82	0.00	0.00	0.95	0.00	0.00	0.48	0.00	0.87		
Avail Cap(c_a), veh/h	252	779	0	0	496	420	0	446	0	283		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	43.4	23.3	0.0	0.0	35.0	0.0	0.0	31.2	0.0	42.9		
Incr Delay (d2), s/veh	18.3	6.8	0.0	0.0	27.5	0.0	0.0	1.7	0.0	16.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.2	13.9	0.0	0.0	14.8	0.0	0.0	4.6	0.0	5.6		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.7	30.1	0.0	0.0	62.5	0.0	0.0	32.9	0.0	59.1		
LnGrp LOS	E	C	A	A	E	A	A	C	A	E		
Approach Vol, veh/h		809			464			212				
Approach Delay, s/veh		36.8			62.5			32.9				
Approach LOS		D			E			C				

Timer - Assigned Phs		2			5	6	7	8
Phs Duration (G+Y+Rc), s		52.9			17.4	35.5	18.4	29.9
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0
Max Green Setting (Gmax), s		30.0			* 16	30.0	* 18	27.0
Max Q Clear Time (g_c+I1), s		35.2			12.8	29.4	13.6	12.8
Green Ext Time (p_c), s		0.0			0.1	0.2	0.1	1.8

Intersection Summary			
HCM 6th Ctrl Delay			45.9
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	158	57	113	123	260	48	427	100	221	489	41
Future Volume (veh/h)	50	158	57	113	123	260	48	427	100	221	489	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	184	56	131	143	0	56	497	107	257	569	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	209	64	154	321	509	118	491	106	267	706	56
Arrive On Green	0.08	0.17	0.17	0.10	0.19	0.00	0.07	0.37	0.37	0.17	0.46	0.46
Sat Flow, veh/h	1594	1231	375	1594	1673	1418	1594	1334	287	1594	1531	121
Grp Volume(v), veh/h	58	0	240	131	143	0	56	0	604	257	0	614
Grp Sat Flow(s),veh/h/ln	1594	0	1606	1594	1673	1418	1594	0	1621	1594	0	1652
Q Serve(g_s), s	3.9	0.0	16.1	8.9	8.3	0.0	3.7	0.0	40.7	17.7	0.0	35.2
Cycle Q Clear(g_c), s	3.9	0.0	16.1	8.9	8.3	0.0	3.7	0.0	40.7	17.7	0.0	35.2
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.18	1.00		0.07
Lane Grp Cap(c), veh/h	120	0	273	154	321	509	118	0	597	267	0	762
V/C Ratio(X)	0.48	0.00	0.88	0.85	0.45	0.00	0.47	0.00	1.01	0.96	0.00	0.81
Avail Cap(c_a), veh/h	144	0	339	154	363	545	144	0	597	267	0	762
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.0	0.0	44.7	49.1	39.5	0.0	49.1	0.0	34.9	45.7	0.0	25.5
Incr Delay (d2), s/veh	1.1	0.0	20.6	32.1	1.4	0.0	1.1	0.0	39.8	44.6	0.0	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	7.7	4.9	3.5	0.0	1.5	0.0	21.6	10.0	0.0	14.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.2	0.0	65.4	81.2	40.9	0.0	50.2	0.0	74.7	90.2	0.0	32.1
LnGrp LOS	D	A	E	F	D	A	D	A	F	F	A	C
Approach Vol, veh/h		298			274			660			871	
Approach Delay, s/veh		62.4			60.1			72.6			49.3	
Approach LOS		E			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	57.2	15.4	25.0	23.2	46.9	13.0	27.4
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 10	49.2	* 11	23.3	* 19	40.7	* 10	24.0
Max Q Clear Time (g_c+I1), s	5.7	37.2	10.9	18.1	19.7	42.7	5.9	10.3
Green Ext Time (p_c), s	0.0	4.0	0.0	0.7	0.0	0.0	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	59.9
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	158	57	113	123	260	48	427	100	221	489	41
Future Volume (veh/h)	50	158	57	113	123	260	48	427	100	221	489	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	184	56	131	143	0	56	497	107	257	569	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	124	224	190	156	258	468	122	514	111	280	742	59
Arrive On Green	0.08	0.13	0.13	0.10	0.15	0.00	0.08	0.39	0.39	0.18	0.48	0.48
Sat Flow, veh/h	1594	1673	1418	1594	1673	1418	1594	1334	287	1594	1531	121
Grp Volume(v), veh/h	58	184	56	131	143	0	56	0	604	257	0	614
Grp Sat Flow(s),veh/h/ln	1594	1673	1418	1594	1673	1418	1594	0	1621	1594	0	1652
Q Serve(g_s), s	3.7	11.3	3.7	8.5	8.3	0.0	3.5	0.0	38.4	16.7	0.0	32.1
Cycle Q Clear(g_c), s	3.7	11.3	3.7	8.5	8.3	0.0	3.5	0.0	38.4	16.7	0.0	32.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.07
Lane Grp Cap(c), veh/h	124	224	190	156	258	468	122	0	625	280	0	800
V/C Ratio(X)	0.47	0.82	0.30	0.84	0.55	0.00	0.46	0.00	0.97	0.92	0.00	0.77
Avail Cap(c_a), veh/h	151	331	280	200	382	573	151	0	627	280	0	800
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.5	44.4	41.1	46.7	41.2	0.0	46.5	0.0	31.7	42.6	0.0	22.3
Incr Delay (d2), s/veh	1.0	12.4	1.2	17.7	2.6	0.0	1.0	0.0	27.9	32.4	0.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.2	1.3	4.1	3.5	0.0	1.4	0.0	18.7	8.8	0.0	12.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.5	56.8	42.3	64.3	43.8	0.0	47.5	0.0	59.6	75.0	0.0	27.1
LnGrp LOS	D	E	D	E	D	A	D	A	E	E	A	C
Approach Vol, veh/h		298			274			660			871	
Approach Delay, s/veh		52.2			53.6			58.5			41.2	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.8	57.2	15.0	20.3	23.2	46.8	12.9	22.4
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 10	49.2	* 13	20.8	* 19	40.7	* 10	24.0
Max Q Clear Time (g_c+I1), s	5.5	34.1	10.5	13.3	18.7	40.4	5.7	10.3
Green Ext Time (p_c), s	0.0	4.6	0.0	0.8	0.0	0.1	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	49.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Intersection				
Intersection Delay, s/veh	27.8			
Intersection LOS	D			

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	308	576	669	874
Demand Flow Rate, veh/h	314	588	682	891
Vehicles Circulating, veh/h	976	623	509	337
Vehicles Exiting, veh/h	252	568	781	874
Ped Vol Crossing Leg, #/h	0	2	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	21.1	26.4	26.4	32.3
Approach LOS	C	D	D	D

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	314	588	682	891
Cap Entry Lane, veh/h	510	731	821	979
Entry HV Adj Factor	0.982	0.980	0.981	0.981
Flow Entry, veh/h	308	576	669	874
Cap Entry, veh/h	501	716	805	959
V/C Ratio	0.616	0.805	0.831	0.911
Control Delay, s/veh	21.1	26.4	26.4	32.3
LOS	C	D	D	D
95th %tile Queue, veh	4	8	9	14

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	167	99	93	162	198	109	513	84	240	516	46
Future Volume (veh/h)	87	167	99	93	162	198	109	513	84	240	516	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	92	176	90	98	171	0	115	540	82	253	543	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	84	160	82	106	184	250	136	419	64	236	548	44
Arrive On Green	0.21	0.21	0.21	0.18	0.18	0.00	0.09	0.30	0.30	0.15	0.36	0.36
Sat Flow, veh/h	403	772	395	599	1045	1418	1594	1414	215	1594	1527	124
Grp Volume(v), veh/h	358	0	0	269	0	0	115	0	622	253	0	587
Grp Sat Flow(s),veh/h/ln	1570	0	0	1644	0	1418	1594	0	1628	1594	0	1651
Q Serve(g_s), s	28.0	0.0	0.0	21.8	0.0	0.0	9.6	0.0	40.0	20.0	0.0	47.8
Cycle Q Clear(g_c), s	28.0	0.0	0.0	21.8	0.0	0.0	9.6	0.0	40.0	20.0	0.0	47.8
Prop In Lane	0.26		0.25	0.36		1.00	1.00		0.13	1.00		0.07
Lane Grp Cap(c), veh/h	325	0	0	290	0	250	136	0	482	236	0	593
V/C Ratio(X)	1.10	0.00	0.00	0.93	0.00	0.00	0.85	0.00	1.29	1.07	0.00	0.99
Avail Cap(c_a), veh/h	325	0	0	292	0	252	189	0	482	236	0	593
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.6	0.0	0.0	54.8	0.0	0.0	60.9	0.0	47.6	57.6	0.0	43.1
Incr Delay (d2), s/veh	79.6	0.0	0.0	34.6	0.0	0.0	16.7	0.0	145.5	79.2	0.0	34.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.8	0.0	0.0	11.7	0.0	0.0	4.4	0.0	35.1	13.0	0.0	24.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	133.1	0.0	0.0	89.4	0.0	0.0	77.6	0.0	193.1	136.7	0.0	77.6
LnGrp LOS	F	A	A	F	A	A	E	A	F	F	A	E
Approach Vol, veh/h		358			269			737			840	
Approach Delay, s/veh		133.1			89.4			175.1			95.4	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.2	54.7		34.2	24.7	46.2		30.0
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2
Max Green Setting (Gmax), s	* 16	40.0		28.0	* 20	40.0		24.0
Max Q Clear Time (g_c+I1), s	11.6	49.8		30.0	22.0	42.0		23.8
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	127.4
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd 08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	12	87	25	5	15	59	485	16	10	610	132
Future Volume (veh/h)	165	12	87	25	5	15	59	485	16	10	610	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	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			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	168	12	1	26	5	4	60	495	10	10	622	123
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	212	203	17	118	63	50	145	917	759	40	651	129
Arrive On Green	0.13	0.13	0.13	0.07	0.07	0.07	0.09	0.55	0.55	0.02	0.48	0.48
Sat Flow, veh/h	1594	1524	127	1594	851	681	1594	1673	1386	1594	1351	267
Grp Volume(v), veh/h	168	0	13	26	0	9	60	495	10	10	0	745
Grp Sat Flow(s),veh/h/ln	1594	0	1651	1594	0	1532	1594	1673	1386	1594	0	1619
Q Serve(g_s), s	8.3	0.0	0.6	1.2	0.0	0.4	2.9	15.4	0.3	0.5	0.0	35.9
Cycle Q Clear(g_c), s	8.3	0.0	0.6	1.2	0.0	0.4	2.9	15.4	0.3	0.5	0.0	35.9
Prop In Lane	1.00		0.08	1.00		0.44	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	212	0	220	118	0	113	145	917	759	40	0	779
V/C Ratio(X)	0.79	0.00	0.06	0.22	0.00	0.08	0.41	0.54	0.01	0.25	0.00	0.96
Avail Cap(c_a), veh/h	294	0	305	373	0	358	294	917	759	294	0	797
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.1	0.0	30.8	35.4	0.0	35.1	34.9	11.8	8.4	38.9	0.0	20.2
Incr Delay (d2), s/veh	6.4	0.0	0.0	0.3	0.0	0.1	0.7	0.8	0.0	1.2	0.0	21.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	0.2	0.5	0.0	0.2	1.1	4.9	0.1	0.2	0.0	16.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.5	0.0	30.8	35.8	0.0	35.2	35.6	12.6	8.4	40.1	0.0	42.0
LnGrp LOS	D	A	C	D	A	D	D	B	A	D	A	D
Approach Vol, veh/h		181			35			565			755	
Approach Delay, s/veh		39.8			35.6			15.0			42.0	
Approach LOS		D			D			B			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.1	44.9		9.7	5.7	50.3		15.5
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7
Max Green Setting (Gmax), s	15.0	40.0		19.0	15.0	40.0		15.0
Max Q Clear Time (g_c+I1), s	4.9	37.9		3.2	2.5	17.4		10.3
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	4.2		0.1

Intersection Summary	
HCM 6th Ctrl Delay	31.6
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave 08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	6	77	45	14	25	66	506	34	19	612	65
Future Volume (veh/h)	68	6	77	45	14	25	66	506	34	19	612	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		1.00	0.98		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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	70	6	0	46	14	0	68	522	0	20	631	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	347	25	266	298	77	0	138	781	662	59	698	592
Arrive On Green	0.19	0.19	0.00	0.19	0.19	0.00	0.09	0.47	0.00	0.04	0.42	0.00
Sat Flow, veh/h	1290	134	1418	1070	409	0	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	76	0	0	60	0	0	68	522	0	20	631	0
Grp Sat Flow(s),veh/h/ln	1424	0	1418	1479	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	0.7	0.0	0.0	0.0	0.0	0.0	2.7	15.8	0.0	0.8	23.1	0.0
Cycle Q Clear(g_c), s	2.8	0.0	0.0	2.1	0.0	0.0	2.7	15.8	0.0	0.8	23.1	0.0
Prop In Lane	0.92		1.00	0.77		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	372	0	266	374	0	0	138	781	662	59	698	592
V/C Ratio(X)	0.20	0.00	0.00	0.16	0.00	0.00	0.49	0.67	0.00	0.34	0.90	0.00
Avail Cap(c_a), veh/h	665	0	563	677	0	0	268	781	662	268	767	650
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.7	0.0	0.0	22.4	0.0	0.0	28.5	13.5	0.0	30.7	17.8	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	0.0	1.0	2.5	0.0	1.2	13.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.7	0.0	0.0	1.0	5.5	0.0	0.3	10.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	0.0	0.0	22.5	0.0	0.0	29.5	16.0	0.0	32.0	31.7	0.0
LnGrp LOS	C	A	A	C	A	A	C	B	A	C	C	A
Approach Vol, veh/h		76			60			590			651	
Approach Delay, s/veh		22.8			22.5			17.6			31.7	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.4	36.1		20.0	6.1	39.4		20.0
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7
Max Green Setting (Gmax), s	11.0	30.0		* 26	11.0	30.0		* 26
Max Q Clear Time (g_c+I1), s	4.7	25.1		4.1	2.8	17.8		4.8
Green Ext Time (p_c), s	0.0	2.2		0.1	0.0	3.5		0.2

Intersection Summary	
HCM 6th Ctrl Delay	24.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	5.1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	81	199	203	571	607	133
Future Vol, veh/h	81	199	203	571	607	133
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	250	150	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	84	207	211	595	632	139

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1657	640	636	0	-	0
Stage 1	636	-	-	-	-	-
Stage 2	1021	-	-	-	-	-
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	108	475	947	-	-	0
Stage 1	527	-	-	-	-	0
Stage 2	348	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 83	472	944	-	-	-
Mov Cap-2 Maneuver	209	-	-	-	-	-
Stage 1	408	-	-	-	-	-
Stage 2	347	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.8	2.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	944	-	209	472	-
HCM Lane V/C Ratio	0.224	-	0.404	0.439	-
HCM Control Delay (s)	9.9	-	33.4	18.5	-
HCM Lane LOS	A	-	D	C	-
HCM 95th %tile Q(veh)	0.9	-	1.8	2.2	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	0.9					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	739	66	25	768	22	41
Future Vol, veh/h	739	66	25	768	22	41
Conflicting Peds, #/hr	0	27	19	0	27	19
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	762	68	26	792	23	42

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	857	0	1694	842
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	871	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	783	-	102	364
Stage 1	-	-	-	-	431	-
Stage 2	-	-	-	-	410	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	765	-	94	350
Mov Cap-2 Maneuver	-	-	-	-	227	-
Stage 1	-	-	-	-	422	-
Stage 2	-	-	-	-	387	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	20.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	294	-	-	765	-
HCM Lane V/C Ratio	0.221	-	-	0.034	-
HCM Control Delay (s)	20.7	-	-	9.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St

08/22/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	573	0	0	567	116	0	109	0	166	0	147
Future Volume (veh/h)	123	573	0	0	567	116	0	109	0	166	0	147
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	127	591	0	0	585	11	0	112	0	171	0	4
Peak Hour Factor	0.97	0.97	0.97	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	0	2	0	2	0	2
Cap, veh/h	154	773	0	0	529	438	0	451	0	201	0	0
Arrive On Green	0.10	0.46	0.00	0.00	0.32	0.32	0.00	0.27	0.00	0.13	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1387	0	1673	0	1594	171	
Grp Volume(v), veh/h	127	591	0	0	585	11	0	112	0	171	49.7	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1387	0	1673	0	1594	D	
Q Serve(g_s), s	7.4	27.9	0.0	0.0	30.0	0.5	0.0	5.0	0.0	10.0		
Cycle Q Clear(g_c), s	7.4	27.9	0.0	0.0	30.0	0.5	0.0	5.0	0.0	10.0		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	154	773	0	0	529	438	0	451	0	201		
V/C Ratio(X)	0.82	0.76	0.00	0.00	1.11	0.03	0.00	0.25	0.00	0.85		
Avail Cap(c_a), veh/h	269	773	0	0	529	438	0	476	0	302		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	42.1	21.2	0.0	0.0	32.5	22.4	0.0	27.1	0.0	40.6		
Incr Delay (d2), s/veh	4.2	4.6	0.0	0.0	71.4	0.0	0.0	0.6	0.0	9.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.1	11.3	0.0	0.0	22.4	0.2	0.0	2.0	0.0	4.4		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	25.8	0.0	0.0	103.9	22.4	0.0	27.7	0.0	49.7		
LnGrp LOS	D	C	A	A	F	C	A	C	A	D		
Approach Vol, veh/h		718			596			112				
Approach Delay, s/veh		29.4			102.4			27.7				
Approach LOS		C			F			C				

Timer - Assigned Phs		2			5	6	7	8				
Phs Duration (G+Y+Rc), s		49.7			13.9	35.8	16.7	28.6				
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0				
Max Green Setting (Gmax), s		30.0			* 16	30.0	* 18	27.0				
Max Q Clear Time (g_c+I1), s		29.9			9.4	32.0	12.0	7.0				
Green Ext Time (p_c), s		0.1			0.1	0.0	0.1	0.9				

Intersection Summary			
HCM 6th Ctrl Delay			58.7
HCM 6th LOS			E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	167	99	93	162	198	109	513	84	240	516	46
Future Volume (veh/h)	87	167	99	93	162	198	109	513	84	240	516	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	92	176	90	98	171	0	115	540	82	253	543	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	124	192	98	125	311	502	137	553	84	268	723	59
Arrive On Green	0.08	0.19	0.19	0.08	0.19	0.00	0.09	0.39	0.39	0.17	0.47	0.47
Sat Flow, veh/h	1594	1033	528	1594	1673	1418	1594	1414	215	1594	1527	124
Grp Volume(v), veh/h	92	0	266	98	171	0	115	0	622	253	0	587
Grp Sat Flow(s),veh/h/ln	1594	0	1562	1594	1673	1418	1594	0	1629	1594	0	1651
Q Serve(g_s), s	7.0	0.0	20.6	7.4	11.4	0.0	8.8	0.0	46.3	19.3	0.0	35.8
Cycle Q Clear(g_c), s	7.0	0.0	20.6	7.4	11.4	0.0	8.8	0.0	46.3	19.3	0.0	35.8
Prop In Lane	1.00		0.34	1.00		1.00	1.00		0.13	1.00		0.07
Lane Grp Cap(c), veh/h	124	0	290	125	311	502	137	0	637	268	0	782
V/C Ratio(X)	0.74	0.00	0.92	0.78	0.55	0.00	0.84	0.00	0.98	0.94	0.00	0.75
Avail Cap(c_a), veh/h	133	0	304	133	326	515	169	0	637	268	0	782
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	55.6	0.0	49.3	55.8	45.4	0.0	55.5	0.0	36.9	50.7	0.0	26.5
Incr Delay (d2), s/veh	15.9	0.0	31.2	22.0	2.4	0.0	21.8	0.0	29.7	39.7	0.0	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	10.2	3.7	4.9	0.0	4.3	0.0	22.6	10.4	0.0	14.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.5	0.0	80.5	77.8	47.8	0.0	77.2	0.0	66.6	90.4	0.0	30.9
LnGrp LOS	E	A	F	E	D	A	E	A	E	F	A	C
Approach Vol, veh/h		358			269			737			840	
Approach Delay, s/veh		78.2			58.7			68.3			48.8	
Approach LOS		E			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.3	64.5	14.4	29.0	25.4	54.4	14.3	29.1
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 13	55.8	* 10	24.0	* 21	48.2	* 10	24.0
Max Q Clear Time (g_c+I1), s	10.8	37.8	9.4	22.6	21.3	48.3	9.0	13.4
Green Ext Time (p_c), s	0.0	4.7	0.0	0.2	0.0	0.0	0.0	0.8

Intersection Summary			
HCM 6th Ctrl Delay			61.3
HCM 6th LOS			E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	167	99	93	162	198	109	513	84	240	516	46
Future Volume (veh/h)	87	167	99	93	162	198	109	513	84	240	516	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	92	176	90	98	171	0	115	540	82	253	543	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	219	180	139	220	434	142	577	88	278	754	61
Arrive On Green	0.09	0.13	0.13	0.09	0.13	0.00	0.09	0.41	0.41	0.17	0.49	0.49
Sat Flow, veh/h	1594	1673	1378	1594	1673	1418	1594	1414	215	1594	1527	124
Grp Volume(v), veh/h	92	176	90	98	171	0	115	0	622	253	0	587
Grp Sat Flow(s),veh/h/ln	1594	1673	1378	1594	1673	1418	1594	0	1629	1594	0	1651
Q Serve(g_s), s	6.1	11.1	6.6	6.5	10.8	0.0	7.7	0.0	39.9	17.0	0.0	30.5
Cycle Q Clear(g_c), s	6.1	11.1	6.6	6.5	10.8	0.0	7.7	0.0	39.9	17.0	0.0	30.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.07
Lane Grp Cap(c), veh/h	137	219	180	139	220	434	142	0	664	278	0	815
V/C Ratio(X)	0.67	0.80	0.50	0.71	0.78	0.00	0.81	0.00	0.94	0.91	0.00	0.72
Avail Cap(c_a), veh/h	150	359	295	159	368	560	191	0	719	302	0	844
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.4	46.1	44.1	48.5	45.8	0.0	48.8	0.0	30.9	44.2	0.0	21.7
Incr Delay (d2), s/veh	7.3	9.4	3.0	8.6	8.1	0.0	12.7	0.0	19.3	27.2	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	5.0	2.4	2.9	4.9	0.0	3.5	0.0	18.0	8.5	0.0	11.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.7	55.5	47.1	57.1	53.9	0.0	61.6	0.0	50.3	71.4	0.0	24.9
LnGrp LOS	E	E	D	E	D	A	E	A	D	E	A	C
Approach Vol, veh/h		358			269			737			840	
Approach Delay, s/veh		53.4			55.1			52.0			38.9	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.4	60.1	14.2	20.5	23.8	50.7	14.1	20.6
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 13	55.8	* 11	23.4	* 21	48.2	* 10	24.0
Max Q Clear Time (g_c+I1), s	9.7	32.5	8.5	13.1	19.0	41.9	8.1	12.8
Green Ext Time (p_c), s	0.0	5.2	0.0	1.1	0.1	2.6	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Intersection	
Intersection Delay, s/veh	34.5
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	372	477	743	844
Demand Flow Rate, veh/h	380	486	758	861
Vehicles Circulating, veh/h	912	762	532	391
Vehicles Exiting, veh/h	340	528	760	857
Ped Vol Crossing Leg, #/h	1	2	0	1
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	24.4	26.0	42.8	36.5
Approach LOS	C	D	E	E

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	380	486	758	861
Cap Entry Lane, veh/h	544	634	802	926
Entry HV Adj Factor	0.980	0.981	0.980	0.980
Flow Entry, veh/h	372	477	743	844
Cap Entry, veh/h	534	622	786	908
V/C Ratio	0.698	0.766	0.945	0.930
Control Delay, s/veh	24.4	26.0	42.8	36.5
LOS	C	D	E	E
95th %tile Queue, veh	5	7	14	14

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St
08/23/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	573	0	0	567	116	0	109	0	166	0	147
Future Volume (veh/h)	123	573	0	0	567	116	0	109	0	166	0	147
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	127	591	0	0	585	11	0	112	0	171	0	4
Peak Hour Factor	0.97	0.97	0.97	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	0	2	0	2	0	2
Cap, veh/h	145	817	0	0	585	485	0	436	0	182	0	0
Arrive On Green	0.09	0.49	0.00	0.00	0.35	0.35	0.00	0.26	0.00	0.11	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1387	0	1673	0	1594	171	
Grp Volume(v), veh/h	127	591	0	0	585	11	0	112	0	171	91.7	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1387	0	1673	0	1594	F	
Q Serve(g_s), s	7.8	27.6	0.0	0.0	34.5	0.5	0.0	5.2	0.0	10.5		
Cycle Q Clear(g_c), s	7.8	27.6	0.0	0.0	34.5	0.5	0.0	5.2	0.0	10.5		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	145	817	0	0	585	485	0	436	0	182		
V/C Ratio(X)	0.87	0.72	0.00	0.00	1.00	0.02	0.00	0.26	0.00	0.94		
Avail Cap(c_a), veh/h	145	817	0	0	585	485	0	458	0	182		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	44.3	20.0	0.0	0.0	32.1	21.1	0.0	28.9	0.0	43.4		
Incr Delay (d2), s/veh	39.2	3.2	0.0	0.0	37.4	0.0	0.0	0.7	0.0	48.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.6	10.9	0.0	0.0	19.7	0.2	0.0	2.2	0.0	6.6		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.5	23.2	0.0	0.0	69.5	21.1	0.0	29.6	0.0	91.7		
LnGrp LOS	F	C	A	A	F	C	A	C	A	F		
Approach Vol, veh/h		718			596			112				
Approach Delay, s/veh		33.9			68.6			29.6				
Approach LOS		C			E			C				
Timer - Assigned Phs		2			5	6	7	8				
Phs Duration (G+Y+Rc), s		54.0			13.7	40.3	16.0	28.7				
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0				
Max Green Setting (Gmax), s		48.2			* 9	34.5	* 11	27.0				
Max Q Clear Time (g_c+I1), s		29.6			9.8	36.5	12.5	7.2				
Green Ext Time (p_c), s		3.8			0.0	0.0	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			52.7									
HCM 6th LOS			D									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd
08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	233	74	223	138	303	54	502	218	321	631	41
Future Volume (veh/h)	50	233	74	223	138	303	54	502	218	321	631	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	271	76	259	160	50	63	584	244	373	734	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	35	164	46	199	123	282	99	387	162	237	674	41
Arrive On Green	0.15	0.15	0.15	0.20	0.20	0.20	0.06	0.35	0.35	0.15	0.43	0.43
Sat Flow, veh/h	230	1076	302	1003	620	1418	1594	1120	468	1594	1561	96
Grp Volume(v), veh/h	405	0	0	419	0	50	63	0	828	373	0	779
Grp Sat Flow(s),veh/h/ln	1608	0	0	1623	0	1418	1594	0	1588	1594	0	1656
Q Serve(g_s), s	22.8	0.0	0.0	29.8	0.0	4.4	5.8	0.0	51.8	22.3	0.0	64.8
Cycle Q Clear(g_c), s	22.8	0.0	0.0	29.8	0.0	4.4	5.8	0.0	51.8	22.3	0.0	64.8
Prop In Lane	0.14		0.19	0.62		1.00	1.00		0.29	1.00		0.06
Lane Grp Cap(c), veh/h	244	0	0	322	0	282	99	0	548	237	0	716
V/C Ratio(X)	1.66	0.00	0.00	1.30	0.00	0.18	0.64	0.00	1.51	1.57	0.00	1.09
Avail Cap(c_a), veh/h	244	0	0	322	0	282	106	0	548	237	0	716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.6	0.0	0.0	60.1	0.0	49.9	68.7	0.0	49.1	63.8	0.0	42.6
Incr Delay (d2), s/veh	313.3	0.0	0.0	155.6	0.0	0.4	7.8	0.0	238.9	277.8	0.0	60.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.4	0.0	0.0	26.0	0.0	1.6	2.5	0.0	56.2	27.2	0.0	37.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	376.9	0.0	0.0	215.7	0.0	50.3	76.5	0.0	288.0	341.6	0.0	102.8
LnGrp LOS	F	A	A	F	A	D	E	A	F	F	A	F
Approach Vol, veh/h		405			469			891			1152	
Approach Delay, s/veh		376.9			198.1			273.1			180.1	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	71.0		29.0	27.0	58.0		36.0				
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2				
Max Green Setting (Gmax), s	* 10	64.1		22.8	* 22	51.8		29.8				
Max Q Clear Time (g_c+I1), s	7.8	66.8		24.8	24.3	53.8		31.8				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			238.7									
HCM 6th LOS			F									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	53	98	83	36	53	37	447	71	50	593	135
Future Volume (veh/h)	180	53	98	83	36	53	37	447	71	50	593	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	180	53	46	83	36	6	37	447	4	50	593	120
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	216	111	96	205	179	30	109	745	628	129	619	125
Arrive On Green	0.14	0.14	0.14	0.13	0.13	0.13	0.07	0.45	0.45	0.08	0.46	0.46
Sat Flow, veh/h	1594	816	708	1594	1393	232	1594	1673	1409	1594	1350	273
Grp Volume(v), veh/h	180	0	99	83	0	42	37	447	4	50	0	713
Grp Sat Flow(s),veh/h/ln	1594	0	1524	1594	0	1625	1594	1673	1409	1594	0	1623
Q Serve(g_s), s	9.4	0.0	5.1	4.1	0.0	2.0	1.9	17.3	0.1	2.6	0.0	36.4
Cycle Q Clear(g_c), s	9.4	0.0	5.1	4.1	0.0	2.0	1.9	17.3	0.1	2.6	0.0	36.4
Prop In Lane	1.00		0.46	1.00		0.14	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	216	0	207	205	0	209	109	745	628	129	0	744
V/C Ratio(X)	0.83	0.00	0.48	0.40	0.00	0.20	0.34	0.60	0.01	0.39	0.00	0.96
Avail Cap(c_a), veh/h	279	0	267	353	0	360	279	781	657	279	0	758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.1	0.0	34.2	34.3	0.0	33.4	38.1	18.0	13.2	37.3	0.0	22.4
Incr Delay (d2), s/veh	12.4	0.0	0.6	0.5	0.0	0.2	0.7	1.5	0.0	0.7	0.0	23.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	1.9	1.6	0.0	0.8	0.7	6.2	0.0	1.0	0.0	16.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.4	0.0	34.9	34.8	0.0	33.6	38.8	19.4	13.2	38.0	0.0	45.4
LnGrp LOS	D	A	C	C	A	C	D	B	B	D	A	D
Approach Vol, veh/h		279			125			488			763	
Approach Delay, s/veh		43.6			34.4			20.9			44.9	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	45.1		14.7	10.7	44.0		16.3
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7
Max Green Setting (Gmax), s	15.0	40.0		19.0	15.0	40.0		15.0
Max Q Clear Time (g_c+I1), s	3.9	38.4		6.1	4.6	19.3		11.4
Green Ext Time (p_c), s	0.0	0.9		0.2	0.0	3.5		0.2

Intersection Summary	
HCM 6th Ctrl Delay	36.8
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	12	37	70	10	43	40	569	35	24	686	43
Future Volume (veh/h)	32	12	37	70	10	43	40	569	35	24	686	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	32	12	2	70	10	10	40	569	-5	24	686	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	84	236	262	36	24	102	783	663	69	749	634
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.06	0.47	0.00	0.04	0.45	0.00
Sat Flow, veh/h	1021	502	1410	954	215	146	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	44	0	2	90	0	0	40	569	-5	24	686	0
Grp Sat Flow(s),veh/h/ln	1523	0	1410	1315	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	0.0	0.0	0.1	2.9	0.0	0.0	1.5	17.2	0.0	0.9	24.1	0.0
Cycle Q Clear(g_c), s	1.4	0.0	0.1	4.4	0.0	0.0	1.5	17.2	0.0	0.9	24.1	0.0
Prop In Lane	0.73		1.00	0.78		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	354	0	236	322	0	0	102	783	663	69	749	634
V/C Ratio(X)	0.12	0.00	0.01	0.28	0.00	0.00	0.39	0.73	-0.01	0.35	0.92	0.00
Avail Cap(c_a), veh/h	712	0	583	671	0	0	279	798	676	279	798	676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.4	0.0	21.8	23.8	0.0	0.0	28.3	13.5	0.0	29.2	16.3	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.2	0.0	0.0	0.9	3.6	0.0	1.1	15.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.2	0.0	0.0	0.6	6.1	0.0	0.4	10.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	0.0	21.8	24.0	0.0	0.0	29.2	17.1	0.0	30.3	31.4	0.0
LnGrp LOS	C	A	C	C	A	A	C	B	A	C	C	A
Approach Vol, veh/h		46			90			604			710	
Approach Delay, s/veh		22.4			24.0			18.0			31.4	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.7	36.9		18.2	6.4	38.2		18.2
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7
Max Green Setting (Gmax), s	11.0	30.0		* 26	11.0	30.0		* 26
Max Q Clear Time (g_c+I1), s	3.5	26.1		6.4	2.9	19.2		3.4
Green Ext Time (p_c), s	0.0	2.0		0.2	0.0	3.6		0.1

Intersection Summary	
HCM 6th Ctrl Delay	25.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln
09/14/2023

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	114	228	155	537	679	96
Future Vol, veh/h	114	228	155	537	679	96
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	250	150	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	114	228	155	537	679	96

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1534	687	683	0	-	0
Stage 1	683	-	-	-	-	-
Stage 2	851	-	-	-	-	-
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	128	447	910	-	-	0
Stage 1	502	-	-	-	-	0
Stage 2	419	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 105	444	907	-	-	-
Mov Cap-2 Maneuver	238	-	-	-	-	-
Stage 1	415	-	-	-	-	-
Stage 2	418	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.4	2.2	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	907	-	238	444	-
HCM Lane V/C Ratio	0.171	-	0.479	0.514	-
HCM Control Delay (s)	9.8	-	33.3	21.4	-
HCM Lane LOS	A	-	D	C	-
HCM 95th %tile Q(veh)	0.6	-	2.4	2.9	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th TWSC
5: Murphy Ave & Healdsburg Ave
08/25/2023

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	863	54	22	651	45	111
Future Vol, veh/h	863	54	22	651	45	111
Conflicting Peds, #/hr	0	19	13	0	19	13
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	863	54	22	651	45	111

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	936	0	1623	922
Stage 1	-	-	-	-	909	-
Stage 2	-	-	-	-	714	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	732	-	113	327
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	485	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	720	-	106	318
Mov Cap-2 Maneuver	-	-	-	-	240	-
Stage 1	-	-	-	-	387	-
Stage 2	-	-	-	-	463	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	30.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	291	-	-	720	-
HCM Lane V/C Ratio	0.536	-	-	0.031	-
HCM Control Delay (s)	30.8	-	-	10.2	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	3	-	-	0.1	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St 08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	208	774	0	0	542	216	0	189	0	226	0	146
Future Volume (veh/h)	208	774	0	0	542	216	0	189	0	226	0	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	208	774	0	0	542	81	0	189	0	226	0	17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0	2	0	2
Cap, veh/h	230	893	0	0	592	490	0	347	0	248	0	0
Arrive On Green	0.14	0.53	0.00	0.00	0.35	0.35	0.00	0.21	0.00	0.16	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1385	0	1673	0	1594	226	
Grp Volume(v), veh/h	208	774	0	0	542	81	0	189	0	226	83.6	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1385	0	1673	0	1594	F	
Q Serve(g_s), s	16.7	52.2	0.0	0.0	40.3	5.2	0.0	13.1	0.0	18.2		
Cycle Q Clear(g_c), s	16.7	52.2	0.0	0.0	40.3	5.2	0.0	13.1	0.0	18.2		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	230	893	0	0	592	490	0	347	0	248		
V/C Ratio(X)	0.91	0.87	0.00	0.00	0.92	0.17	0.00	0.55	0.00	0.91		
Avail Cap(c_a), veh/h	248	992	0	0	671	555	0	347	0	273		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	54.9	26.3	0.0	0.0	40.2	28.9	0.0	46.2	0.0	54.1		
Incr Delay (d2), s/veh	30.6	7.6	0.0	0.0	16.9	0.2	0.0	3.1	0.0	29.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	8.7	22.0	0.0	0.0	19.4	1.8	0.0	5.8	0.0	9.4		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.4	33.9	0.0	0.0	57.1	29.1	0.0	49.3	0.0	83.6		
LnGrp LOS	F	C	A	A	E	C	A	D	A	F		
Approach Vol, veh/h		982			623			189				
Approach Delay, s/veh		44.8			53.5			49.3				
Approach LOS		D			D			D				
Timer - Assigned Phs		2			5	6	7	8				
Phs Duration (G+Y+Rc), s		75.3			23.5	51.8	24.9	30.0				
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0				
Max Green Setting (Gmax), s		77.2			* 20	52.2	* 22	27.0				
Max Q Clear Time (g_c+I1), s		54.2			18.7	42.3	20.2	15.1				
Green Ext Time (p_c), s		6.0			0.1	3.7	0.1	1.3				
Intersection Summary												
HCM 6th Ctrl Delay			52.3									
HCM 6th LOS			D									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	233	74	223	138	303	54	502	218	321	631	41
Future Volume (veh/h)	50	233	74	223	138	303	54	502	218	321	631	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	271	76	259	160	50	63	584	244	373	734	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	206	58	212	393	590	101	416	174	289	763	47
Arrive On Green	0.06	0.16	0.16	0.13	0.23	0.23	0.06	0.37	0.37	0.18	0.49	0.49
Sat Flow, veh/h	1594	1257	353	1594	1673	1418	1594	1120	468	1594	1561	96
Grp Volume(v), veh/h	58	0	347	259	160	50	63	0	828	373	0	779
Grp Sat Flow(s),veh/h/ln	1594	0	1610	1594	1673	1418	1594	0	1588	1594	0	1656
Q Serve(g_s), s	5.1	0.0	23.8	19.3	11.7	3.1	5.6	0.0	53.8	26.3	0.0	65.8
Cycle Q Clear(g_c), s	5.1	0.0	23.8	19.3	11.7	3.1	5.6	0.0	53.8	26.3	0.0	65.8
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.29	1.00		0.06
Lane Grp Cap(c), veh/h	99	0	264	212	393	590	101	0	589	289	0	810
V/C Ratio(X)	0.58	0.00	1.31	1.22	0.41	0.08	0.62	0.00	1.41	1.29	0.00	0.96
Avail Cap(c_a), veh/h	146	0	264	212	393	590	131	0	589	289	0	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.2	0.0	60.6	62.8	46.9	25.6	66.2	0.0	45.6	59.3	0.0	35.8
Incr Delay (d2), s/veh	2.0	0.0	165.2	134.2	1.0	0.1	2.3	0.0	192.5	154.1	0.0	22.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	21.6	15.6	5.0	1.1	2.3	0.0	51.9	22.7	0.0	30.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.2	0.0	225.8	197.0	47.9	25.7	68.5	0.0	238.1	213.4	0.0	58.6
LnGrp LOS	E	A	F	F	D	C	E	A	F	F	A	E
Approach Vol, veh/h		405			469			891			1152	
Approach Delay, s/veh		203.3			127.9			226.1			108.7	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.9	77.1	24.0	30.0	31.0	60.0	13.7	40.3				
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2				
Max Green Setting (Gmax), s	* 12	68.2	* 19	23.8	* 26	53.8	* 13	29.8				
Max Q Clear Time (g_c+I1), s	7.6	67.8	21.3	25.8	28.3	55.8	7.1	13.7				
Green Ext Time (p_c), s	0.0	0.2	0.0	0.0	0.0	0.0	0.0	1.2				
Intersection Summary												
HCM 6th Ctrl Delay			160.8									
HCM 6th LOS			F									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	233	74	223	138	303	54	502	218	321	631	41
Future Volume (veh/h)	50	233	74	223	138	303	54	502	218	321	631	41
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	58	271	76	259	160	50	63	584	244	373	734	45
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	229	194	212	347	551	101	446	187	289	806	49
Arrive On Green	0.06	0.14	0.14	0.13	0.21	0.21	0.06	0.40	0.40	0.18	0.52	0.52
Sat Flow, veh/h	1594	1673	1418	1594	1673	1418	1594	1120	468	1594	1561	96
Grp Volume(v), veh/h	58	271	76	259	160	50	63	0	828	373	0	779
Grp Sat Flow(s),veh/h/ln	1594	1673	1418	1594	1673	1418	1594	0	1588	1594	0	1656
Q Serve(g_s), s	5.1	19.8	7.1	19.3	12.2	3.2	5.6	0.0	57.8	26.3	0.0	62.3
Cycle Q Clear(g_c), s	5.1	19.8	7.1	19.3	12.2	3.2	5.6	0.0	57.8	26.3	0.0	62.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.29	1.00		0.06
Lane Grp Cap(c), veh/h	99	229	194	212	347	551	101	0	633	289	0	855
V/C Ratio(X)	0.58	1.19	0.39	1.22	0.46	0.09	0.62	0.00	1.31	1.29	0.00	0.91
Avail Cap(c_a), veh/h	129	229	194	212	347	551	126	0	633	289	0	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.2	62.6	57.1	62.8	50.4	28.1	66.2	0.0	43.6	59.3	0.0	32.0
Incr Delay (d2), s/veh	2.0	119.0	1.8	134.2	1.4	0.1	2.3	0.0	149.8	154.1	0.0	14.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	15.7	2.6	15.6	5.2	1.1	2.3	0.0	48.1	22.7	0.0	26.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.2	181.6	58.9	197.0	51.7	28.2	68.5	0.0	193.4	213.4	0.0	46.0
LnGrp LOS	E	F	E	F	D	C	E	A	F	F	A	D
Approach Vol, veh/h		405			469			891			1152	
Approach Delay, s/veh		142.3			129.4			184.6			100.2	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.9	81.1	24.0	26.0	31.0	64.0	13.7	36.3
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 12	72.6	* 19	19.8	* 26	57.8	* 12	27.4
Max Q Clear Time (g_c+I1), s	7.6	64.3	21.3	21.8	28.3	59.8	7.1	14.2
Green Ext Time (p_c), s	0.0	4.1	0.0	0.0	0.0	0.0	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	136.5
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Intersection	
Intersection Delay, s/veh	180.7
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	415	771	900	1155
Demand Flow Rate, veh/h	423	786	918	1178
Vehicles Circulating, veh/h	1393	719	715	491
Vehicles Exiting, veh/h	276	914	1101	1014
Ped Vol Crossing Leg, #/h	0	2	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	176.4	121.1	199.4	207.3
Approach LOS	F	F	F	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	423	786	918	1178
Cap Entry Lane, veh/h	333	663	665	836
Entry HV Adj Factor	0.980	0.981	0.981	0.981
Flow Entry, veh/h	415	771	900	1155
Cap Entry, veh/h	327	650	653	820
V/C Ratio	1.269	1.186	1.379	1.409
Control Delay, s/veh	176.4	121.1	199.4	207.3
LOS	F	F	F	F
95th %tile Queue, veh	19	26	40	50

HCM 6th Roundabout
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln

08/25/2023

Intersection			
Intersection Delay, s/veh	11.8		
Intersection LOS	B		

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	342	692	775
Demand Flow Rate, veh/h	349	706	791
Vehicles Circulating, veh/h	693	116	158
Vehicles Exiting, veh/h	256	926	664
Ped Vol Crossing Leg, #/h	4	4	4
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	13.5	9.9	12.7
Approach LOS	B	A	B

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	349	706	791
Cap Entry Lane, veh/h	681	1226	1174
Entry HV Adj Factor	0.980	0.981	0.980
Flow Entry, veh/h	342	692	775
Cap Entry, veh/h	667	1201	1151
V/C Ratio	0.513	0.576	0.674
Control Delay, s/veh	13.5	9.9	12.7
LOS	B	A	B
95th %tile Queue, veh	3	4	6

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	196	106	228	214	302	123	670	195	330	648	46
Future Volume (veh/h)	87	196	106	228	214	302	123	670	195	330	648	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	87	196	93	228	214	104	123	670	189	330	648	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	55	125	59	173	162	290	126	431	122	226	634	41
Arrive On Green	0.15	0.15	0.15	0.21	0.21	0.21	0.08	0.35	0.35	0.14	0.41	0.41
Sat Flow, veh/h	364	820	389	842	790	1415	1594	1248	352	1594	1554	101
Grp Volume(v), veh/h	376	0	0	442	0	104	123	0	859	330	0	690
Grp Sat Flow(s),veh/h/ln	1572	0	0	1631	0	1415	1594	0	1600	1594	0	1655
Q Serve(g_s), s	22.8	0.0	0.0	30.8	0.0	9.5	11.5	0.0	51.8	21.3	0.0	61.2
Cycle Q Clear(g_c), s	22.8	0.0	0.0	30.8	0.0	9.5	11.5	0.0	51.8	21.3	0.0	61.2
Prop In Lane	0.23		0.25	0.52		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	239	0	0	335	0	290	126	0	553	226	0	675
V/C Ratio(X)	1.57	0.00	0.00	1.32	0.00	0.36	0.97	0.00	1.55	1.46	0.00	1.02
Avail Cap(c_a), veh/h	239	0	0	335	0	290	126	0	553	226	0	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.6	0.0	0.0	59.6	0.0	51.1	68.9	0.0	49.1	64.3	0.0	44.4
Incr Delay (d2), s/veh	277.2	0.0	0.0	163.3	0.0	1.1	71.1	0.0	258.4	228.9	0.0	40.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.3	0.0	0.0	27.7	0.0	3.4	7.1	0.0	59.7	22.9	0.0	31.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	340.8	0.0	0.0	222.9	0.0	52.2	139.9	0.0	307.5	293.3	0.0	84.6
LnGrp LOS	F	A	A	F	A	D	F	A	F	F	A	F
Approach Vol, veh/h		376			546			982			1020	
Approach Delay, s/veh		340.8			190.4			286.5			152.1	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.6	67.4		29.0	26.0	58.0		37.0				
Change Period (Y+Rc), s	* 4.7	6.2		6.2	* 4.7	6.2		6.2				
Max Green Setting (Gmax), s	* 12	61.2		22.8	* 21	51.8		30.8				
Max Q Clear Time (g_c+I1), s	13.5	63.2		24.8	23.3	53.8		32.8				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		228.7
HCM 6th LOS		F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Gravenstein Hwy N & Mill Station Rd
08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	12	89	81	6	40	80	728	33	12	697	176
Future Volume (veh/h)	111	12	89	81	6	40	80	728	33	12	697	176
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	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			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	111	12	3	81	6	29	80	728	27	12	697	164
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	128	32	156	24	116	134	1021	846	45	723	170
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.08	0.61	0.61	0.03	0.55	0.55
Sat Flow, veh/h	1594	1292	323	1594	245	1182	1594	1673	1386	1594	1304	307
Grp Volume(v), veh/h	111	0	15	81	0	35	80	728	27	12	0	861
Grp Sat Flow(s),veh/h/ln	1594	0	1615	1594	0	1427	1594	1673	1386	1594	0	1611
Q Serve(g_s), s	7.3	0.0	0.9	5.2	0.0	2.5	5.3	32.6	0.8	0.8	0.0	55.6
Cycle Q Clear(g_c), s	7.3	0.0	0.9	5.2	0.0	2.5	5.3	32.6	0.8	0.8	0.0	55.6
Prop In Lane	1.00		0.20	1.00		0.83	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	158	0	160	156	0	140	134	1021	846	45	0	893
V/C Ratio(X)	0.70	0.00	0.09	0.52	0.00	0.25	0.60	0.71	0.03	0.27	0.00	0.96
Avail Cap(c_a), veh/h	163	0	165	279	0	249	150	1021	846	147	0	916
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.4	0.0	44.5	46.6	0.0	45.3	48.0	14.6	8.4	51.7	0.0	23.2
Incr Delay (d2), s/veh	10.4	0.0	0.1	1.0	0.0	0.3	2.9	2.6	0.0	1.2	0.0	21.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.4	2.1	0.0	0.9	2.1	11.3	0.2	0.3	0.0	23.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	0.0	44.6	47.5	0.0	45.6	50.9	17.2	8.4	52.9	0.0	44.6
LnGrp LOS	E	A	D	D	A	D	D	B	A	D	A	D
Approach Vol, veh/h		126			116			835			873	
Approach Delay, s/veh		56.3			47.0			20.1			44.7	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.8	66.0		14.4	6.7	72.1		15.5
Change Period (Y+Rc), s	3.7	5.8		3.7	3.7	5.8		4.7
Max Green Setting (Gmax), s	10.2	61.8		19.0	10.0	62.0		11.1
Max Q Clear Time (g_c+I1), s	7.3	57.6		7.2	2.8	34.6		9.3
Green Ext Time (p_c), s	0.0	2.6		0.2	0.0	7.6		0.0

Intersection Summary		
HCM 6th Ctrl Delay		35.1
HCM 6th LOS		D

HCM 6th Signalized Intersection Summary
3: Gravenstein Hwy N & Hurlbut Ave
08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	22	105	32	14	16	87	708	34	19	836	59
Future Volume (veh/h)	84	22	105	32	14	16	87	708	34	19	836	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.97	0.98		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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	84	22	28	32	14	-9	87	708	0	19	836	-6
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	248	55	218	319	142	0	130	956	810	54	876	742
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.00	0.08	0.57	0.00	0.03	0.52	0.00
Sat Flow, veh/h	1088	350	1382	712	362	-210	1594	1673	1418	1594	1673	1418
Grp Volume(v), veh/h	106	0	28	0	0	0	87	708	0	19	836	-6
Grp Sat Flow(s),veh/h/ln	1438	0	1382	0	0	0	1594	1673	1418	1594	1673	1418
Q Serve(g_s), s	5.1	0.0	1.5	0.0	0.0	0.0	4.5	26.8	0.0	1.0	40.6	0.0
Cycle Q Clear(g_c), s	5.7	0.0	1.5	0.0	0.0	0.0	4.5	26.8	0.0	1.0	40.6	0.0
Prop In Lane	0.79		1.00	0.86		-0.24	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	303	0	218	0	0	0	130	956	810	54	876	742
V/C Ratio(X)	0.35	0.00	0.13	0.00	0.00	0.00	0.67	0.74	0.00	0.35	0.95	-0.01
Avail Cap(c_a), veh/h	513	0	421	0	0	0	149	956	810	149	899	762
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.6	0.0	30.9	0.0	0.0	0.0	38.0	13.6	0.0	40.3	19.4	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.1	0.0	0.0	0.0	6.1	3.4	0.0	1.4	19.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.5	0.0	0.0	0.0	1.9	9.5	0.0	0.4	18.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.8	0.0	31.0	0.0	0.0	0.0	44.2	16.9	0.0	41.7	39.2	0.0
LnGrp LOS	C	A	C	A	A	A	D	B	A	D	D	A
Approach Vol, veh/h		134			0			795			849	
Approach Delay, s/veh		32.4			0.0			19.9			39.5	
Approach LOS		C						B			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.7	53.4		21.2	6.6	57.5		21.2
Change Period (Y+Rc), s	3.7	8.8		* 7.7	3.7	8.8		* 7.7
Max Green Setting (Gmax), s	8.0	45.8		* 26	8.0	45.8		* 26
Max Q Clear Time (g_c+I1), s	6.5	42.6		0.0	3.0	28.8		7.7
Green Ext Time (p_c), s	0.0	2.0		0.0	0.0	6.1		0.4

Intersection Summary		
HCM 6th Ctrl Delay		30.2
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	4.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	86	162	190	863	842	169
Future Vol, veh/h	86	162	190	863	842	169
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	250	150	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	86	162	190	863	842	169

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2093	850	846	0	-	0
Stage 1	846	-	-	-	-	-
Stage 2	1247	-	-	-	-	-
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	~ 58	360	791	-	-	0
Stage 1	421	-	-	-	-	0
Stage 2	271	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 44	358	788	-	-	-
Mov Cap-2 Maneuver	153	-	-	-	-	-
Stage 1	319	-	-	-	-	-
Stage 2	270	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	34.2	2	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	788	-	153	358	-
HCM Lane V/C Ratio	0.241	-	0.562	0.453	-
HCM Control Delay (s)	11	-	55.1	23.1	-
HCM Lane LOS	B	-	F	C	-
HCM 95th %tile Q(veh)	0.9	-	2.9	2.3	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	1.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	976	39	53	1015	35	62
Future Vol, veh/h	976	39	53	1015	35	62
Conflicting Peds, #/hr	0	27	19	0	27	19
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	976	39	53	1015	35	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1042	0	2171	1042
Stage 1	-	-	-	-	1023	-
Stage 2	-	-	-	-	1148	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	667	-	51	279
Stage 1	-	-	-	-	347	-
Stage 2	-	-	-	-	302	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	652	-	45	268
Mov Cap-2 Maneuver	-	-	-	-	158	-
Stage 1	-	-	-	-	339	-
Stage 2	-	-	-	-	271	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	35.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	214	-	-	652	-
HCM Lane V/C Ratio	0.453	-	-	0.081	-
HCM Control Delay (s)	35.1	-	-	11	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	2.2	-	-	0.3	-

HCM 6th Signalized Intersection Summary
6: Healdsburg Ave & N Main St

08/25/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	857	0	0	911	120	0	109	0	183	0	139
Future Volume (veh/h)	96	857	0	0	911	120	0	109	0	183	0	139
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	0	0	1673	1673	0	1673	0	1673	0	1673
Adj Flow Rate, veh/h	96	857	0	0	911	14	0	109	0	183	0	-5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	0	0	2	2	0	2	0	2	0	2
Cap, veh/h	99	1031	0	0	874	725	0	299	0	184	0	0
Arrive On Green	0.06	0.62	0.00	0.00	0.52	0.52	0.00	0.18	0.00	0.12	0.00	0.00
Sat Flow, veh/h	1594	1673	0	0	1673	1388	0	1673	0	1594	183	
Grp Volume(v), veh/h	96	857	0	0	911	14	0	109	0	183	130.4	
Grp Sat Flow(s),veh/h/ln	1594	1673	0	0	1673	1388	0	1673	0	1594	F	
Q Serve(g_s), s	9.0	60.4	0.0	0.0	78.2	0.7	0.0	8.6	0.0	17.2		
Cycle Q Clear(g_c), s	9.0	60.4	0.0	0.0	78.2	0.7	0.0	8.6	0.0	17.2		
Prop In Lane	1.00		0.00	0.00		1.00	0.00		0.00	1.00		
Lane Grp Cap(c), veh/h	99	1031	0	0	874	725	0	299	0	184		
V/C Ratio(X)	0.97	0.83	0.00	0.00	1.04	0.02	0.00	0.37	0.00	0.99		
Avail Cap(c_a), veh/h	99	1031	0	0	874	725	0	302	0	184		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	70.1	22.6	0.0	0.0	35.8	17.3	0.0	54.0	0.0	66.1		
Incr Delay (d2), s/veh	80.0	5.9	0.0	0.0	42.0	0.0	0.0	1.6	0.0	64.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.9	24.7	0.0	0.0	41.7	0.2	0.0	3.8	0.0	10.3		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	150.0	28.5	0.0	0.0	77.7	17.3	0.0	55.6	0.0	130.4		
LnGrp LOS	F	C	A	A	F	B	A	E	A	F		
Approach Vol, veh/h		953			925			109				
Approach Delay, s/veh		40.8			76.8			55.6				
Approach LOS		D			E			E				
Timer - Assigned Phs		2			5	6	7	8				
Phs Duration (G+Y+Rc), s		98.0			14.0	84.0	22.0	29.7				
Change Period (Y+Rc), s		5.8			* 4.7	5.8	* 4.7	3.0				
Max Green Setting (Gmax), s		92.2			* 9.3	78.2	* 17	27.0				
Max Q Clear Time (g_c+I1), s		62.4			11.0	80.2	19.2	10.6				
Green Ext Time (p_c), s		7.6			0.0	0.0	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			64.4									
HCM 6th LOS			E									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd

08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	196	106	228	214	302	123	670	195	330	648	46
Future Volume (veh/h)	87	196	106	228	214	302	123	670	195	330	648	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	87	196	93	228	214	104	123	670	189	330	648	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	152	72	190	328	515	142	523	148	267	773	50
Arrive On Green	0.07	0.14	0.14	0.12	0.20	0.20	0.09	0.42	0.42	0.17	0.50	0.50
Sat Flow, veh/h	1594	1062	504	1594	1673	1415	1594	1248	352	1594	1554	101
Grp Volume(v), veh/h	87	0	289	228	214	104	123	0	859	330	0	690
Grp Sat Flow(s),veh/h/ln	1594	0	1566	1594	1673	1415	1594	0	1600	1594	0	1655
Q Serve(g_s), s	7.8	0.0	20.8	17.3	17.1	7.3	11.0	0.0	60.8	24.3	0.0	52.1
Cycle Q Clear(g_c), s	7.8	0.0	20.8	17.3	17.1	7.3	11.0	0.0	60.8	24.3	0.0	52.1
Prop In Lane	1.00		0.32	1.00		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	107	0	225	190	328	515	142	0	671	267	0	824
V/C Ratio(X)	0.82	0.00	1.29	1.20	0.65	0.20	0.86	0.00	1.28	1.24	0.00	0.84
Avail Cap(c_a), veh/h	137	0	225	190	328	515	148	0	671	267	0	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.8	0.0	62.1	63.8	53.8	31.7	65.1	0.0	42.1	60.3	0.0	31.4
Incr Delay (d2), s/veh	19.7	0.0	158.3	129.1	5.2	0.3	35.0	0.0	137.3	133.9	0.0	7.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	17.9	13.8	7.6	2.5	5.8	0.0	48.5	19.6	0.0	21.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.5	0.0	220.4	193.0	58.9	32.0	100.1	0.0	179.4	194.3	0.0	39.3
LnGrp LOS	F	A	F	F	E	C	F	A	F	F	A	D
Approach Vol, veh/h		376			546			982			1020	
Approach Delay, s/veh		189.4			109.8			169.5			89.4	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.7	78.3	22.0	27.0	29.0	67.0	14.4	34.6				
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2				
Max Green Setting (Gmax), s	* 14	71.6	* 17	20.8	* 24	60.8	* 13	25.6				
Max Q Clear Time (g_c+I1), s	13.0	54.1	19.3	22.8	26.3	62.8	9.8	19.1				
Green Ext Time (p_c), s	0.0	5.7	0.0	0.0	0.0	0.0	0.0	1.1				
Intersection Summary												
HCM 6th Ctrl Delay			133.0									
HCM 6th LOS			F									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	196	106	228	214	302	123	670	195	330	648	46
Future Volume (veh/h)	87	196	106	228	214	302	123	670	195	330	648	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673	1673
Adj Flow Rate, veh/h	87	196	93	228	214	104	123	670	189	330	648	42
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	193	158	190	280	484	143	550	155	278	817	53
Arrive On Green	0.07	0.12	0.12	0.12	0.17	0.17	0.09	0.44	0.44	0.17	0.53	0.53
Sat Flow, veh/h	1594	1673	1376	1594	1673	1414	1594	1248	352	1594	1554	101
Grp Volume(v), veh/h	87	196	93	228	214	104	123	0	859	330	0	690
Grp Sat Flow(s),veh/h/ln	1594	1673	1376	1594	1673	1414	1594	0	1600	1594	0	1655
Q Serve(g_s), s	7.8	16.7	9.3	17.3	17.7	7.6	11.0	0.0	63.9	25.3	0.0	49.2
Cycle Q Clear(g_c), s	7.8	16.7	9.3	17.3	17.7	7.6	11.0	0.0	63.9	25.3	0.0	49.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	107	193	158	190	280	484	143	0	705	278	0	870
V/C Ratio(X)	0.82	1.02	0.59	1.20	0.76	0.21	0.86	0.00	1.22	1.19	0.00	0.79
Avail Cap(c_a), veh/h	110	193	158	190	280	484	170	0	705	278	0	870
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.8	64.2	60.9	63.8	57.6	33.9	65.1	0.0	40.6	59.8	0.0	28.0
Incr Delay (d2), s/veh	33.0	69.3	6.7	129.1	12.4	0.3	26.9	0.0	110.7	114.3	0.0	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	10.6	3.5	13.8	8.4	2.6	5.5	0.0	45.6	18.8	0.0	19.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.8	133.4	67.5	193.0	70.0	34.2	92.0	0.0	151.3	174.1	0.0	33.3
LnGrp LOS	F	F	E	F	E	C	F	A	F	F	A	C
Approach Vol, veh/h		376			546			982			1020	
Approach Delay, s/veh		109.4			114.5			143.9			78.9	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.7	82.4	22.0	22.9	30.0	70.1	14.4	30.5
Change Period (Y+Rc), s	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2	* 4.7	6.2
Max Green Setting (Gmax), s	* 16	73.7	* 17	16.7	* 25	63.9	* 10	24.0
Max Q Clear Time (g_c+I1), s	13.0	51.2	19.3	18.7	27.3	65.9	9.8	19.7
Green Ext Time (p_c), s	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	111.3
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Roundabout
1: Gravenstein Hwy N & Occidental Rd 08/29/2023

Intersection	
Intersection Delay, s/veh	181.7
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	389	744	988	1024
Demand Flow Rate, veh/h	397	759	1007	1045
Vehicles Circulating, veh/h	1231	897	626	576
Vehicles Exiting, veh/h	390	736	1002	1080
Ped Vol Crossing Leg, #/h	1	2	0	1
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	81.7	201.2	198.5	189.5
Approach LOS	F	F	F	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	397	759	1007	1045
Cap Entry Lane, veh/h	393	553	729	767
Entry HV Adj Factor	0.980	0.980	0.981	0.980
Flow Entry, veh/h	389	744	988	1024
Cap Entry, veh/h	385	542	715	751
V/C Ratio	1.010	1.373	1.382	1.363
Control Delay, s/veh	81.7	201.2	198.5	189.5
LOS	F	F	F	F
95th %tile Queue, veh	12	34	43	43

HCM 6th Roundabout
4: Healdsburg Ave/Gravenstein Hwy N & Covert Ln 08/25/2023

Intersection	
Intersection Delay, s/veh	23.9
Intersection LOS	C

Approach	EB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	248	1053	1011
Demand Flow Rate, veh/h	253	1074	1031
Vehicles Circulating, veh/h	859	88	194
Vehicles Exiting, veh/h	366	1024	968
Ped Vol Crossing Leg, #/h	4	4	4
Ped Cap Adj	0.999	0.999	0.999
Approach Delay, s/veh	13.5	21.0	29.4
Approach LOS	B	C	D

Lane	Left	Left	Left
Designated Moves	LR	LT	TR
Assumed Moves	LR	LT	TR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	253	1074	1031
Cap Entry Lane, veh/h	575	1261	1132
Entry HV Adj Factor	0.980	0.980	0.981
Flow Entry, veh/h	248	1053	1011
Cap Entry, veh/h	563	1236	1110
V/C Ratio	0.441	0.852	0.911
Control Delay, s/veh	13.5	21.0	29.4
LOS	B	C	D
95th %tile Queue, veh	2	11	14