Dorsey Marketplace

Final Environmental Impact Report

(SCH # 2016022053)

City of Grass Valley

Prepared by Dudek

October 2019

Dorsey Marketplace
Final Environmental Impact Report

Prepared for:

City of Grass Valley
125 E Main Street
Grass Valley, California 95945
Contact: Thomas Last, Community Development Director

Prepared by:

DUDEK
853 Lincoln Street, Suite 208
Auburn, California 95603
Contact: Katherine Waugh

OCTOBER 2019

CHAPTER 3
DRAFT EIR TEXT REVISIONS

This chapter provides those pages from the Draft EIR on which text revisions or additions were made. The revisions are shown in blue font for new text and red strikethrough font for deleted text.

TABLE OF CONTENTS

TABLES

APPENDICES

EXECUTIVE SUMMARY

ES.1 PROJECT LOCATION

The project site is bordered by State Route (SR) 20/49 to the west, Dorsey Drive to the north, the Old Barn and Ernie's Storage to the south, and the Grass Valley Terrace Apartments to the east. The site is located between the SR 20/49 off-ramps for Dorsey Drive and Idaho-Maryland Road. The project would be accessible from Dorsey Drive and from Spring Hill Drive, which accesses Idaho-Maryland Road.

The 26.8-acre site is located at approximately 39°13′41.3″N 121°02′33.8″W and contains three parcels, designated by Assessor's Parcel Numbers: 035-260-062, 035-260-063, and 035-260-064.

ES.2 PROJECT SITE CHARACTERISTICS

The project site was the former location of the Spring Hill Mine, which operated at the site intermittently during the late 1800s and through the 1940s. Abandoned mine features located on site include excavations, pits, remnants of building foundations, stockpiles of mine waste rock, and dry tailings ponds.

Topography and Soils

The native topsoil at the project site consists of clay, gravelly clay, and sandy clay. Beneath the clay layer is the bedrock consisting of diabase and serpentine rock. In the trenches that appear on the site, the diabase and serpentine rocks are moderately to severely weathered. In these trenches, the clay layer over the serpentine and diabase was 2.5 feet thick. As noted in the Removal Action Work Plan for the site, the Dubakella complex dominated the majority of the site's soil conditions. The site is a part of the ultramafic–mafic "basement" of the Lake Combie complex. The approximately 26.8-acre project site is relatively flat and gently slopes from the northern boundary to the southern and southwestern boundary and over a knoll in the north central area. The western and central portions of the project site contain significant abandoned mine features and the eastern portion of the project site is largely undeveloped. Surface conditions in the south-central and eastern portion of the site are generally obscured by dense manzanita. Existing elevations on site range from between 2,610 feet above mean sea level (amsl) at the southern boundary (where Spring Hill Drive currently terminates), 2,704 feet amsl at the highest point on the site, and 2,690 feet amsl at the northern boundary of the site along Dorsey Drive. Rock outcrop is present at several locations in the western, northern, and eastern portions of the property.

Vegetation

The communities identified on the project site are broadly classified, whenever possible, into alliances and associations as described in *A Manual of California Vegetation* (Sawyer et al., 2009

as cited in Appendix E). Five land cover types exist on the project site. A majority of the site is composed of whiteleaf manzanita (*Acrtostaphylos viscida*) chaparral and McNab cypress (*Hesperocyparis macanbiana*) woodland with smaller portions consisting of ponderosa pine (*Pinus ponderosa*) forest, Fremont cottonwood (*Populus fremonti*) woodland, and ruderal/developed lands (Appendix E).

Whiteleaf Manzanita Chaparral

Chaparral communities are located throughout the site including: along the southern boundary adjacent to the existing Spring Hill Drive; along the northeastern boundary of the project site adjacent to the Grass Valley Terrace Apartments; in the tip of the southeastern corner; and along most of the western portion of the site. The shrub canopy in the chaparral is dense and little vegetation grows under the shrubs (Appendix E).

McNab Cypress Woodland

McNab cypress woodland, a sensitive natural community, is located in the northeastern corner adjacent to Dorsey Drive and in the southeastern corner. McNab cypress woodland overstory on site is dominated by McNab cypress with minimal herbaceous vegetation in the understory. This canopy was generally short (less than 20 feet in height) and was either densely clustered or scattered with whiteleaf manzanita chaparral between trees. McNab cypress woodland is a fire-adapted species known to occur primarily on soils derived from basalt, conglomerate, gabbro, greenstone or serpentine substrates (Appendix E).

Ponderosa Pine Forest

Ponderosa pine forest is located in the central portion of the project site extending to the eastern boundary adjacent to the Grass Valley Terrace Apartments. Ponderosa pine trees are the dominant plant in this vegetation community and trees on site are tall and well-spaced allowing for the growth of a sparse shrub layer in the understory (Appendix E).

Cottonwood Forest

One patch of cottonwood forest is located on the project site in the western portion along the southern boundary. This area is the lowest point on the property and it appears that water runoff from the hillside collects there; although no standing water was noted during the site survey conducted by Dudek on March 4, 2016 (Appendix E).

Ruderal/Developed

Ruderal and developed land consists of a gravel parking lot and several cleared dirt access roads along the northern boundary of the site adjacent to Dorsey Drive extending south toward the center

of the project site and historic mining facilities including cement foundations and mine tailing depressions in the western portion of the project site bordering SR 20/49 (Appendix E). Ruderal and developed lands are areas that have been altered through human disturbance and may support a variety of native and nonnative vegetation.

Waters of the United States

Potentially jurisdictional waters and wetlands are regulated by the U.S. Army Corps of Engineers (ACOE) under Section 404 of the federal Clean Water Act, the Regional Water Quality Control Board (RWQCB) under Section 401 of the Clean Water Act and the Porter-Cologne Act, and CDFW under Section 1602 of the California Fish and Game Code. Pursuant to the federal Clean Water Act, ACOE jurisdictional areas include those supporting hydric soils, hydrology and hydrophytic vegetation. Aquatic features on site include ~~numerous~~ several erosional channels and one depression located at the southwestern end of the project site. Based on historical aerial photos and visual inspection during the site visit, the Biological Technical Report completed for the project concluded that two of these features – the cement-lined ditch along the site's western boundary and the ephemeral drainage in the southwestern corner – are only periodically inundated and tend to remain inundated for short periods, depending on frequency and duration of rainfall events (Appendix C). The project site supports a seasonal wetland located south of the ephemeral drainage and an intermittent drainage in the southwestern portion of the site. The seasonal wetland receives water from the ephemeral drainage and from the surrounding hillsides, then discharges this water to the intermittent drainage, which ~~. This~~ drainage ties into an existing City of Grass Valley storm drain, which outfalls to Wolf Creek. Because the intermittent drainage is hydrologically connected to a waters of the United States, this feature is also likely to fall within the jurisdiction of the ACOE as a waters of the United States ~~(Appendix~~ and the jurisdiction of the RWQCB and CDFW as a water of the state (Appendix E). The seasonal wetland is also considered likely to fall within the jurisdiction of the ACOE as a waters of the United States and the jurisdiction of the RWQCB as a water of the state.

Surrounding Land Uses

SR 20/49 runs parallel to the project site along the site's western boundary. There are three self-storage facilities to the south (Old Barn, Ernie's, and Springhill), as well as Bub Enterprises Inc. To the southeast, there is Gold Country Gymnasium and Bikram's Yoga. To the north of this and east of the project site, separated by open space, are the Grass Valley Terrace Apartments. To the north of the proposed project site, on the other side of Dorsey Drive, are the Springhill Garden Apartments. Additionally, across SR 20/49 there are sensitive populations in the Golden Empire Nursing and Rehab Center and the Sierra Nevada Memorial Hospital.

ES.3 PROJECT OBJECTIVES

The project applicant has set forth the following objectives for the proposed project:

- Create a high-quality mixed-use infill project combining residential, retail, and community uses through the re-use of an existing brownfield site consistent with the City's plans for the Core Priority Development Area and its Economic Strategic Plan.
- Develop an infill site adjoining and proximate to existing infrastructure, high density residential, affordable and senior housing, Sierra Nevada Memorial Hospital and medical offices, and existing businesses along Idaho-Maryland Road.
- Construct the Spring Hill Drive connector between Dorsey Drive and Idaho Maryland Road, consistent with the City's General Plan.
- Incorporate safe and convenient walking paths, access to public transit, and enhanced bicycle circulation.
- Redevelop the property to allow for the environmental clean-up of a brownfield former mining site.
- Develop the project site in such a way as to make a positive contribution to the City's satisfaction of its Regional Housing Needs Allocation through the creation of new quality high-density market-rate housing.
- Create new retail uses that will capture more local sales tax dollars, reducing the amount of sales tax leakage from City and County residents shopping in other jurisdictions, and reducing vehicle miles traveled, air quality impacts and greenhouse gas emissions associated with shopping destinations outside the area.
- Develop a retail mixed use center that incorporates quality design, local art and community amenities that delivers a lifestyle oriented experience.
- Develop a diverse mix of retail uses that allows a single vehicle trip to the project site verses multiple vehicle trips to a number of retail locations to enjoy a similar shopping experience, thereby reducing vehicle miles traveled, air quality impacts and greenhouse gas emissions.
- Develop a mixed-use project that includes high-density residential uses to reduce the need for vehicular trips to satisfy resident retail needs.

ES.4 DESCRIPTION OF PROPOSED PROJECT CHARACTERISTICS

The project site is currently designated under the General Plan as Business Park and zoned Corporate Business Park. This EIR evaluates two Project Alternatives with an equal weight environmental analysis.

Both Alternative A and Alternative B require a General Plan Amendment and rezone to change land currently designated for Business Park to Commercial and Residential Urban High Density and a rezone from Corporate Business Park to Commercial (C-2) and Multiple Dwelling Residential (R-3).

Alternative A proposes to develop approximately 178,960 square feet of commercial building space and 90 multiple-family dwelling units. Within the commercial component of the project, there would be four major shops (with sizes ranging between 20,00 and 40,000 square feet), six smaller shops (with sizes between 3,800 and 7,200 square feet), and three pads for drive-through services such as restaurants and financial institutions (with sizes between 3,000 and 4,000 square feet). The six smaller shops are proposed in the northern and eastern portions of the site, with three of the four major shops proposed for the southwestern portion and one major shop for the northern portion. Parking would be placed in the central and western portions of the site. The proposed dwelling units would be offered as market-rate rental units and are expected to include 50 two-bedroom units and 20 each of the one- and three-bedroom layouts. The units would range in size from 1,013 to 1,600 square feet. They would be constructed as two-story buildings in the southeastern corner of the project site. This area would also include an apartment clubhouse and pool. A small dog park is also proposed along the eastern site boundary, south of proposed Pad 4.

Alternative B proposes to develop approximately 104,350 square feet of commercial building space, 8,500 square feet of office space and ~~171~~ 172 multiple-family dwelling units. Two major shops (35,000 and 21,500 square feet), five smaller shops (with sizes between 4,000 and 8,500 square feet), three pads for drive-through services such as ~~fast-food~~ restaurants and financial institutions (sizes between 3,200 and 4,200 square feet) and one 6,000-sqare-foot pad that would support food service and other commercial uses without a drive-through. The two major shops and two of the five small shops are proposed in the northwestern portion of the site adjacent to the SR 20/49 off-ramp. The other three small shops would be located in the eastern portion of the site adjacent to the central spine road. As in Alternative A, the four pads would generally be located in the northeastern portion of the site near the project site entrance on Dorsey Drive. Parking would be placed in the central and western portions of the site and bus shelters would be provided on both sides of the central drive adjacent to Shop E. This alternative would construct ~~171~~ 172 residential apartments that would be offered as market-rate rental units and are expected to include ~~95~~ 96 two-bedroom units and 38 each of the one- and three-bedroom layouts. The units would range in size from 1,013 to 1,600 square feet. They would be constructed as two-story and three-story buildings in the southern portion of the project site. One of the buildings would include approximately 50% apartment space and 50% office space, providing 8,500 square feet of office space near the center of the project site. Alternative B would also include an apartment clubhouse and pool and tot lot park area. A small dog park is also proposed along the eastern site boundary, south of proposed Pad 4.

ES.5 AREAS OF KNOWN CONTROVERSY AND ISSUES RAISED

Section 15123 (b)(2) of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.) requires the executive summary of an environmental impact report (EIR) to disclose areas of controversy known to the lead agency that have been raised by the agencies and the public. The City of Grass Valley (City) received 7 letters in response to the Notice of Preparation (NOP) that was circulated to solicit agency and public comments on the scope and environmental analysis to be included in the EIR. The NOP and the comments received by the City are included in Appendix A of this Draft EIR. The following concerns were raised in the responses to the NOP and at the public scoping meeting for this EIR:

- Traffic generation and proximity to SR 20/49, specifically the Dorsey Drive Interchange
- Safety concerns regarding the project's use of Spring Hill Drive
- Increased development changing the visual character of the City
- Loss of habitat
- Visual impacts such as signage and light pollution
- Air quality impacts from idling delivery trucks as well as retail goods from overseas
- The location of the project site within Airport Land Use compatibility zone D, Urban Overlay Zone

ES.6 PROJECT ALTERNATIVES

The alternatives chapter of the EIR (Chapter 17, Alternatives) was prepared in accordance with Section 15126.6 of the CEQA Guidelines. The alternatives analyzed in this EIR in addition to Alternative A and Alternative B are:

- **Alternative 1a: No Project/No Build** This alternative would not develop the project site.
- **Alternative 1b: No Project/Existing Designations** This alternative would develop the project site in accordance with existing land use designations.
- **Alternative 2: Reduced Development** This alternative would reduce the amount of commercial development by about 15% and residential development by 50% in an effort to reduce impact levels.
- **Alternative 3: Vertical Mixed Use** The alternative entails a vertical mixed use development with a reduced project footprint that would reduce the amount of commercial development by about 15% and increase residential development by about 15% in an effort to reduce impact levels.

- **Alternative 4: Tiered Alternative** This alternative would create a tiered project site, featuring three tiers separated by sloped grades to more closely match the natural grade of the site. It would develop 138,700 sf. of commercial retail space and 90 multifamily apartments.

ES.7 INTENDED USES OF THE DORSEY MARKETPLACE EIR

The Draft EIR has been prepared in accordance with CEQA (California Public Resources Code, Section 21000 et seq.) and the CEQA Guidelines (14 CCR 15000 et seq.). The Draft EIR is an informational document prepared to provide public disclosure of potential impacts of the project and is not intended to serve as a recommendation of either approval or denial of the project. As lead agency, the City "is responsible for the adequacy and objectivity of the draft EIR" (14 CCR 15084(e)). Section 15121(a) of the CEQA Guidelines states:

> An EIR is an informational document which will inform public agency decision-makers and the public generally of the significant environmental effect of the project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project.

This Draft EIR is a "project EIR" pursuant to CEQA Guidelines Section 15161. A Project EIR examines the environmental impacts of a specific project. This type of EIR focuses on the changes in the environment that would result from implementation of the project, including construction and operation. As the lead agency for this project, the City is required to consider the information in the EIR along with any other available information in deciding whether to approve the project entitlements requested. The basic requirements for an EIR include providing information that establishes the environmental setting (or project baseline), and identifying environmental impacts, mitigation measures, project alternatives, growth-inducing impacts, and cumulative impacts. In a practical sense, an EIR functions as a method of fact-finding, allowing an applicant, the public, other public agencies, and agency staff an opportunity to collectively review and evaluate baseline conditions and project impacts through a process of full disclosure. Additionally, this EIR provides the primary source of environmental information for the lead agency to consider when exercising any permitting authority or approval power directly related to implementation of this project.

Required Permits and Approvals

Table ES-1 lists the entitlements and approvals required from the City and from other responsible agencies for the proposed project. Following the table is a discussion of each of the entitlements and approvals required from the City and the approvals and permits required from other agencies.

Table ES-1
Required Approvals/Permits for Dorsey Marketplace

Required Permit/Approval	Permitting Agency
General Plan Amendment	City of Grass Valley
Rezone	City of Grass Valley
Development Review Permit	City of Grass Valley
Use permit	City of Grass Valley
Lot Line Adjustment	City of Grass Valley
Encroachment Permit	California Department of Transportation
Waste Discharge Requirements permit	Central Valley Regional Water Quality Control Board
Clean Water Act Section 401 Water Quality Certification	Central Valley Regional Water Quality Control Board
Clean Water Act Section 404 Permit	U.S. Army Corps of Engineers
Streambed Alteration Agreement	California Department of Fish and Wildlife
Authority to Construct	Northern Sierra Air Quality Management District
Permit to Operate	Northern Sierra Air Quality Management District

ES.8 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Table ES-2 lists all of the impacts associated with the proposed project, as evaluated in this EIR. The table identifies the level of significance of each impact and presents the mitigation measures (MMs) necessary to reduce impacts to a less than significant level.

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
Land Use				
3-1 Would the project conflict with land use plans, policies, or regulations?	Alternative A	Potentially Significant	Mitigation Measures 6a, 6b, 6c, 6d, 6e, 6f, 7a, 9b, 9c, 9d, 10a, and 10b (see full text below)	Less than Significant
	Alternative B	Potentially Significant	Mitigation Measures 6a, 6b, 6c, 6d, 6e, 6f, 7a, 9a, 9c, 9d, 10a, and 10b (see full text below)	Less than Significant
3-2 Would the project conflict with surrounding land uses, current and planned, or physically divide an existing community?	Alternative A	Potentially Significant	Mitigation Measures 5a, 8a, 8b, 8c, 8d, 8e, 8f, 8g, 9c, 10a, 10b, and 15a (see full text below)	Less than Significant
	Alternative B	Potentially Significant	Mitigation Measures 5a, 8a, 8e, 8h, 9c, 10a, 10b, and 15a (see full text below)	Less than Significant
Population, Housing, and Employment				
4-1 Would the project induce substantial population growth in the area?	Both Alternatives	Less than Significant	None Required	Less than Significant
4-2 Would the project displace substantial numbers of existing housing and/or people, necessitating the construction of replacement housing elsewhere?	Both Alternatives	No Impact	None Required	No Impact
4-3 Would the project reduce the affordable housing supply, impair the City's ability to meet its RHNA obligations, or create a substantial increase in demand for affordable housing?	Both Alternatives	Less than Significant	None Required	Less than Significant
4-4 Would the project contribute to significant cumulative impacts associated with population, employment, and housing?	Both Alternatives	Less than Significant	None Required	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
Aesthetics				
5-1 Would the project substantially damage scenic resources, including but not limited to, trees, rocks, outcroppings, and historic buildings?	Both Alternatives	Potentially Significant	MM 5a: Final landscaping plans shall be approved by the City of Grass Valley Planning Division prior to issuance of any grading permits for the project site. The landscape plan shall be drawn to scale and shall show the locations of existing trees and plant material to be retained and the location and proposed design of landscaped areas and the varieties and sizes of plant materials to be planted. The final landscaping plans shall demonstrate compliance with the following standards: • Landscaping along the western, southern, and eastern site boundaries shall include a mixture of shrubs and trees spaced such that there is sufficient room for each plant to grow while also providing visual screening of large walls, loading docks, and parking areas. This may be accomplished with staggered meandering rows of planting that provide depth and natural variation in placement and plant materials/species. At a minimum, perimeter landscaping shall include species that typically reach heights at least as tall as the proposed buildings, and shall have sufficient quantities of vegetation such that at maturity, the vegetation will fully block sections of views that are at least 10 feet in length, spaced a minimum of 30 feet apart to a height of 8 feet. In the sections between those where views are fully blocked and at heights greater than 8 feet, views of the development must be screened with varying amounts of landscaping. • Loading and service areas for delivery or transfer of merchandise including vehicle access to those areas shall be screened from public view corridors and building entries by a combination of building design, layout, grade separations, masonry walls and dense landscaping. • Site areas not used for buildings, parking or other designated functions shall be landscaped.	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			• All trees planted within the site shall be transplanted from five-gallon or larger size containers. • Landscaped areas shall utilize predominantly low-maintenance, native and adaptive drought-tolerant plantings that conserve water and facilitate the use of drip irrigation. • Landscaped areas shall use native trees and vegetation selected and placed to create a "natural forest" character in the landscape. • Parking lot landscaping shall meet the requirements of the City of Grass Valley Municipal Code Section 17.34.030. • The project site entrances at Dorsey Drive and Spring Hill Drive shall be landscaped with a mixture of ground cover, flowers, shrubs, and trees. At each entrance, landscaping shall be provided on both sides of the street and in median islands. • Along the project site frontage on Dorsey Drive and along the on-site section of Spring Hill Drive, at least one street tree shall be properly installed for each 30-foot length of right-of-way and shall be maintained in compliance with the City of Grass Valley Municipal Code Section 17.34.140 (Maintenance of Landscape Areas). The review authority may modify this requirement depending on the chosen tree species and its typical spread at maturity. • The project applicant shall post with the City of Grass Valley surety in the form of cash, letter of credit, performance bond, or instrument of credit, in an amount equal to 150% of the total value of all plant materials, irrigation, installation, and maintenance. Such surety shall be posted with the City for a 2-year period in compliance with Grass Valley Municipal Code Section 17.74.050 (Performance Guarantees). • Prior to issuance of any certificates of occupancy for structures within the project site, the project applicant shall submit to the	

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			Planning Division a letter signed by a licensed landscape architect, or the landscape contractor who performed the installation certifying that the landscaping and irrigation for the project has been installed in compliance with the approved plans.	
5-2 Would the project substantially degrade the existing visual character or quality of the project site and its surroundings?	Both Alternatives	Potentially Significant	MM 5a (see above)	Less than Significant
5-3 Would the project create a new source of substantial light or glare?	Both Alternatives	Less than Significant	None Required	Less than Significant
5-4 Would the project contribute to cumulative impacts to the visual character of the region?	Both Alternatives	Less than Significant	None Required	Less than Significant
Biological Resources				
6-1 Would the project have a substantial adverse effect on candidate, sensitive or special-status species?	Both Alternatives	Potentially Significant	MM 6a: Prior to issuance of grading permits, focused surveys for special-status plant species shall be conducted by a qualified project biologist according to the following protocol and guidance: CNPS Botanical Survey Guidelines (CNPS 2001); Protocols for Surveying and Evaluating Impacts to Special Status Native Populations and Sensitive Natural Communities (CDFW 2018); and U.S. Fish and Wildlife Service General Rare Plant Survey Guidelines (Cypher 2002). The pre-construction survey shall be conducted during a period when the target species would be observable and identifiable (e.g., blooming period). If special-status plants are detected during pre-construction surveys, the location of the species will be mapped. If impacts to special-status plants cannot be avoided, the following measures will be implemented: 1. Special-status plants in the vicinity of the disturbance will be temporarily fenced or prominently flagged and a 50-foot buffer	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			established around the populations to prevent inadvertent encroachment by vehicles and equipment during the activity; 2. Seeds/bulbs will be collected and stored in appropriate storage conditions (e.g., cool and dry), and dispersed/transplanted to an area that would not be impacted following the construction activity and reapplication of salvaged topsoil; and 3. The top 6 inches of topsoil will be salvaged, stockpiled, and replaced as soon as practicable after project completion. The salvaged topsoil shall be redistributed at the same depth and contoured to blend with surrounding grades. Additionally, while it is not expected that a federally or state-listed plant would be observed during these surveys, the applicant shall consult with the applicable agency (i.e., CDFW and/or USFWS) and written concurrence for measures required for federally or state-listed plant species, if observed. If federal or state-listed plant species are observed, the applicant will submit a 2081(b) incidental take permit application to CDFW and a Biological Assessment for the "take" of certain plants that would be affected by the project. As part of the consultation process, a plan to transplant federal or state-listed species will be developed. A transplantation plan for any observed state or federally listed plants will be prepared that includes the following: 1. The area of occupied habitat to be preserved and removed. 2. Identification of on-site or off-site preservation, restoration, or enhancement locations. 3. Methods for preservation, restoration, enhancement, and/or translocation. 4. A replacement ratio and success standard of 1:1 for impacted individuals. 5. A monitoring program to ensure mitigation success. 6. Adaptive management and remedial measures in the event that performance stands are not achieved.	

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			7. Financial assurances and a mechanism for conservation of any mitigation lands required in perpetuity. ~~a special-status plant species survey shall be conducted at a time when special-status plants are evident and identifiable to determine if they are present on site. Surveys shall be conducted by a qualified biologist knowledgeable of the plant species in the region and shall be floristic in nature. If any special-status plant species are identified during the surveys, a no-disturbance buffer shall be created by the qualified biologist around the species. The perimeter of the buffer zone shall be fenced or marked with staked flags. If avoidance is not possible, consultation shall be initiated with CDFW or USFWS, depending on the status of the species, to determine if transplantation, seed salvage, or other propagation measures are appropriate to conserve the species. If no evidence exists that special-status plant species are present on the project site, then no further mitigation is required.~~ MM 6b: Prior to issuance of grading permits, the project applicant shall develop, in consultation with the CDFW, a Survey, Avoidance and Relocation Plan for Blainsville's horned lizard. The Survey and Avoidance provisions shall include, but not be limited to, the timing and location of the surveys that shall be conducted; the locations where more intensive efforts shall be conducted; the reporting mechanism that shall be used to document survey results; and measures to reduce the potential for this species moving onto the site during construction. The Relocation provisions shall include, but not be limited to, the proposed relocation site(s); the habitat and conditions in the proposed relocation site(s); the methods that shall be utilized for trapping and relocating the individual species; and mechanisms for documentation/recordation of the species and number of the animals relocated.	

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			The Survey, Avoidance and Relocation Plan shall be submitted to CDFW for approval 60 days prior to any vegetation removal or ground disturbing activities within potentially occupied habitat, which is limited to the California chaparral habitat as shown in Figure 6-1. The Plan shall include the specific survey efforts that shall occur for construction activities that occur both during the activity period of this species (generally March to November) and for periods when the species may be present in the work area but difficult to detect due to weather conditions (generally December through February). Prior to commencement of vegetation removal and grading activities, an exclusion fence shall be installed around the portions of the California chaparral habitat where vegetation removal and grading will occur. During vegetation removal activities, a pre-construction clearance survey shall be performed in potentially suitable habitat for this species at the beginning of each day by a qualified biologist to prevent the take of any Blainville's horned lizards. If any Blainville's horned lizards are observed during surveys, they shall be relocated outside of the project boundary to the designated relocation site and project activities shall resume upon clearance by the designated biologist. ~~a pre-construction survey shall be conducted at a time when Blainville's horned lizard is reasonably expected to be active to determine if they are present on site. Surveys shall be conducted by a qualified biologist knowledgeable of the lizard species in the region. If any Blainville's horned lizard are identified during the surveys, a no-disturbance buffer shall be created by the qualified biologist around the species. The perimeter of the buffer zone shall be fenced or marked with staked flags. If avoidance is not possible, consultation shall be initiated with CDFW to determine if relocation is appropriate to conserve the species. If no evidence exists that Blainville's~~	

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			~~horned lizard are present on the project site, then no further mitigation is required.~~ MM 6c: Should construction begin during the bird breeding season (February 1 through September 30), a pre-construction nesting bird survey shall be performed by a qualified biologist no sooner than 14 days prior to any groundbreaking activities or tree removal to determine if there are any active nests within the project area (including a 200-foot buffer for raptors). If the construction site remains inactive for more than 1 month during the breeding season and construction would resume during the breeding season, another pre-construction nesting bird survey shall be performed no sooner than 14 days prior to reactivation of construction activities on site. If any active nests are observed during surveys, an avoidance buffer shall be determined and flagged by the qualified biologist based on species, location, and planned construction activity (e.g. 50 feet for passerines to 250-500 feet for raptors). These nests shall be avoided until the chicks have fledged and the nests are no longer active, as determined by the qualified biologist. Avoidance could consist of delaying construction in proximity to the nest during the nesting season, or creating a buffer zone between the nest and the activity. If active nests are present, ~~P~~project activities shall be confined to daylight hours to prevent impacts to foraging nocturnal avian species. If preconstruction surveys indicate nests are inactive or potential habitat is unoccupied during construction period, no further mitigation is required. MM 6d: All construction workers shall receive worker environmental awareness program training conducted by a qualified biologist or an environmentally trained construction manager. Worker environmental awareness program training may also be conducted through a video created by a qualified biologist	

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			specifically for this project. Worker environmental awareness program training shall instruct workers to recognize all special-status species potentially present in the project area; identify their habitat; and discuss the nature and purpose of protective measures, including best management practices and other required mitigation measures. Personnel shall be instructed to avoid wetlands and waters on the project site, other than where impacts have been authorized, and to prevent spills, and shall be given contact information for the qualified biologist.	
6-2 Would the project have a substantial adverse effect on riparian habitat or other sensitive natural communities?	Both Alternatives	Potentially Significant	MM 6e: Prior to issuance of grading permits, the project applicant shall submit to the City evidence that compensatory habitat conservation and/or restoration for the loss of McNab Cypress woodland and cottonwood forest is incorporated within the proposed landscaping plans and/or has been provided for through purchase of credits in a habitat mitigation bank and/or establishment of a conservation easement or other mechanism providing for the site's perpetual conservation on an offsite parcel that supports McNab Cypress woodland and/or cottonwood forest that is of similar habitat quality to that existing on the project site. The habitat conservation and/or restoration shall occur over a total area of 3.15 acres for McNab cypress woodland and 0.62 acres for cottonwood forest. This may include a combination of on-site replanting and restoration and off-site restoration sufficient to ensure no net loss of habitat functions or values. ~~has been or will be completed. This may include a combination of on-site replanting and restoration and off-site restoration sufficient to ensure no net loss of habitat functions or values.~~ On-site planting may include restoration of the disturbed areas of McNab Cypress woodland and cottonwood forest, as well as planting of individual McNab Cypress and Fremont cottonwood trees as part of the proposed landscaping plan.	Less than Significant

6-3 Would the project have a substantial adverse effect on federally protected wetlands?	Both Alternatives	Potentially Significant	MM 6f: To the extent practicable, the project shall be designed to avoid impacts to the jurisdictional waters of the U.S. or state within the project site, and the following avoidance/minimization measures shall be implemented: • Any material/spoils from project activities shall be located away from jurisdictional areas and protected from stormwater runoff using temporary perimeter sediment barriers such as berms, silt fences, fiber rolls, covers, sand/gravel bags, and straw bale barriers, as appropriate. • Materials shall be stored on impervious surfaces or plastic ground covers to prevent any spills or leakage from contaminating the ground and generally at least 50 feet from the top of bank. • Any spillage of material shall be stopped if it can be done safely. The contaminated area shall be cleaned and any contaminated materials properly disposed of. For all spills the project foreman or designated environmental representative shall be notified. Where impacts to jurisdictional waters cannot be avoided, minimization measures shall be applied and all necessary resource agency permits shall be obtained. This may include a Nationwide Permit from the ACOE, Water Quality Certification or Individual or General Waste Discharge Requirements from the RWQCB, and a Streambed Alteration Agreement from CDFW. Proof of compliance shall be submitted to the Grass Valley Planning Department prior to issuance of building and grading permits and/or demonstration that avoidance of jurisdictional waters will occur during construction. All temporary impacts to federal- and state-jurisdictional waters shall be restored on site. Restoration will include recontouring and erosion control with a native seed mix. Prior to seeding temporary ground disturbance areas, the project biologist will review the seeding palette to ensure that no seeding of invasive plant species, as identified in the most recent version of the California Invasive Plant Inventory for the region, will occur. Compensatory mitigation for permanent impacts shall occur off site, and shall occur at a ratio no less than 1:1 for the impact to jurisdictional waters or at a higher ratio if so determined in the	Less than Significant

			jurisdictional waters permits. A waters mitigation and monitoring plan shall be prepared that outlines the compensatory mitigation in coordination with the ACOE, RWQCB, and CDFW. Mitigation lands shall be comprised of drainages similar to those impacted. Off-site mitigation lands shall be preserved through a conservation easement and the waters mitigation and monitoring plan shall identify an approach for funding assurance for the long-term management of the conserved land. Suitable mitigation lands provided for species, if any are identified, may also be used for mitigation of jurisdictional waters of the state. The proposed 1:1 acreage ratio (or higher ratio if so determined in the jurisdictional waters permits) is considered sufficient to reduce project effects to less than significant because the type of potentially affected jurisdictional features (i.e., ephemeral drainages) are relatively common in the context of regional drainage. It is noted that the final mitigation ratio required by the ACOE, RWQCB and CDFW for acquisition of regulatory permits may differ, but shall be no less than 1:1.~~Prior to issuance of a grading permit, the project applicant shall acquire a Clean Water Act Section 404 permit and Section 401 Water Quality Certification. To compensate for the loss of jurisdictional wetlands associated with proposed activities, the project applicant shall (1) restore and/or create wetlands on site; (2) create wetlands at an off-site location acceptable to the resource agencies; (3) purchase compensatory mitigation credits at an agency-approved mitigation bank; or (4) a combination of 1, 2, or 3. The project applicant shall develop the mitigation approach in conjunction with the resource agencies during the permitting process. The mitigation requirements shall be in compliance with federal and state Clean Water Act laws. The final mitigation ratios, design, and implementation shall comply with the terms and conditions of the Section 404 permit issued by the Sacramento District U.S. Army Corps of Engineers and the Section 401 Water Quality Certification and Waste Discharge Requirements issued by the Central Valley Regional Water Quality Control Board.~~	
6-4 Would the project interfere substantially with wildlife movement?	Both Alternatives	Less than Significant	None Required	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
6-5 Would the project conflict with local policies or ordinances protecting biological resources?	Both Alternatives	Less than Significant	None Required	Less than Significant
6-6 Would the project conflict with provisions of an approved regional, state, or local habitat conservation plan?	Both Alternatives	No Impact	None Required	No Impact
6-7 Would the project contribute to significant cumulative impacts to biological resources?	Both Alternatives	Less than Significant	None Required	Less than Significant
Cultural Resources				
7-1 Would the project cause a substantial adverse change in the significance of a historical resource, archaeological resource, or tribal cultural resource?	Both Alternatives	Potentially Significant	MM 7a: All construction workers shall receive worker cultural resources awareness training conducted by a qualified archaeologist, and shall receive a worker cultural resources awareness brochure prepared by the same qualified archaeologist. Worker cultural resources awareness training may also be conducted through a video created by a qualified archaeologist specifically for this project. The program shall include relevant information regarding sensitive tribal cultural resources, including applicable regulations, protocols for avoidance, and consequences of violating state laws and regulations. The worker cultural resources awareness training shall also describe appropriate avoidance and minimization measures for resources that have the potential to be located on the project site, and shall outline what to do and who to contact if any potential archaeological resources or artifacts are encountered. The program shall also underscore the requirement for confidentiality and culturally appropriate treatment of any kind of significance related to Native Americans and behaviors, consistent with Native American tribal values. Worker cultural resources awareness training shall instruct workers to recognize potential cultural resources, such	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			as the presence of discolored or dark soil, fire-affected material, concentrations of lithic materials, or other characteristics observed to be atypical of the surrounding area; lithic or bone tools that appear to have been used for chopping, drilling, or grinding; projectile points; fired clay ceramics or non-functional items; non-local high-quality materials such as chert and obsidian; and historic artifacts such as glass bottles and shards, ceramic material, building or domestic refuse, ferrous metal, or old features such as concrete foundations or privies. Prior to issuance of a grading permit, the City of Grass Valley shall verify that project construction documents include the following note: "If any cultural resources, such as structural features, mining equipment, unusual amounts of bone or shell artifacts, or architectural remains, are encountered during any construction activities, the contractor shall suspend all work within 100 feet of the find and immediately notify the City's Community Development Director." Further, the project applicant shall undertake the following: • Retain a qualified archaeologist to conduct an investigation of the site as needed to assess the resources (i.e., whether it is a "historical resource" or a "unique archaeological resource") and to provide management recommendations should potential impacts to the resource be found to be significant (possible management recommendations for historical or unique archaeological resources could include resource avoidance or data recovery excavations where avoidance is infeasible in light of project design or layout, or is unnecessary to avoid significant effects). • Consult with the United Auburn Indian Community (UAIC) to determine if the find is a tribal cultural resource. If so, consultation with the UAIC shall be consistent with the requirements of California Public Resources Code Sections	

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			21084.3(a) and (b) and CEQA Guidelines Section 15370, and shall include consideration of requiring compensation for the impact by replacing or providing substitute resources or environments. • As warranted by any cultural resources found on site, prepare reports for resources identified as potentially eligible for listing in the California Register of Historical Resources in consultation with the State Historic Preservation Officer, and if applicable, tribal representatives.	
7-2 Would the project disturb any human remains, including those interred outside of dedicated cemeteries?	Both Alternatives	Less than Significant	None Required	Less than Significant
7-3 Could project construction contribute to a cumulative loss of cultural resources?	Both Alternatives	Less than Significant	None Required	Less than Significant
Transportation				
8-1 Would the project result in an increase in traffic that is substantial in relation to the existing traffic volumes and capacity on SR 20/49?	Both Alternatives	Less than Significant	None Required	Less than Significant
8-2 Would the project result in an increase in traffic that is substantial in relation to the existing traffic volumes and capacity on City of Grass Valley roadways and intersections?	Alternative A	Potentially Significant	MM 8a: Under either Alternative A or Alternative B, prior to issuance of a building permit, the project applicant shall ~~pay a fair-share contribution towards the~~ construct~~ion of~~ a larger concrete porkchop barrier within the existing acceleration lane to restrict all movements from the eastbound approach at the Idaho Maryland Road/ Brunswick Road intersection to right turns. Additionally, under either Alternative A or Alternative B, prior to issuance of a building permit, the project applicant shall pay the City of Grass Valley Traffic Impact Fee, which includes a fair-	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			share contribution towards signalization of this intersection consistent with the City's Capital Improvement Program. MM 8b: Under Alternative A and Alternative B, prior to issuance of a building permit, the project applicant shall pay the Western Nevada County Regional Transportation Mitigation Fee, which includes a fair-share contribution towards the ~~construction~~ installation of ~~either~~ a traffic signal ~~or a roundabout~~ at the Idaho Maryland Road/State Route 20/49 northbound ramps intersection, consistent with the Western Nevada County Regional Transportation Mitigation Fee improvement program.	
	Alternative B	Potentially Significant	MM 8a: (see above) (Note: MM 8b applies to Alternative B under Impact 8-9 but not under Impact 8-2.)	Less than Significant
8-3 Would the project increase impacts to vehicle safety due to roadway design features or incompatible uses?	Both Alternatives	No Impact	None Required	No Impact
8-4 Would the project result in inadequate emergency access or access to nearby uses?	Both Alternatives	No Impact	None Required	No Impact
8-5 Would the project create hazards or barriers for pedestrians or bicyclists?	Both Alternatives	Less than Significant	None Required	Less than Significant
8-6 Would the project conflict with adopted policies, plans, or programs supporting alternative transportation or otherwise decrease the performance or safety of such facilities?	Both Alternatives	Less than Significant	None Required	Less than Significant
8-7 Would the project cause a change in air traffic patterns, including either an increase in traffic	Both Alternatives	Less than Significant	None Required	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
levels or a change in location resulting in substantial safety?				
8-8 Would the project result in increased vehicle circulation or congestion due to a lack of sufficient parking capacity to support the proposed land uses	Both Alternatives	No Impact	None Required	No Impact
8-9 Would the project contribute to a cumulative increase in traffic that conflicts with adopted policies and plans related to intersection and roadway segment function, including consideration of LOS and ADT?	Alternative A	Potentially Significant	MM 8a: (see above) MM 8b: (see above) MM 8c: Under Alternative A, prior to issuance of the first certificate of occupancy for the project site~~a building permit~~, the project applicant shall ~~pay a fair-share contribution towards the construction~~ install ~~of~~ a traffic signal at the Dorsey Drive/Catherine Lane intersection. MM 8d: Under Alternative A, prior to issuance of the first certificate of occupancy for the project site, the project applicant shall ~~pay a fair share contribution towards the~~ fully fund agency staff time needed to complete signal optimization of the Dorsey Drive/SR 20/49 SB/EB On-Ramp/Joerschke Drive traffic signal MM 8e: Under Alternative A or Alternative B, prior to issuance of a building permit, the project applicant shall pay the City of Grass Valley Traffic Impact Fee, which includes a fair share contribution towards the City's planned improvements ~~construction of either a traffic signal or roundabout~~ at the Dorsey Drive/Sutton Way intersection, consistent with the City's Capital Improvement Program. MM 8f: Under Alternative A, prior to issuance of a building permit, the project applicant shall restripe the southbound approach to the Idaho Maryland Road/Spring Hill Drive intersection to create a southbound right-turn pocket. MM 8g: Under Alternative A, prior to issuance of a building permit, the project applicant shall pay the City of Grass Valley Traffic	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			Impact Fee, which includes a fair share contribution towards ~~the construction~~ installation of a traffic signal ~~or roundabout~~ at the Bennett Street/SR 49/20 SB Off-Ramp/Tinloy Street intersection., consistent with the City's Capital Improvement Program	
	Alternative B	Potentially Significant	MM 8a: (see above) MM 8b: (see above) MM 8e: (see above) MM 8h: Under Alternative B, prior to issuance of the first certificate of occupancy for the project site, the project applicant shall pay a fair share contribution towards the signal optimization of the traffic signals at the Dorsey Drive/SR 20/49 SB Ramp/Joerschke Drive intersection and the Dorsey Drive/SR 20/49 NB Ramps intersection.	Less than Significant
Noise				
9-1 Would the project expose persons to or generate noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies?	Alternative A	Potentially Significant	MM 9b: Under Alternative A, a noise assessment shall be performed to address potential noise impacts to the apartment buildings immediately south of Shops C, D, and E to determine the exposure to noise from commercial mechanical equipment noise and truck delivery noise at Shops C, D, and E and at Major 4. Under Alternative B the noise assessment shall consider noise exposure associated with commercial mechanical equipment noise and truck delivery noise at Shops C, D, and E and at Major 1. For either alternative the assessment shall identify requirements to construct noise barriers for commercial noise sources and/or implement increased construction standards within the affected apartment buildings to ensure that interior noise levels will be 45 dB or less.	Less than Significant
	Alternative B	Potentially Significant	MM 9a: Under Alternative B only, a noise attenuation barrier shall be constructed between the proposed residential apartment	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			buildings in the southwestern corner of the site and SR 20/49. Further, where windows on the second and third floors of buildings adjacent to SR 20/49 and its off-ramp have a direct line of sight to the highway and/or off-ramp shall have a minimum Sound Transmission Class (STC) rating of 32. The noise attenuation barrier shall be a minimum height of 6 feet and shall be constructed of concrete or other solid material that is rigid and has a minimum density of 20 kilograms/square meter. Additionally, the noise attenuation barrier shall be constructed in accordance with the Caltrans standards outlined in Chapter 1100 of the Highway Design Manual. The City of Grass Valley shall ensure that the noise barriers are shown on construction plans prior to issuance of grading permits and shall verify the barriers have been constructed as required prior to issuance of certificates of occupancy. MM 9b: (see above)	
9-2 Would the project expose persons to or generate excessive ground-borne vibration or ground-borne noise?	Both Alternatives	Less than Significant	None Required	Less than Significant
9-3 Would the project substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	Both Alternatives	Potentially Significant	MM 9c: Under Alternative A and Alternative B, a noise assessment of the mechanical equipment for the proposed residential units east of Spring Hill Drive shall be completed to identify the noise levels to which adjacent neighbors could be exposed and to identify noise control methods (such as placing equipment further from the adjacent neighbors and using barriers to screen the equipment) sufficient to ensure that noise levels at the nearest sensitive receptor do not exceed 55 dBA during daytime hours and 50 dBA during nighttime hours.	Less than Significant
9-4 Would the project result in a substantial temporary or periodic increase in ambient noise levels in	Both Alternatives	Potentially Significant	MM 9d: Prior to issuance of grading and/or building permits, City staff shall ensure that project Grading and Building Plans identify locations for all stationary noise-generating construction	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
the project vicinity above levels existing without the project?			equipment, such as air compressors, that are located as far as practical from nearby homes. The project applicant shall submit a list of the construction equipment proposed to be used (including horsepower), a schedule for the use of each piece of equipment during that phase, and the general location where each piece of equipment would operate. Where such equipment must be located near adjacent residences, project Grading and Improvement plans shall include provisions to provide reduce noise exposure to nearby receptors such as modifying the equipment list, restrictions on the number of individual pieces of equipment that may be used at one time, modifying the location of individual pieces of equipment such that they are 150 feet from the nearest sensitive receptor or providing acoustical shielding of ~~such~~ stationary equipment when achieving 150 feet of separation is not feasible, use of temporary noise attenuation barriers, and/or other measures that are demonstrated to be sufficient to ensure ~~prior to issuance of grading and/or building permits~~that the maximum noise level at the property boundary would remain at or below 90 dB and increases in hourly noise levels at the property boundary would not exceed 10 dBA above the ambient noise level for two or more hours per day Additionally, City staff shall ensure that the Grading and Building Plans include the following notes: A. Construction noise emanating from any construction activities for which a grading or building permit is required shall be prohibited on Sundays and federal holidays, and shall occur only as follows: • Monday through Friday, 76:00 a.m. to 78:00 p.m. • Saturday, 78:00 a.m. to 76:00 p.m. B. All construction equipment shall be fitted with factory-installed muffling devices, and all construction equipment shall be maintained in good working condition to lower the	

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			likelihood of any piece of equipment emitting noise beyond the standard decibel level for that equipment. C. All equipment and vehicles shall be turned off when not in use. D. Unnecessary idling of internal combustion engines shall be prohibited. E. Idling shall be limited to no more than 5 minutes.	
9-5 Would the project result in traffic noise levels causing a substantial permanent increase in cumulative noise levels?	Both Alternatives	Less than Significant	None Required	Less than Significant
Air Quality				
10-1 Would the project conflict with or obstruct implementation of the applicable air quality plan?	Both Alternatives	Less than Significant	None Required	Less than Significant
10-2 Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?	Both Alternatives	Potentially Significant	MM 10a: Prior to issuance of grading permits, the City of Grass Valley shall verify that construction contracts include requirements for construction contractor(s) to implement the following measures: • Alternatives to open burning of vegetative material will be used unless otherwise deemed infeasible by the NSAQMD. Among suitable alternatives are chipping, mulching, or conversion to biomass fuel. • Fugitive dust shall be controlled as required by District Rules • All exposed surfaces shall be watered two times daily. Exposed surfaces include, but are not limited to soil piles, graded areas, unpaved parking areas, staging areas, and access roads. • Haul trucks transporting soil, sand, or other loose material on the site must be loaded with a minimum of two feet of freeboard. Any haul trucks that would be traveling along freeways or major roadways shall be covered.	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			• Wet power vacuum street sweepers shall be used to remove any visible trackout mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited. • Vehicle speeds on unpaved roads shall be limited to 15 miles per hour. • All roadways, driveways, sidewalks, parking lots to be paved shall be completed as soon as possible. In addition, building pads shall be laid within 4 months of grading unless seeding or soil binders are used. • Grid power shall be used (as opposed to diesel generators) for job site power needs where feasible during construction. • No equipment or vehicles may idle for more than 5 minutes. Clear signage that posts this requirement for workers shall be posted at the entrances to the site. • The construction contractor shall provide the City with current certificate(s) of compliance for CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation [California Code of Regulations, Title 13, sections 2449 and 2449.1]. • Temporary traffic control shall be provided during all phases of the construction to improve traffic flow as deemed appropriate by local transportation agencies and/or Caltrans. • Construction activities shall be scheduled to direct traffic flow to off-peak hours as much as practicable. • Minimize active earthmoving and the generation of fugitive dust to the extent feasible when pedestrians walk by active project construction sites. • The project applicant shall implement the Removal Action Workplan (RAW) as approved by the California Department of Toxic Substances Control prior to construction of the proposed project. Throughout all activities conducted in implementation of the RAW, contractors must adhere to each component of the	

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			RAW, including, but not limited to the Site Safety Plan and the Asbestos Dust Mitigation Plan. MM 10b: Prior to issuance of grading and building permits, the City of Grass Valley shall verify that building plans include provisions for the following measures to reduce air pollutant emissions throughout project operation: • There shall be a limit of one wood-burning appliance per residence, and it shall be an EPA Phase II certified appliance. Also, each residence shall be equipped with a non-wood-burning source of heat. • The project applicant shall provide, operate, and fund a green-waste drop-off site for residents. • Streets shall be designed to maximize pedestrian access to transit stops. • The project shall provide for pedestrian access between bus service and major transportation points within the project, and between separate sections of the project, where feasible.	
10-3 Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project area is in nonattainment under an applicable federal or state ambient air quality standard (including the release of emissions that exceed quantitative thresholds for ozone precursors)?	Both Alternatives	Less than Significant	None Required	Less than Significant
10-4 Would the project expose sensitive receptors to substantial pollutant concentrations?	Both Alternatives	Less than Significant	None Required	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
10-5 Would the project create objectionable odors affecting a substantial number of people?	Both Alternatives	Less than Significant	None Required	Less than Significant
Climate Change				
11-1 Would the project impede the City or state efforts to meet AB 32 standards for the reduction of GHG emissions?	Both Alternatives	Potentially Significant	MM 11a: The following GHG emission reduction measures shall be implemented: *All residential buildings shall:* • Meet or exceed CALGreen Tier 1 requirements in place at the time of Building Permit issuance. • ~~Be pre-plumbed and structurally engineered for the installation of~~ Include a ~~complete~~ solar energy system consistent with the 2019 California Building Code. • Include a tankless water heating system, a whole house ceiling fan, and "Energy Star" appliances (stoves, dishwashers, and any other appliances typically included within the initial installation by the builder). • Include programmable thermostat timers. • Include exterior outlets on all residential buildings to allow the use of electrically-powered landscape equipment. • Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application for each residence only utilize low flow water fixtures such as low flow toilets, faucets, showers, etc. • Prior to approval of Improvement Plans the applicant shall only show energy efficient lighting for all street, parking, and area lighting associated with the proposed project, including all on-site and off-site lighting. • Pave all parking lots with reflective coatings (albedo = 0.30 or better). This measure is considered feasible if the additional	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			cost is less than 10% of the cost of applying a standard asphalt product. • •Install EV charging stations on 1.5% of the constructed parking spaces, in addition to installing the infrastructure necessary to support future EV charging stations consistent with the 2019 California Building Code *All non-residential buildings shall:* • Be pre-plumbed and structurally engineered for the installation of a complete solar energy system. • Prior to the issuance of non-residential building permits, the proposed project applicant or its designee shall submit building plans illustrating that the proposed project's non-residential land uses shall achieve an 8% greater building energy efficiency than required by the current state energy efficiency standards in Title 24, Part 6 of the California Code of Regulations. • Use "Energy Star" rated (or greater) roofing materials. • Use both indoor and outdoor energy efficient lighting that meets or exceeds Title 24 requirements. • Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application shall show that the proposed project includes a complete solar water heating system. • Include an energy efficient heating system and an air conditioning system that exceeds the SEER ratio by a minimum of two points at the time of building permit issuance. • Only use low flow water fixtures such as low flow toilets, faucets, showers, etc. • Only use programmable thermostat timers. • Prior to approval of Improvement Plans, the applicant shall only show energy efficient lighting for all street, parking, and	

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			area lighting associated with the proposed project, including all on-site and off-site lighting. • Include pedestrian-friendly paths and cross walks in all parking lots. • Pave all parking lots with reflective coatings (albedo = 0.30 or better). This measure is considered feasible if the additional cost is less than 10% of the cost of applying a standard asphalt product. • Install EV charging stations on 1.5% of the constructed parking spaces, in addition to installing the infrastructure necessary to support future EV charging stations consistent with the 2019 California Building Code. • Maximize the amount of drought tolerant landscaping by minimizing the amount of turf in all areas where this option is feasible as well as comply with the City's Model Water Efficient Landscape Ordinance for both residential and commercial land uses. • Ensure recycling of construction debris and waste through administration by an on-site recycling coordinator and presence of recycling/separation areas.	
11-2 the project conflict with the City's Climate Action Plan?	Both Alternatives	Less than Significant	None Required	Less than Significant
Geology, Soils, and Paleontology				
12-1 Would the project result in exposure to potential substantial adverse effects involving rupture of a known earthquake fault, strong seismic ground shaking or seismic-related ground failure including liquefaction?	Both Alternatives	Less than Significant	None Required	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
12-2 Would the project be located on a geologic unit or soil that is unsuitable for the project?	Both Alternatives	Less than Significant	None Required	Less than Significant
12-3 Would the project result in substantial erosion or loss of topsoil during construction activities or following completion?	Both Alternatives	Less than Significant	None Required	Less than Significant
12-4 Would the project substantially alter existing landforms?	Both Alternatives	Less than Significant	None Required	Less than Significant
12-5 Would the project directly or indirectly destroy paleontological resources?	Both Alternatives	Potentially Significant	MM 12a: If paleontological resources are encountered during site remediation or construction, work shall be halted within 100 feet of the resource and the construction contractor must notify the City of Grass Valley Community Development Department of the resource within 24 hours. The project applicant shall retain a qualified paleontologist to evaluate and record the resource and make recommendations for the appropriate treatment of the resource, in consultation with the City. Construction workers shall not collect paleontological resources. Appropriate treatment may include collection and processing of "standard" samples by a qualified paleontologist to recover micro vertebrate fossils; preparation of significant fossils to a reasonable point of identification; and depositing significant fossils in a museum repository for permanent curation and storage, together with an itemized inventory of the specimens.	Less than Significant
12-6 Would the project make a considerable contribution to cumulative geology, soil, seismic, or paleontological impacts?	Both Alternatives	Less than Significant	None Required	Less than Significant
Hydrology and Water Quality				

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
13-1 Would the project substantially degrade surface or groundwater quality?	Both Alternatives	Less than Significant	None Required	Less than Significant
13-2 Would the project cause a substantial increase in rate or volume of runoff leaving the site that would exceed the capacity of existing or planned stormwater drainage systems and result in flooding?	Both Alternatives	Less than Significant	None Required	Less than Significant
13-3 Would the project expose people or structures to a significant hazard of flooding as a result of placing development within a 100-year flood hazard area?	Both Alternatives	Less than Significant	None Required	Less than Significant
13-4 Would the project substantially decrease groundwater recharge, resulting in depressed groundwater levels in the local and/or regional area?	Both Alternatives	No Impact	None Required	No Impact
13-5 Would project construction and operation contribute to cumulative violations of water quality standards and/or waste discharge requirements?	Both Alternatives	Less than Significant	None Required	Less than Significant
Public Utilities and Services				
14-1 Would the project result in inadequate water supply and distribution infrastructure requiring construction of new facilities?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-2 Would the project result in inadequate water supply and distribution infrastructure requiring	Both Alternatives	Less than Significant	None Required	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
construction of new facilities in the cumulative scenario?				
14-3 Would the project exceed existing treatment, collection, and disposal facilities, resulting in the need for expansion or new wastewater infrastructure?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-4 Would the project exceed existing treatment, collection, and disposal facilities, resulting in the need for expansion or new wastewater infrastructure in the cumulative condition?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-5 Would the project result in an increased demand for gas or electricity requiring new production facilities?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-6 Would the project result in an increased demand for gas or electricity requiring new production facilities in the cumulative condition?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-7 Would the project require extension of dry utility infrastructure to the site that could cause significant environmental impacts?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-8 Would the project require extension of dry utility infrastructure to the site that could cause significant environmental impacts in the cumulative condition?	Both Alternatives	No impact	None Required	No impact

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
14-9 Would the project conflict with school district ability to provide educational services or create a substantial increase in school population?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-10 Would the project conflict with school district ability to provide educational services or create a substantial increase in school population in the cumulative condition?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-11 Would the project result in an increased demand for library services?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-12 Would the project result in an increased demand for library services in the cumulative condition?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-13 Would the project result in a need to construct new or expand existing parks and facilities?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-14 Would the project result in a need to construct new or expand existing parks and facilities in the cumulative condition?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-15 Would the project result in an increased demand for fire protection and emergency services requiring new facilities or reducing overall fire protection?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-16 Would the project interfere with emergency response or evacuation or	Both Alternatives	Less than Significant	None Required	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
increased demand for fire protection and emergency services requiring new facilities or reducing overall fire protection in the cumulative condition?				
14-17 Would the project require new law enforcement facilities?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-18 Would the project interfere with the ability to provide law enforcement services?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-19 Would the project contribute to the need for new law enforcement facilities or interfere with law enforcement response in the cumulative condition?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-20 Would the project generate waste of a daily volume that cannot be accommodated by the materials recovery facility?	Both Alternatives	Less than Significant	None Required	Less than Significant
14-21 Would the project generate waste of a daily volume that cannot be accommodated by the materials recovery facility in the cumulative condition?	Both Alternatives	Less than Significant	None Required	Less than Significant
Hazards and Hazardous Materials				
15-1 Would the project create a significant hazard to the public or environment through routine transport, use, or disposal of hazardous materials?	Both Alternatives	Potentially Significant	MM 15a~~ Mitigation Measure 15a~~: The project applicant shall implement the Removal Action Workplan (RAW) as approved by the California Department of Toxic Substances Control prior to construction of the proposed project. This shall include excavation and off-site disposal for the waste in Area of Concern (AOC) 1, and on-site consolidation and burial of mine waste rock and tailings beneath the proposed	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
			commercial development in AOC 2. In AOC 1, vegetation removal must be conducted in the areas to be excavated using hand-held mechanical equipment to minimize disturbance of soil prior to excavation. In AOC 2, prior to implementation of the RAW, DTSC must review and approve site development plans showing the final development layout and waste placement details. In the event that any ground-disturbing activities would occur on the project site prior to the site remediation activities, DTSC must review the proposed ground-disturbing activities and the project proponent/construction contractor would mark remediation areas on the site so the areas may be avoided. After excavation and on-site placement, soil samples must be tested and submitted to DTSC to verify that soil conditions meet the remedial goals defined in the RAW. Throughout all activities conducted in implementation of the RAW, contractors must adhere to each component of the RAW, including, but not limited to the Site Safety Plan and the Asbestos Dust Mitigation Plan.	
15-2 Would the project create a significant hazard to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	Both Alternatives	Potentially Significant	MM 15a (see above)	Less than Significant
15-3 Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within 0.25 miles of an existing or proposed school?	Both Alternatives	No Impact	None Required	No Impact

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
15-4 Would the project be located on a site which is included on a list of hazardous materials sites, and as a result, would create a significant hazard to the public or environment?	Both Alternatives	Potentially Significant	MM 15a (see above)	Less than Significant
15-5 Would the project be 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, and as a result, would result in a safety hazard for people residing or working in the project area?	Both Alternatives	Less than Significant	None Required	Less than Significant
15-6 Would the project be located within the vicinity of a private airstrip, and would result in a safety hazard for people residing or working in the project area	Both Alternatives	Less than Significant	None Required	Less than Significant
15-7 Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Both Alternatives	Less than Significant	None Required	Less than Significant
15-8 Would the project expose people or structures to a significant risk of loss, injury, or death involving wildland fires?	Both Alternatives	No Impact	None Required	No Impact
15-9 Would the project create or expose residents to potential health hazards?	Both Alternatives	Potentially Significant	MM 15a (see above)	Less than Significant

Table ES-2
Dorsey Marketplace Draft EIR Impacts and Mitigation Summary

Impact Number and Title	Level of Significance before Mitigation		Mitigation Measures	Level of Significance after Mitigation
15-10 Would the project contribute to a significant impact regarding hazards or hazardous materials in the cumulative condition?	Both Alternatives	No Impact	None Required	No Impact
Other CEQA Considerations				
16-1 Would the project cause a temporary increase in wasteful, inefficient, and unnecessary energy consumption due to construction?	Both Alternatives	Less than Significant	None Required	Less than Significant
16-2 Would the project cause a permanent increase in wasteful, inefficient, and unnecessary energy consumption or fail to comply with state and federal energy standards?	Both Alternatives	Less than Significant	None Required	Less than Significant
16-3 Could the proposed project objectives be achieved through a feasible alternative that would substantially reduce the amount of energy required over the life of the project or through a feasible alternative that would include use of alternative fuels or energy systems?	Both Alternatives	Less than Significant	None Required	Less than Significant

TABLE OF CONTENTS

Section **Page No.**

FIGURES

No table of figures entries found.

TABLES

CHAPTER 1
INTRODUCTION

This Final Environmental Impact Report (EIR) contains the public and agency comments received in response to the Draft EIR for the Dorsey Marketplace project (proposed project) and the responses to each of those comments. Hard copies of this document also include those pages from the Draft EIR where text changes have been made in response to the comments; the full Draft EIR, including these text changes, is provided electronically on CD and also at on the City of Grass Valley's (City's) website at: http://www.cityofgrassvalley.com/dorsey-marketplace/dorsey-marketplace

The Draft EIR was circulated for public review period from March 22, 2019, through May 6, 2019. A public hearing was held at the City of Grass Valley Planning Commission on April 16, 2019, to receive comments on the Draft EIR. The comments received at the Planning Commission hearing, all written comments on the Draft EIR received by the City prior to the end of the public review period, and two comment letters on the Draft EIR that were received after the end of the public review period are addressed in this Final EIR. Direct responses to each comment received are provided in Chapter 2, Responses to Comments. Additionally, revisions to the text of the Draft EIR that are necessary to clarify the EIR content are presented in Chapter 3, Draft EIR Text Revisions. As discussed in Section 1.5, Summary of Draft EIR Text Revisions, the text revisions also include an adjustment to the project description under Alternative B that increases the number of proposed dwelling units from 171 to 172.

1.1 CEQA REQUIREMENTS

Under the California Environmental Quality Act (CEQA), the lead agency (the City) must prepare and certify a Final EIR prior to a proposed project being approved. The contents of the Final EIR are specified in the CEQA Guidelines, Section 15132, which states that the Final EIR shall consist of the following:

- The Draft EIR or a revision of the Draft EIR
- Comments and recommendations received on the Draft EIR, either verbatim or in summary
- A list of persons, organizations, and public agencies commenting on the Draft EIR
- The lead agency's responses to significant environmental points raised in the review and consultation process
- Any other information added by the lead agency

As lead agency, the City must provide each agency that commented on the Draft EIR with a copy of the lead agency's responses to those comments at least 10 days before certifying the Final EIR. The Final EIR allows commenting agencies and the public an opportunity to review revisions to the Draft EIR and the responses to comments. Overall, considering both the Draft and Final documents, this EIR serves to inform the City's consideration of the proposed project by disclosing the environmental consequences that would result if the proposed project or one of the alternatives is approved and implemented.

Additionally, Section 15207 of the CEQA Guidelines states that "if any public agency or person … fails to comment within a reasonable time as specified by the Lead Agency, it shall be assumed, without a request

for a specific extension of time, that such agency or person has no comment to make." Though not required, the City has opted to respond to the late comments received in order to address any and all concerns brought forth by the public.

1.2 CERTIFICATION OF THE FINAL ENVIRONMENTAL IMPACT REPORT

The comments and responses that make up the Final EIR, in combination with the Draft EIR and the text revisions made to the Draft EIR as indicated in this document, constitute the EIR that will be considered for certification by the City decision makers. As required by Section 15090(a)(1)–(3) of the CEQA Guidelines, in certifying a Final EIR, a lead agency must make the following three determinations:

1. The Final EIR has been completed in compliance with CEQA;
2. The Final EIR was presented to the decision-making body of the lead agency, and the decision-making body reviewed and considered the information in the Final EIR prior to approving the project; and
3. The Final EIR reflects the lead agency's independent judgment and analysis (14 California Code of Regulations (CCR) 15090(a)(1–3).

As required by CEQA Guidelines Section 15091, no public agency shall approve or carry out a project for which an EIR has been certified that identifies one or more significant environmental effects of the project unless the public agency makes one or more written findings (Findings of Fact) for each of those significant effects, accompanied by a brief explanation of the rationale for each finding, supported by substantial evidence in the record. The possible findings include:

1. Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the Final EIR.
2. Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
3. Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR (14 CCR 15091).

Additionally, pursuant to the CEQA Guidelines Section 15093(b), when a lead agency approves a project that would result in significant unavoidable impacts that are disclosed in the Final EIR, the agency must state in writing the reasons for supporting the action. The Statement of Overriding Considerations must be supported by substantial evidence in the lead agency's administrative record.

The Findings of Fact and Statement of Overriding Considerations are included in a separate document that will be considered for adoption by the City's decision makers concurrent with deliberations on the proposed project.

1.3 FINAL ENVIRONMENTAL IMPACT REPORT ORGANIZATION

This Final EIR was prepared in accordance with CEQA (California Public Resources Code, Section 21000 et seq.). It includes the following content:

- **Introduction (Chapter 1)** – Includes a brief procedural history and summary of CEQA requirements, a summary of how the document is organized, a list of the agency and public comments received on the Draft EIR (Table 1-1), and a summary of text revisions made to the Draft EIR (Table 1-2).
- **Responses to Comments (Chapter 2)** – Provides responses to all comments received on the Draft EIR. The responses clarify, correct, and/or amplify text in the Draft EIR, as appropriate.
- **Draft EIR Text Revisions (Chapter 3)** – Presents the text changes made to the Draft EIR either in response to comments or at the initiative of the City to correct, clarify, and amplify the EIR descriptions, analysis, and conclusions. These changes are shown in strikeout/underline format. The revisions to the Draft EIR text do not alter the conclusions of the Draft EIR and no significant new information has been added. Hard copies of this document include only those pages from the Draft EIR where text changes have been made. The text changes have been incorporated in the full Draft EIR, included in CD copies of this document and available at on the City of Grass Valley's website at: http://www.cityofgrassvalley.com/dorsey-marketplace/dorsey-marketplace

1.4 RESPONSE TO COMMENTS

A total of 20 comment letters were received and each letter and response is included in Chapter 2, Responses to Comments. Each comment letter is numbered and presented with brackets indicating how the letter has been divided into individual comments. Each comment is given a binomial with the number of the comment letter appearing first, followed by the comment number. For example, comments from Letter A are numbered A-1, A-2, A-3, and so on. Immediately following the letters are the responses, each with binomials that correspond to the bracketed comments.

The focus of the responses to comments is on the disposition of significant environmental issues raised in the comments, as specified by Section 15088(c) of the CEQA Guidelines. Comments have been reviewed, analyzed, and evaluated, and substantive comments on the Draft EIR are addressed in the given a response. When a comment is not directed to significant environmental issues and does not raise specific issues related to the adequacy of the environmental analysis, the response indicates that no further response is necessary.

Table 1-1
Index of Commenters on the Draft Environmental Impact Report

Comment Letter	Date of Letter	Commenter
A	May 7, 2019	California Governor's Office of Planning and research, State Clearinghouse
B	May 6, 2019	California Department of Transportation (Caltrans)

Table 1-1
Index of Commenters on the Draft Environmental Impact Report

Comment Letter	Date of Letter	Commenter
C	April 10, 2019	Native American Heritage Commission
D	May 2, 2019	Central Valley Regional Water Quality Control Board
E	May 2, 2019	Nevada County Department of Public Works
F	May 1, 2019	Nevada Irrigation District
G	April 28, 2019	California Native Plant Society, Redbud Chapter
H	April 26, 2019	Grass Valley Chamber of Commerce (Joy Porter)
I	April 26, 2019	Grass Valley Chamber of Commerce, Community Affairs Committee (Jon Katis)
J	May 6, 2019	Protect CEQA
K	May 6, 2019	Community Environmental Advocates (Silberstein etc)
L	May 6, 2019	Community Environmental Advocates (Rivenes)
M	May 7, 2019	Tom Ivy, Grass Valley Planning Commissioner
N	April 29, 2019	Janis Berger
O	April 30, 2019	John Rumsey
P	May 2, 2019	Debbie Gibbs
Q	May 6, 2019	Warren Hughes, Gallelli Real Estate
R	June 3 ,2019	Patrick Soluri/Soluri Meserve, on behalf of Protect CEQA
S	June 24, 2019	Scott Cashen, on behalf of Protect CEQA
T	April 16, 2019	Public comments received at the Planning Commission

1.5 SUMMARY OF DRAFT EIR TEXT REVISIONS

Table 1-2 identifies all revisions made to the Draft EIR and its appendices. These text revisions include an adjustment to the project description under Alternative B as well as text added in support of the responses to comments received on the Draft EIR, such as additional description of existing conditions, updates to regulatory framework, clarification of project impacts, and refinements to mitigation measures. The adjustment to Alternative B reflects that the site plan anticipates 172 multi-family dwelling units rather than the 171 units as previously identified. Text was revised throughout Draft EIR chapters 4 through 17 as necessary to ensure that the environmental impact analysis reflects this change. The text revisions related to the Alternative B adjustment and those provided in support of responses to comments do not change the conclusions presented in the Draft EIR regarding the significance of the proposed project's environmental impacts. Further, the text revisions do not introduce any new information that results in the public having been deprived of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect. The pages from the Draft EIR on which text revisions were made are included in this Final EIR (Chapter 3).

Table 1-2
Summary of Draft Environmental Impact Report Text Revisions

Revised Draft EIR Page Number(s)	Text Revision Made
ES-2	Text revised to clarify aquatic features onsite
ES-5	Text revised to clarify potential use of pads with drive-through lanes Correction of number of dwelling units in Alternative B
ES-7	Correction of spelling/syntax error
ES-8	Rows added to Table ES-1 showing that the project would be required to obtain a Streambed Alteration Agreement and a Waste Discharge Requirement permit
ES-12 through ES-19	Refinements of Mitigation Measures 6a, 6b, 6c, 6e and 6f
ES-22 through ES-25	Refinements of Mitigation Measures 8a, 8b, 8c, 8d, 8e, and 8g
ES-27	Refinement of Mitigation Measure 9d
ES-28 through ES-30	Refinement of Mitigation Measure 10a
ES-31 through ES-33	Refinement of Mitigation Measure 11a
ES-38	Correction of typographical error
2-1	Correction of number of dwelling units in Alternative B
2-7 and 2-8	Correction to description of pads with drive-through lanes, correction to requirements related to electric vehicle charging
2-10 and 2-11	Corrections of number of dwelling units in Alternative B, description of pads with drive-through lanes, and requirements related to electric vehicle charging
2-13	Correction of number of dwelling units in Alternative B shown in Table 2-1
2-14	Correction to description of pads with drive-through lanes
3-1, 3-2, 3-15, 3-16, 3-17	Correction of number of dwelling units in Alternative B
4-1	Correction of number of dwelling units in Alternative B
4-5	Update housing needs allocation numbers to reflect recently-adopted Housing Element
4-8	Addition of text specifying the jobs:housing ratio under Alternative A; correction of number of dwelling units in Alternative B and associated population
4-9	Addition of text specifying the jobs:housing ratio under Alternative B; correction of number of dwelling units in Alternative B
4-10 through 4-13	Update housing needs allocation numbers to reflect recently-adopted Housing Element Correction of number of dwelling units in Alternative B and associated population
5-3	Text added to description of Key Viewpoint 3
5-6 and 5-7	Addition of text elaborating on Design Guidelines
5-9 and 5-11	Addition of text discussing impacts to ridgeline views available in the background of the project site
6-1	Correction of number of dwelling units in Alternative B

Table 1-2
Summary of Draft Environmental Impact Report Text Revisions

Revised Draft EIR Page Number(s)	Text Revision Made
6-4 and 6-6	Text added to identify the July 2016 site survey and results
6-7 and 6-8	Text added to clarify the potential for Stebbins' morning-glory, Follett's monardella, and sierra blue grass to occur onsite
6-8	Text added to clarify the survey findings regarding potential presence of Blainville's horned lizard
6-9 and 6-10	Text added to provide additional information regarding aquatic features and their jurisdictional status
6-14 and 6-15	Text regarding ranking of special-status plant species revised to match current nomenclature
6-16 and 6-18	Text added referencing field surveys completed in July 2016 Text revised to clarify potential presence of special-status species at the site
6-19	Text added to clarify potential impacts during soil remediation
6-21	Text added to clarify performance standard in Mitigation Measure 6e
6-21 and 6-22	Text added regarding the potential impacts to waters of the United States and waters of the state, and the requirement for a Clean Water Act Section 401 permit Text revised to clarify that the 0.077 acres of drainage is subject to both RWQCB and CDFW jurisdiction in addition to Army corps of Engineers and that the 0.065 acres of wetlands and waters of the United States are also considered waters of the state and fall within the jurisdiction of the RWQCB
6-24 and 6-25	Text added to elaborate on cumulative impacts to biological resources
6-25 through 6-31	Clarifications to Mitigation Measures 6a, 6b, 6c, 6e and 6f
7-16	Corrections to the process of identifying a "most likely descendant" in the event of an accidental discovery of human remains
8-1 and 8-2	Correction to number of dwelling units in Alternative B and addition of text discussing this change
8-9	Addition of text identifying the Western Nevada County Regional Transportation Mitigation fee
8-10	Edit reflecting that Nevada County Transportation Commission (NCTC) was first introduced on the prior page Addition of text identifying the City of Grass Valley Traffic Impact Fee
8-13 and 8-14	Correction of table labels (Tables 8-4 and 8-5) Correction to number of dwelling units in Alternative B and associated trip generation (Table 8-5), addition of text describing the increased trip generation
8-16	Correction to data in Table 8-6 regarding the density of vehicles on the Dorsey to Idaho Maryland SB weave
8-17	Correction to number of dwelling units in Alternative B

Table 1-2

Summary of Draft Environmental Impact Report Text Revisions

Revised Draft EIR Page Number(s)	Text Revision Made
8-21	Addition of text to clarify requirement in Mitigation Measure 8a regarding construction of the concrete barrier at Idaho Maryland Road/Brunswick Road Clarification of impact and mitigation at Idaho Maryland Road/SR 20/49 Northbound Ramps
8-23	Correction of table label (Table 8-9)
8-25	Clarification of requirement in Mitigation Measure 8a regarding construction of the concrete barrier at Idaho Maryland Road/Brunswick Road
8-31 and 8-32	Elaboration and clarification of requirements for Alternative A in Mitigation Measures 8a, 8b, 8c, 8d, 8e, and 8g
8-33	Addition of text clarifying impact due to queueing at the Dorsey Drive/SR 20/49 Southbound Ramp/Joerschke Drive intersection under Alternative A
8-37 and 8-38	Elaboration and clarification of requirements for Alternative A in Mitigation Measures 8a, 8b and 8e
8-41 through 8-43	Clarifications to Mitigation Measures 8a, 8b, 8c, 8d, 8e, and 8g Addition of two new cited references
9-1	Correction of number of dwelling units in Alternative B Correction of name of the noise technical appendix
9-7	Correction of traffic volumes on SR 20/49 (Table 9-5)
9-23	Clarify discussion of maximum and average construction noise levels Elaborate on requirements of Mitigation Measure 9d
9-25 and 9-26	Add text to Mitigation Measure 9d to clarify requirements for construction noise control measures
9-27	Addition of reference cited
10-1	Correction of number of dwelling units in Alternative B
10-6	Addition of text clarifying potential presence of naturally occurring asbestos
10-8	Addition of text regarding state regulations for construction in the presence of naturally occurring asbestos
10-16	Correction of number of dwelling units in Alternative B and associated population
10-28 and 10-29	Addition of text amplifying conclusion that construction emissions would not create significant adverse health effects Correction of text regarding requirement to implement Asbestos Dust Mitigation Plan
10-31 and 10-32	Elaboration of construction emission control measures in Mitigation Measure 10a
11-1	Correction of number of dwelling units in Alternative B
11-5	Update information regarding greenhouse gas emissions in the U.S.

Table 1-2
Summary of Draft Environmental Impact Report Text Revisions

Revised Draft EIR Page Number(s)	Text Revision Made
11-27	Addition of information regarding the Grass Valley Energy Action Plan
11-30	Text added to document the reduction in energy consumption and associated greenhouse gas emissions from compliance with the 2019 California Building Code and the requirement added to Mitigation Measure 11a for the project applicant to install electric vehicle charging stations
11-31 through 11-34	Rows added to Tables 11-3 and 11-5 and explanatory text added to reflect reduction in greenhouse gas emissions due to compliance with the 2019 building code and installation of electric vehicle charging stations
11-34	Text added regarding the Grass Valley Energy Action Plan
11-36 through 11-38	Text added to Mitigation Measure 11a to amplify requirements related to reducing greenhouse gas emissions
11-40 and 11-42	Addition of references cited
13-1	Correction of number of dwelling units in Alternative B
13-7	Correction of reference to State Antidegradation Policy
13-9 through 13-11	Text added referencing the regulatory permit requirements for impacts to waters of the US and waters of the state Text added to refer to grading and excavation associated with soil remediation in description of activities with potential to adversely affect water quality
13-15	Correction regarding the water supplier for the project site
14-1 and 14-2	Text revisions clarifying service areas for the water suppliers in the project region Correction of the number of water treatment plants and water usage rates reduction
14-2 through 14-4	Text added and Tables 14-1 and 14-2 revised to provide additional information regarding water supply in normal and dry years Text added describing water shortage contingency planning
14-24	Updates to Table 14-5 and 14-6 reflecting corrected number of dwelling units in Alternative B
14-29 through 14-31	Text added to provide additional information regarding water supply in dry years, water shortage management, and other details of the NID UWMP
14-37	Updates to student generation under Alternative B reflecting corrected number of dwelling units.
14-38	Updates to demand for library space under Alternative B reflecting corrected number of dwelling units.
14-40	Updates to demand for parkland under Alternative B reflecting corrected number of dwelling units.
14-41	Updates to number of dwelling units and associated residential population under Alternative B n in discussion of demand for fire department services

Table 1-2

Summary of Draft Environmental Impact Report Text Revisions

Revised Draft EIR Page Number(s)	Text Revision Made
14-43	Updates to number of dwelling units and associated residential population under Alternative B in discussion of demand for law enforcement services
14-45	Updates and corrections to analysis of solid waste generation
14-47	Addition of new cited reference
15-25	Addition of text to cumulative impact discussion regarding potential for cumulative airborne emission impacts
16-1, 16-2, 16-14	Correction of number of dwelling units in Alternative B
17-9 and 17-13	Correction of number of dwelling units in Alternative B

* Page numbering shown on PDFs in Chapter 3, Text Changes to the Draft Environmental Impact Report.

R-24 The comment states that the City must take responsibility for implementing the Wastewater Master Plan if the City believes that the plan will address the wastewater impact; this would ensure that mitigation for the project's impacts is enforceable. Additionally, if the proposed project is not required to pay a fair-share contribution towards the improvements, the comment states that the City must disclose this and it may constitute an unlawful gift of public funds.

The proposed project would be required to pay development connection fees which would contribute to the implementation of the City's Wastewater Master Plan. The City has adopted the Wastewater Master Plan and committed to implementing it. The City's CIP includes specific projects from the Wastewater Master Plan, and the plan is regularly updated to reflect existing and projected conditions,

R-25 The comment states that the proposed project would exacerbate traffic on SR 20/49 which will in turn, expose the future residents to noise impacts, which is a necessary consideration as a result of the 2015 CBIA v BAAQMD decision. The comment states that the Draft EIR misrepresents the amount of traffic on SR 20/49 because Table 9-5 states that the average daily traffic in 2016 was 29,350 when Caltrans identifies it as 41,000. The comment then states that the 2035 traffic volumes were underestimated by assuming the exact same volume and the Draft EIR does not provide any explanation for assuming no increase in traffic volume over 30 years. The comment states that these issues would need to be addressed and the Draft EIR revised and recirculated.

The traffic volume cited in Draft EIR Table 9-5 shows the traffic volume for State Route 49 as reported in the Caltrans 2016 Traffic Volumes (Caltrans 2016). However, the comment is correct that the more appropriate volume to use for this analysis is the volume given for State Route 20, which shows 41,000 daily vehicles on the segment of freeway between Idaho-Maryland Road and Dorsey Drive. Table 9-5 has been updated as shown in Chapter 3, Draft EIR Text Revisions. This change does not affect the impact analysis, significance determination, or mitigation measures because the noise level associated with the freeway was not determined based on the reported volume. As shown in Table 9-3, one of the short-term noise measurement locations was located in the southwestern corner of the project site, approximately 80 feet from the edge of SR 20/49. Thus the noise level associated with existing traffic volumes was measured directly. The noise measurement data was then used in the noise modeling to determine noise levels at the proposed noise-sensitive land uses. As shown in Table 9-10, the anticipated noise level at the proposed residences nearest SR 20/49 under Alternative B would be 61 dBA.

Modeling for the cumulative scenario was based on the projected traffic volumes presented in the TIAR, which reports peak hour volumes rather than Average Daily Trips. Comparison of the peak hour traffic volumes at intersections 7 and 8, which are the Dorsey Drive intersections with the SR 20/49 on- and off-ramps, shows that traffic using the on- and off-ramps on the southbound side of the highway would increase by 45.5% by year 2035, while traffic using the on- and off-ramps on the northbound side of the highway would increase by 33.4%. This increase is reflected in the noise modeling results. Caltrans has found that vehicle noise levels increase with increases in traffic volume, but it takes a doubling of traffic to increase noise

levels by only 3 dB (Caltrans 2009). Thus the analysis in Impact 9-5 correctly states that noise levels adjacent to SR 20/49 are not expected to increase substantially in the cumulative scenario.

R-26 The comment states that the Draft EIR fails to properly characterize roadway noise and fails to demonstrate that it identified proper receiver locations. The comment quotes from Chapter 9 of the Draft EIR and states that the noise measurement locations are never described as nearest residential units to the roadway and that unless the "representative residential receiver locations" are those nearest the roadway, the noise impacts may be understated.

As shown in Tables 9-3 and 9-4, there were five locations where noise level measurements were taken. The three short-term measurement locations are identified as being 10 feet from the edge of Spring Hill Drive, 9 feet from the edge of Dorsey Drive, and 80 feet from the edge of SR 20/49. The measured noise data from the short-term and long-term measurement locations was used to model the anticipated future noise conditions at eight locations within and in the vicinity of the project site. In addition to the measured noise data, the modeling considers site-specific factors for each of the modeled receiver locations, including projected changes in traffic conditions, topography, landscaping, and building type, size, and orientation. Thus the noise analysis appropriately reflects the potential noise exposure for proposed residential units nearest to SR 20/49.

R-27 The comment states that the Draft EIR was misleading regarding construction noise because the Draft EIR states that the nearest receptor is 30 feet from operations but Table 9-13 provides noise levels beginning at 50 feet and because the Draft EIR analyzes the average noise rather than the most severe noise levels.

Table 9-13 provides a noise reference table from the Department of Transportation that illustrates the typical maximum noise levels for various pieces of construction equipment to give real world context to understand the noise levels of the typical construction equipment. This is a commonly-used data source in CEQA compliance documents and is included to provide information and context for the noise impact analysis. It is not included in an attempt to minimize noise impacts. The Draft EIR includes the construction noise data necessary to fully understand the project's impacts: Table 9-15 provides a comparison between the nearest receiver (30 feet) and the typical receiver (100 feet), showing that homes nearest the proposed construction would be subject to greater noise intrusion. As discussed in Impact 9-4, the FHWA RCNM construction noise model was used to provide both the worst case scenario (30 feet for the nearest receptor) and the typical scenario (100 feet).

R-28 The comment states that the use of average noise levels in misleading as the nearest sensitive receptors may be exposed to noise levels exceeding 90 dB, which would cause adverse human health impacts.

The analysis reflects the noise exposure at both the nearest receiver (30 feet) and the typical receiver (100 feet). There would be two stages of construction at which the nearest receptors may be exposed to more than 90 dBA: grading/utilities and building construction. The text in the

Draft EIR referring to the average construction noise levels has been edited to also recognize the maximum noise levels for the nearest residences.

The Draft EIR does not state or imply that exposure to more than 90 dB of noise results in human health impacts. Rather, Table 9-2, which lists examples of noise levels for common noise sources, shows that operation of a gas lawn mower creates a noise level of 90 dB measured three feet from the mower. This demonstrates that limited exposure to sound levels of 90 dB does not cause significant adverse health effects.

Under the City's noise ordinance, construction is restricted to the hours of 7am and 7pm and between Monday and Saturday. While the Noise Ordinance does not identify a maximum dBA limit for construction, the Draft EIR states that anticipated construction noise levels exceed the City's standards for daytime ambient noise from a fixed noise source (as shown in Table 9-8) and thus represent a potentially significant impact; however the analysis also notes that construction noise is temporary and fluctuating, thus strict application of the City's ambient noise standards (which are applied to permanent noise sources) is not the appropriate threshold of significance. Mitigation Measure 9d requires that typical noise control measures be implemented throughout construction, including locating all stationary noise-generating construction equipment as far as practical from nearby homes and providing acoustic shielding when this equipment must be located near existing residences, as well as time of day restrictions, requiring appropriate maintenance of construction equipment, and requirements for limited operation and idling of all equipment and vehicles.

R-29 The comment states that the Draft EIR defers mitigation for noise impacts and fails to disclose the effectiveness of the proposed mitigation. Specifically, the comment states that Mitigation Measure 9d does not identify what is meant by "as far as practical from nearby homes" or "acoustical shielding."

The intent of the construction noise mitigation is not to ensure that adjacent residences would not be exposed to noise levels that exceed the City's community noise level standards of 55 dBA. Rather it is to minimize the potential for annoyance and avoid adverse health effects. As stated on Draft EIR page 9-2, physical effects to humans (discomfort or pain in the ear, hearing loss) typically begin to occur at noise levels of at least 120 dB. There is no definitive limit at which non-physical human effects can occur because "the response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, the type of activity during which the noise occurs, and the sensitivity of the individual" (Draft EIR page 9-1). Mitigation Measure 9d has been modified to provide more specific details regarding the location of stationary construction equipment and acoustical shielding.

R-30 The comment states that the City cannot rely on City Code to assert that there is no significance standard applicable to construction noise because there is other evidence that shows that the noise impact might be significant.

As discussed above in Response to Comment R-27, while the City Code does not consider construction noise between Monday and Saturday and between the hours of 7 am and 7pm to be in violation of the Noise Ordinance, the analysis still considered the anticipated construction noise to be significant. As a point of reference, the Draft EIR compares the construction noise to the City's community noise level standards, but it is important to understand that the community noise level standards were established to regulate the permanent noise sources and conditions in the City and are not intended to be applied to construction noise. Rather, the EIR considers the potential for construction noise to cause adverse human health impacts, including substantial annoyance and disruption of typical activities at adjacent noise-sensitive land uses, as discussed in Response to Comment R-29. Therefore, the EIR is not using the City Code as a way to avoid analysis of the potential impact.

R-31 The comment provides conclusory statements, reiterating that the Draft EIR is inadequate.

The comment does not identify specific inaccuracies or inadequacies in the EIR. Direct responses to each of the specific comments presented in this comment letter are provided above.

References Cited

Caltrans (California Department of Transportation). 2009. Technical Noise Supplement. November 2009.

Caltrans. 2013. 2013 Annual Average Daily Truck Traffic on the California State Highway System. 2013.

Caltrans. 2016. 2016 Traffic Volumes on California State Highways. 2016.

CARB (California Air Resources Board). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. April 2005.

CARB. 2017a. Technical Advisory Strategies to Reduce Air Pollution Exposure (report). April 2017.

CARB. 2017b. Technical Advisory Strategies to Reduce Air Pollution Exposure (fact sheet). April 24, 2017.

Grass Valley, City of. 2016. City of Grass Valley City Council Agenda Action Sheet for Council Meeting Date October 11, 2016. October 2016.

Grass Valley, City of. 2019. Planning Commission Staff Report. April 2, 2019.

Nevada County Transportation Commission. 2019. Western Nevada County Regional Transportation Mitigation Fee.

SMAQMD. 2015. SMAQMD Thresholds of Significance Table. May 28, 2015.

SMAQMD. 2019. Basic Construction Emission Control Practices (Best Management Practices). July 2019.

Comment Letter S

Scott Cashen, M.S.—Independent Biological Resources Consultant

June 24, 2019

Mr. Patrick M. Soluri
Soluri Meserve
510 8th Street
Sacramento, CA 95814

Subject: Comments on the Draft Environmental Impact Report for the Dorsey Marketplace Project

Dear Mr. Soluri:

This letter contains my comments on the Draft Environmental Impact Report ("DEIR") prepared by the City of Grass Valley ("City") for the Dorsey Marketplace Project ("Project"). The Project proponent ("Applicant") proposes commercial and residential development on a 26.8-acres parcel of land located south of Dorsey Drive and east of State Route 20/49 in the City of Grass Valley, California.

I am an environmental biologist with 26 years of professional experience in wildlife ecology and natural resources management. I have served as a biological resources expert for over 125 projects in California. My experience and scope of work in this regard has included assisting various clients with evaluations of biological resource issues, reviewing environmental compliance documents prepared pursuant to the California Environmental Quality Act ("CEQA") and the National Environmental Policy Act ("NEPA"), and submitting written comments in response to CEQA and NEPA documents. My work has included the preparation of written and oral testimony for the California Energy Commission, California Public Utilities Commission, and Federal courts. My educational background includes a B.S. in Resource Management from the University of California at Berkeley, and a M.S. in Wildlife and Fisheries Science from the Pennsylvania State University. A true and correct copy of my current curriculum vitae is attached hereto.

The comments herein are based on my review of the environmental documents prepared for the Project, a review of scientific literature pertaining to biological resources known to occur in the Project area, consultations with other biological resource experts, and the knowledge and experience I have acquired during my 26-year career in the field of natural resources management.

S-1

3264 Hudson Avenue, Walnut Creek, CA 94597

ENVIRONMENTAL SETTING

Special-Status Species with Potential to Occur at the Project Site

According to the DEIR:

> The potential occurrence of special-status plant and animal species on the project site was initially evaluated by developing a list of special-status species that are known or have the potential to occur in the project vicinity. This list was derived from a review of the CDFW's California Natural Diversity Database (CNDDB), the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants, and the U.S. Fish and Wildlife Service (USFWS) lists of federal endangered and threatened species for the following USGS 7.5-minute quadrangles: Grass Valley, French Corral, Nevada City, North Bloomfield, Chicago Park, Rough and Ready, Wolf, Lake Combie and Colfax (Appendix E).[1]

S-2

This conflicts with information provided in the Biological Technical Report (i.e., Appendix E). The Biological Technical Report ("BTR") indicates the special-status species list was conducted by reviewing species associated with the following quadrangles: Redwood Point, Newark, Niles, Milpitas, Mountain View, Palo Alto, Mindego Hill, Cupertino, and San Jose West.[2] These quadrangles cover land in the San Francisco Bay Area. The BTR's list of special-status species applies to those (incorrect) quadrangles. Indeed, all of the appendices in the BTR apply to an unrelated project in the San Francisco Bay Area. These include: Appendix A (*Representative Photos*), Appendix B (*Plant Species Observed*), and Appendix C (*Special-status Species Potential to Occur*). This is a significant error that adversely affects the public's ability to evaluate the environmental impacts associated with the Project. As a result, the City must provide the public with the correct appendices and recirculate the DEIR.

Special-Status Bats

The Project site contains abandoned mine features,[3] including: "[a]n apparent shaft, approximately 10 to 15 feet wide and open to a depth of 15 feet or greater."[4] In addition, the Project site contains mature trees and rock outcrops.[5] These features provide potential habitat for special-status bat species,[6] including the Townsend's big-eared bat, pallid bat, hoary bat, silver-haired bat, Yuma myotis, long-eared myotis, long-legged myotis, and fringed myotis.[7]

S-3

[1] DEIR, p. 6-6.
[2] BTR, p. 17.
[3] DEIR, p. 2-2.
[4] DEIR, Appendix J-1. p. 4.
[5] *Ibid*, p. 1. *See also*, DEIR, Appendix E (Biological Technical Report). p. 16.
[6] *See* California Department of Fish and Wildlife, California Natural Diversity Database. 2018 Nov. Special Animals List. Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline>.
[7] California Natural Diversity Database. 2019 Jun 4. RareFind 5. California Department of Fish and Wildlife. *See also* Western Bat Working Group. 2005 (Update). Species Accounts. Available at: <http://wbwg.org/western-bat-species/>. *See also* State of California, Department of Parks and Recreation. 2009 Jan. Addendum and Final Initial Study and Mitigated Negative Declaration: Osborne Hill Trail Network Project. p. 29.

2

The availability of suitable roost sites is the limiting factor for most bat populations.[8] Of the bat species that have the potential to occur at the Project site, all but the hoary bat form nursery colonies.[9] These nursery colonies (roosts) can contain hundreds or thousands of individuals.[10] As a result, the loss of a roost site can have relatively severe implications on the overall population. Moreover, a single disturbance event can lead to roost abandonment, and if poorly timed, mass mortality of pups.[11]

The DEIR and BTR fail to discuss and analyze the potential for special-status bats to occur at the Project site. As a result, and because the DEIR does not incorporate mitigation, potentially significant impacts to special-status bats remain unmitigated.

S-3 Cont.

Special-Status Plants

According to the DEIR:

> Based on review of the databases and other information sources 11 special-status plant species have the potential to occur on or in the vicinity of the project site. Of these, four were removed from consideration due to lack of suitable habitat within or adjacent to the project area, or the project site is outside of the species' known range (Appendix E). Four special-status plant species have low potential to occur on the project site due to lack of appropriate soil substrates or habitats on site (Appendix E).[12]

These conclusions cannot be validated, because the BTR's evaluation of potentially occurring species applies to a project in the Bay Area.[13] Thus, neither the BTR nor DEIR provides the rationale for removing four species from consideration, and for concluding that four additional species have only "low potential" to occur at the Project site. This issue is confounded by discrepancies within and between the BTR and DEIR. For example, the BTR states: "[t]hree special-status plant species have moderate potential to occur at the project site. These include Stebbins' morning-glory (*Calystegia stebbinsii*), Follett's monardella (*Monardella follettii*), and Sierra blue grass (*Poa sierrae*). These species are discussed further in Table 2 and in the following section."[14] However, Table 2 in the BTR omits Follett's monardella, and instead lists dubious pea (*Lathyrus sulphureus* var. *argillaceus*) as a potentially occurring species. Whereas Table 6-2 in the DEIR lists Follett's monardella as a potentially occurring species, it omits dubious pea. These inconsistencies make it difficult for the public to understand the special-status plant species that have potential to occur at the Project site, and similarly, whether the DEIR's conclusions regarding species with potential to occur at the Project site are accurate.

S-4

[8] Western Bat Working Group. 2005 (Update). Species Accounts. Available at: <http://wbwg.org/western-bat-species/>. *See also* California Department of Fish and Wildlife. 2014. California Interagency Wildlife Task Group. CWHR version 9.0 personal computer program. Sacramento, CA.
[9] *Ibid.*
[10] *Ibid.*
[11] *Ibid.*
[12] DEIR, p. 6-6.
[13] BTR, Appendix C.
[14] BTR, pp. 17 and 18.

The DEIR's analysis of impacts to special-status plants ignores plants with a California Rare Plant Rank ("CRPR") of 3 or 4 (which is equivalent to the "CNPS List" referenced in the DEIR).[15] According to the DEIR:

> Plants on the CNPS List 1A, 1B, or 2 are generally considered to meet the criteria for endangered, threatened, or rare species as outlined by Section 15380 of the CEQA Guidelines. These plants also meet the definition of Section 1901, Chapter 10 (Native Plant Protection Act) and Sections 2062 and 2067 (CESA) of the California Fish and Game Code. Plants on the CNPS List 3 or 4 do not meet these criteria or definitions.[16]

The DEIR is incorrect. According to the California Department of Fish and Wildlife ("CDFW"): S-5

> CRPR 3 plants (plants about which more information is needed) and CRPR 4 plants (plants of limited distribution) may warrant consideration under CEQA Guidelines section 15380. Impacts to CRPR 3 plants may warrant consideration under CEQA if sufficient information is available to assess potential impacts to such plants. Impacts to CRPR 4 plants may warrant consideration under CEQA if cumulative impacts to such plants are significant enough to affect their overall rarity. Data on CRPR 3 and 4 plants should be submitted to CNDDB. Such data aids in determining and revising the CRPR of plants.[17]

Although the BTR identified dubious pea as a special-status plant that may occur at the Project site, the DEIR omitted it from CEQA analysis. Dubious pea has a CRPR of 3. However, it has a Heritage Rank of G5T1T2/S1S2.[18,19] This indicates the plant's status is somewhere between "Imperiled" or "Critically Imperiled" in California and globally.[20] *Imperiled* plants are: "At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors."[21] *Critically Imperiled* plants are: "At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors."[22] As a result, dubious pea warrants consideration under CEQA Guidelines section 15380. S-6

The Project site contains 6.6 acres of ponderosa pine forest. During Dudek's site visit, herbaceous vegetation in this community was sparse and consisted primarily of an "unidentifiable lily."[23] Humboldt lily (*Lilium humboldtii* ssp. *humboldtii*) is a CRPR 4 plant that S-7

[15] In 2010, the California Department of Fish and Game changed the name of "CNPS List" to "California Rare Plant Rank" (or "CRPR").
[16] DEIR, p. 6-14.
[17] California Department of Fish and Wildlife. 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. p. 3.
[18] California Department of Fish and Wildlife, California Natural Diversity Database. 2019 Mar. Special Vascular Plants, Bryophytes, and Lichens List. Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109383&inline>
[19] All Heritage Programs, such as the California Natural Diversity Database (CNDDB) use the same ranking methodology, originally developed by The Nature Conservancy and now maintained and recently revised by NatureServe. It includes a Global rank (G rank), describing the rank for a given taxon over its entire distribution and a State rank (S rank), describing the rank for the taxon over its state distribution. For subspecies and varieties, there is also a "T" rank describing the global rank for the subspecies.
[20] *See* California Department of Fish and Wildlife, California Natural Diversity Database. 2019 Mar. Special Vascular Plants, Bryophytes, and Lichens List.
[21] *Ibid.*
[22] *Ibid.*
[23] DEIR, p. 6-4.

is associated with Lower Montane Coniferous Forest communities in Nevada County.[24] Because the Applicant's consultant (Dudek) did not identify the lily to the taxonomic level necessary to determine rarity and listing status, the City must assume presence of Humboldt lily, and it must analyze cumulative impacts to that species.

S-7 Cont.

The DEIR's Analysis of Impacts to Special-Status Plants Violates CEQA

As reported by CDFW, botanical surveys that adhere to CDFW's survey protocols are designed to help meet CEQA requirements for adequate disclosure of potential impacts to plants and sensitive natural communities.[25] Protocol-level botanical surveys were not conducted at the Project site. For example, the DEIR acknowledges that Dudek's site survey: "was conducted at a time when special-status plants would not be evident and identifiable."[26] As a result, the City and the public can only speculate on the special-status plant species that may occur at the Project site. Furthermore, without knowledge of the specific special-status species that occur at the site (and the abundance of those species), the City can only speculate about Project impacts to special-status plants and the ability of the proposed mitigation to reduce impacts to less-than-significant levels. This approach violates CEQA because it precludes the public from understanding the nature and magnitude of the Project's impacts on special-status plants.[27]

S-8

For example, both the DEIR and BTR conclude that Stebbins' morning-glory may occur at the Project site.[28] However, neither document discusses the relative severity of Project impacts to Stebbins' morning-glory should it occur at the Project site. Stebbins' morning-glory (state and federally listed as endangered) is an exceptionally rare plant that is limited to gabbro and serpentine-derived soils in El Dorado and Nevada counties.[29] There are only 15 documented occurrences of the species, four of which have been extirpated.[30] If Stebbins' morning-glory occurs at the Project site, Project impacts to the species would be extremely significant, and most likely be unmitigable. Therefore, the City must conduct appropriately-time (protocol-level) botanical surveys[31] and provide the results in a recirculated DEIR so the public: (a) understands the magnitude and severity of Project impacts to Stebbins' morning-glory (and other special-status plants), and (b) can meaningfully participate in the CEQA review process.

Special-Status Animals

S-9

According to the DEIR: "Dudek staff biologist Laura Burris conducted a survey of the project site for special-status animal species. Survey techniques included binocular surveys of the

[24] California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 21 June 2019].
[25] California Department of Fish and Wildlife. 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. p. 1.
[26] DEIR, p. 6-6.
[27] Sierra Club v. County of Fresno (2018) 6 Cal.5th 502.
[28] DEIR, Table 6-2. *See also* BTR, Table 2.
[29] U.S. Fish and Wildlife Service. 2002. Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills. Portland, Oregon. xiii + 220 pp.
[30] California Natural Diversity Database. 2019 Jun 4. RareFind 5. California Department of Fish and Wildlife.
[31] California Department of Fish and Wildlife. 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities.

property and perimeter, identification of potential habitat on site for special-status species and identification of wildlife based on sight, calls, tracks, scat or other signs."[32] This information is misleading to the public. The BTR concluded that two special-status animal species have the potential to occur at the Project site: Blainville's horned lizard and northern goshawk.[33] Blainville's horned lizards are notoriously difficult to detect due to their cryptic coloration and behavior (which includes extended periods of time buried in sand).[34] Similarly, breeding goshawks are typically secretive and nest sites are often difficult to locate.[35] As a result, specialized techniques are generally required to identify presence of these two species.[36] Dudek did not conduct those techniques.

S-9 Cont.

Aquatic Habitats and Jurisdictional Wetlands

The DEIR provides the following description of aquatic habitats and jurisdictional wetlands at the Project site:

> Aquatic features on site include numerous erosional channels and one depression located at the southwestern end of the project site (Figure 6-2). Based on historical aerial photos and visual inspection during the site visit, the Biological Technical Report completed for the project concluded that these features are only periodically inundated and tend to remain inundated for short periods, depending on frequency and duration of rainfall events. However, the intermittent drainage in the southwestern portion of the site ties into an existing City of Grass Valley storm drain, which outfalls to Wolf Creek. Because the intermittent drainage is hydrologically connected to a waters of the United States, this feature is also likely to fall within the jurisdiction of the ACOE as a waters of the United States (Appendix E).[37]

S-10

This information is insufficient for several reasons:

First, the information provided in the DEIR is confusing. The BTR identified four potentially jurisdictional features on the Project site: (1) a cement-lined drainage, (2) an ephemeral drainage, (3) an intermittent drainage, and (4) a seasonal wetland.[38] The BTR states the intermittent drainage and seasonal wetland may be jurisdictional due to connectivity with Wolf Creek.[39] However, the DEIR only addresses the intermittent drainage; it does not address the seasonal wetland or other two features.

---

[32] DEIR, p. 6-7.
[33] BTR, p. 19.
[34] Hollingsworth B, M Stepek. 2011. Population status of Blainville's Horned Lizard (*Phrynosoma blainvillii*) at Marine Corps Base Camp Pendleton. Technical Report prepared for Naval Facilities Engineering Command, Southwest and Marine Corps Base Camp Pendleton. 37 pp. *See also* Brown TK. 2009. Blainville's Horned Lizard. Pages 162-165 *in*: Jones LC, RE Lovich (editors). Lizards of the American Southwest. Rio Nuevo Publishers, Tuscon, Arizona.
[35] Woodbridge B, CD Hargis. 2006. Northern goshawk inventory and monitoring technical guide. Gen. Tech. Rep. WO-71. Washington, DC: U.S. Department of Agriculture, Forest Service. 80 pp.
[36] *Ibid. See also* Hollingsworth B, M Stepek. 2011. Population status of Blainville's Horned Lizard (*Phrynosoma blainvillii*) at Marine Corps Base Camp Pendleton. Technical Report prepared for Naval Facilities Engineering Command, Southwest and Marine Corps Base Camp Pendleton. 37 pp.
[37] DEIR, p. 6-8.
[38] BTR, Table 4.
[39] BTR, p. 22.

Second, the DEIR misrepresents the conclusions made in the BTR. Specifically, the BTR did not conclude that the erosional channels and depression located at the southwestern end of the Project site are not jurisdictional features. It concluded: (a) the erosional features "*likely* do not meet the three criteria for wetlands," (b) "[i]t is *unlikely* any of these features would be considered waters of the United States and the State of California," and (c) the depression "*may be* considered jurisdictional by the ACOE or the RWQCB."[40] The City never obtained a jurisdictional determination from the U.S. Army Corps of Engineers ("Corps") to resolve these uncertainties. Instead, the DEIR treats the uncertainties presented in the BTR as facts, even though the BTR recommended: "a detailed jurisdictional delineation be verified by the appropriate regulatory agencies (e.g., ACOE and CDFW) *prior to any permanent plans for development of this property.*"[41] S-11

Third, the DEIR fails to discuss which features may: (a) qualify as waters of the state, or (b) be subject to Fish and Game Code 1602. This is important because features that do not qualify as wetlands or other waters of the United States may still fall under the State's jurisdiction (i.e., the State's jurisdiction is broader).[42] S-12

For these reasons, the DEIR fails to provide an accurate (or reliable) description of the environmental setting, and thus, of Project impacts to jurisdictional resources.

PROJECT IMPACTS and MITIGATION

Special-Status Plants

The DEIR acknowledges: "[r]emoval of special-status plant species for grading of the project site would result in a significant impact."[43] However, it concludes: "[i]mplementation of Mitigation Measure 6a would ensure that potential impacts to special-status plant species are reduced to a less-than-significant level."[44] As discussed below, the DEIR's conclusion is not supported by evidence due to the numerous flaws associated with Mitigation Measure 6a. S-13

Mitigation Measure 6a

Mitigation Measure 6a requires a survey for special-status plants prior to issuance of grading permits.[45] Although the DEIR states that the survey shall be conducted at a time when special-status plants are evident and identifiable, it also states: "[t]he specific timing of the surveys shall be determined by a qualified biologist." This is not a reliable strategy for three reasons:

First, the DEIR does not define what the City considers to be "qualified biologist," nor does it identify the party that would be responsible for approving the biologist's qualifications. As a

[40] BTR, pp. 9 and 10. [emphasis added].
[41] BTR, p. 23. [emphasis added].
[42] State Water Resources Control Board. 2019. State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. Staff Report Including the Substitute Environmental Documentation. 234 pp.
[43] DEIR, p. 6-17.
[44] *Ibid.*
[45] DEIR, p. 6-23.

result, the DEIR provides no assurances that the biologist would make appropriate decisions on the timing of the surveys, or that the biologist would have the qualifications necessary to identify all of the plants that occur at the Project site.

S-13 Cont.

Second, it is difficult for biologists to predict when special-status plants are evident and identifiable, especially because climate change is altering the phenology (seasonal timing) of many plant populations. As a result, the CDFW and U.S. Fish and Wildlife Service ("USFWS") survey protocols describe the need to visit reference sites to confirm special-status species with potential to occur at a project site are identifiable at the time of the botanical field survey.[46] The DEIR does not require visits to reference sites to confirm the pre-construction survey is appropriately timed.

S-14

Third, the DEIR fails to incorporate a mechanism that would ensure adequacy of the surveys, and similarly, reliability of the results. Specifically, the DEIR does not require the biologist to prepare a survey report, nor does it require the USFWS's and CDFW's approval of the survey results prior to issuance of the grading permits.

S-15

Mitigation Measure 6a states:

> If any special-status plant species are identified during the surveys, a no-disturbance buffer shall be created by the qualified biologist around the species. The perimeter of the buffer zone shall be fenced or marked with staked flags. If avoidance is not possible, consultation shall be initiated with CDFW or USFWS, depending on the status of the species, to establish a plan to ensure the continued presence of these species in the project region. This may include removing plants from the site and transplanting them to a location that is subject to a conservation easement or other mechanism to ensure it remains in open space, seed salvage, other plant propagation measures, and/or offsite habitat creation or restoration.

S-16

This is not a reliable mitigation strategy. The development plans provided by the Applicant suggest it will not be feasible to avoid impacts to special-status plants that occur at the Project site. However, even if it is feasible to install a no-disturbance buffer around the plants, the buffer will not prevent significant impacts. The effects of residential and commercial activities extend beyond direct impacts to habitat.[47] For example, the Project will cause habitat fragmentation and edge effects, which are known to have significant effects on the persistence on Stebbins' morning-glory and other gabbro plants.[48]

In addition, most plant populations shift spatially and temporally in response to climatic conditions and other factors that affect the soil seed bank. This is an important mechanism for

S-17

[46] California Department of Fish and Wildlife. 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. p. 6. *See also* U.S. Fish and Wildlife Service. 2000. Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants. p. 1.

[47] U.S. Fish and Wildlife Service. 2002. Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills. Portland, Oregon. pp. II-31 through II-36.

[48] *Ibid.*

persistence of the population.[49] Installing a buffer zone around the aboveground parts of the plant population, but allowing the Project to cover (e.g., with concrete) all belowground parts (including rhizomes and the soil seed bank), would not only have direct impacts on the plant population, but it would also permanently impact the environmental conditions that enable persistence of the population (e.g., environmental conditions that stimulate germination).[50] The DEIR does not analyze these impacts, nor does it incorporate any performance standards for persistence of special-status plants that are "avoided" during construction. Isolated "islands" of special-status plants disconnected from natural processes by the Project should not be considered protected because isolated populations are not sustainable. As a result, the no-disturbance buffer proposed in Mitigation Measure 6a does not ensure that significant impacts to special-status plants are avoided.

S-17 Cont.

The DEIR defers the mitigation "plan" that will be implemented for special-status plants that cannot be avoided during construction. However, it mentions transplantation, seed salvage, other plant propagation measures, and/or offsite habitat creation or restoration as potential options to "ensure the continued presence of the species in the Project region." CEQA specifically prohibits deferral of mitigation that a lead agency relies on for its conclusion of insignificance unless the lead agency: (1) commits itself to the mitigation, (2) adopts specific performance standards the mitigation will achieve, (3) identifies the type(s) of potential action(s) that can feasibly achieve that performance standard and that will be considered, analyzed, and potentially incorporated in the mitigation measure, and (4) demonstrates in the record that a detailed description of the mitigation measure(s) was impractical or infeasible during the Project's environmental review phase.[51] In this case, the DEIR suggests the performance standard is: "continued presence of these species in the project region." However, this standard is too vague to ensure Project impacts are mitigated to less-than-significant levels. For example, even if the Applicant's mitigation efforts are unsuccessful, the performance standard would be met as long as there is at least one other plant somewhere in the Project region (which is undefined). To comply with CEQA, the City must establish specific and measurable performance standards for Mitigation Measure 6a.

S-18

The DEIR's failure to provide specific performance standards for the mitigation is exacerbated by its failure to provide evidence that the proposed actions (e.g., transplantation of plants) are feasible mitigation techniques for the special-status plant species that may be impacted by the Project. Fiedler (1991) conducted a thorough review of mitigation-related transplantation, relocation and reintroduction attempts involving special-status plants in California.[52] She reported that only 8 of the 53 (15%) attempts reviewed in her study should be considered fully successful.[53] Although Fiedler reported several causes for the failed attempts, the common result was that the plants died.

S-19

[49] *See* Saatkamp A, P Poschlod, DL Venable. 2014. The functional role of soil seed banks in natural communities. In: Gallagher RS, ed. Seeds: the ecology of regeneration in plant communities. Wallingford, UK: CAB International, 263– 295.
[50] *Ibid.*
[51] Cal Code Regs. tit. 14 § 15126.4.
[52] Fiedler PL. 1991. Mitigation-related transplantation, relocation and reintroduction projects involving endangered and threatened, and rare plant species in California. Final Report. Available at: <nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=3173>.
[53] *Ibid.*

Whereas offsite habitat creation or restoration *may* be a feasible option, the DEIR provides no evidence that those techniques have worked for the special-status plant species that may be impacted by the Project. Furthermore, the DEIR fails to provide information critical to the offsite mitigation, including the: (a) the compensatory mitigation ratio, (b) timeline for implementation, (c) long-term management strategy,[54] and (d) monitoring and reporting requirements.

S-20

Finally, the DEIR fails to demonstrate that a detailed description of the mitigation measure was impractical or infeasible during the Project's environmental review phase. Indeed, it has been three years since Dudek concluded (in the BTR) that special-status plants may occur at the Project site. The DEIR fails to explain why protocol-level botanical surveys were not conducted in the intervening years, and why it was impractical or infeasible for the City to provide a detailed mitigation strategy in the DEIR.

S-21

Due to the issues described above, Mitigation Measure 6a does not ensure Project impacts to special-status plants would be mitigated to less-than-significant levels.

Special-Status Animals

The DEIR acknowledges: "[a]ny harm to Blainville's horned lizard or harm or nesting disruption that occurs to, northern goshawk or any nesting bird would be a significant impact."[55] The DEIR then concludes: "[w]ith implementation of Mitigation Measure 6b through 6d, potential impacts to Blainville's horned lizard and nesting birds would be reduced to a less-than-significant level." This conclusion is not justified because Mitigation Measure 6b through 6d are simply avoidance and minimization measures. None of the measures address habitat loss and degradation, which are the primary threats to both the Blainville's horned lizard and northern goshawk.[56]

Mitigation Measure 6b (Blainville's Horned Lizard)

S-22

Mitigation Measure 6b states:

> Prior to issuance of grading permits, a pre-construction survey shall be conducted to determine if Blainville's horned lizard is present on site. Surveys shall be conducted by a qualified biologist knowledgeable of the lizard species in the region and shall occur either mid-day in spring or early morning in summer, on a day with full sun or partly cloudy conditions and no precipitation. If any Blainville's horned lizard are identified during the surveys, a no-disturbance buffer shall be created by the qualified biologist around the species. The perimeter of the buffer zone shall be fenced or marked with staked flags. If avoidance is not possible, consultation shall be initiated with CDFW to determine if

[54] *See* U.S. Fish and Wildlife Service. 2002. Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills. Portland, Oregon. pp. II-34.
[55] DEIR, p. 6-17.
[56] Shuford WD, T Gardali. Editors. 2008. California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California. Western Field Ornithologists and California Department of Fish and Game. p. 159. *See also* Jennings MR, MP Hayes. 1994. Amphibian and reptile species of special concern in California. Rancho Cordova, CA: California Dept. of Fish and Game, Inland Fisheries Division. p. 132.

relocation is appropriate to conserve the species. If no evidence exists that Blainville's horned lizard are present on the project site, then no further mitigation is required.

There are several reasons why the proposed mitigation would not prevent direct impacts to the Blainville's horned lizard:

First, the DEIR fails to establish the methods that need to be implemented to locate horned lizards within construction areas. This is important because horned lizards are often buried in sand and impossible to locate visually. As a result, specialized techniques are generally required to identify presence of the species.[57] Because the DEIR fails to establish standards for the clearance surveys, it provides no assurances that direct mortality of lizards would be minimized. In practice, it is almost impossible to avoid direct impacts to all horned lizards during large-scale construction projects. Although attempts to salvage and relocate lizards may be appropriate mitigation, the DEIR needs to disclose the fact that salvage and relocation attempts will not prevent all horned lizards from being killed during construction of the Project.

S-22 Cont.

Second, the DEIR fails to establish the size of the no-disturbance buffer around horned lizards. As a result, it fails to ensure the buffer zone would be sufficient to avoid impacts to the species. Because horned lizards are active during the spring and summer (i.e., when the pre-construction survey is conducted), avoiding direct impacts to the species would require a buffer that encompasses each individual's home range (5,674m^2 for a lizard at Camp Pendleton).[58] This does not appear to be feasible, especially given the Applicant's intent to develop almost all of the Project site.[59]

S-23

Third, the DEIR fails to analyze the long-term fate of lizards that can be avoided by no-disturbance buffers. There is no potential for horned lizards to persist at the site if their "islands" of habitat are surrounded by roads, parking lots, and buildings.

S-24

Fourth, the DEIR fails to incorporate mitigation for lizards that cannot be avoided, other than consultation with CDFW to determine if relocation is appropriate. Dodd and Seigel (1991) reviewed projects involving relocation, repatriation, and translocation ("RRT") of amphibians and reptiles. The authors concluded "[m]ost RRT projects involving amphibians and reptiles have not demonstrated success as conservation techniques and should not be advocated as if they are acceptable management and mitigation practices."[60] Therefore, although relocation of horned lizards may be appropriate as a salvage measure, the City cannot assume it would reduce Project impacts to less-than-significant levels.

S-25

[57] Hollingsworth B, M Stepek. 2011. Population status of Blainville's Horned Lizard (*Phrynosoma blainvillii*) at Marine Corps Base Camp Pendleton. Technical Report prepared for Naval Facilities Engineering Command, Southwest and Marine Corps Base Camp Pendleton. 37 pp.
[58] *Ibid.*
[59] DEIR, Appendix B (*Project Plans*).
[60] Dodd CK Jr., RA Seigel. 1991. Relocation, repatriation, and translocation of amphibians and reptiles: Are they conservation strategies that work? Herpetologica 47(3):336-350.

Fifth, the DEIR fails to identify the mitigation that would be required if CDFW determines that relocation *is not* appropriate. CDFW may make this determination, because relocation can have significant impacts to both lizards that are relocated, and to lizards at the receptor site.[61]

S-26

For the reasons discussed above, Mitigation Measure 6b does not mitigate potentially significant impacts to the Blainville's horned lizard.

Mitigation Measure 6c (Nesting Birds)

Mitigation Measure 6c states:

> Should construction begin during the bird breeding season (February 1 through September 30), a pre-construction nesting bird survey shall be performed no sooner than 14 days prior to any groundbreaking activities or tree removal to determine if there are any active nests within the project area (including a 200-foot buffer for raptors). If the construction site remains inactive for more than 1 month during the breeding season and construction would resume during the breeding season, another preconstruction nesting bird survey shall be performed no sooner than 14 days prior to reactivation of construction activities on site. If any active nests are observed during surveys, an avoidance buffer shall be determined and flagged by the qualified biologist based on species, location, and planned construction activity. These nests shall be avoided until the chicks have fledged and the nests are no longer active, as determined by the qualified biologist. Avoidance could consist of delaying construction in proximity to the nest during the nesting season, or creating a buffer zone between the nest and the activity…[62]

S-27

Finding bird nests can be extremely difficult due to the tendency of many species to construct well-concealed or camouflaged nests.[63] As a result, finding bird nests is labor intensive and generally requires a variety of search techniques.[64] In addition, breeding birds are known to be most active and detectable early in the morning, and there is a strong positive correlation between survey effort and abundance of nests detected.

The City appears to assume that a single pre-construction survey would be sufficient to detect all bird nests on the 26.8-acre Project site. The City's assumption is not supported by evidence, especially because Mitigation Measure 6c fails to establish any standards for the: (a) nest searching techniques, (b) minimum level of effort (i.e., hours per unit area), and (c) time of day surveys will be permitted. This issue is compounded by the DEIR's failure to incorporate a mechanism that would ensure adequacy of the survey prior to ground disturbance activities.

S-28

The DEIR acknowledges potential (albeit "low") for northern goshawk nests at the Project site.[65]

S-29

[61] Germano JM, KJ Field, RA Griffiths, S Clulow, J Foster, G Harding, RR Swaisgood. 2015. Mitigation-driven translocations: Are we moving wildlife in the right direction? Frontiers in Ecology and the Environment 13.
[62] DEIR, p. 6-24.
[63] DeSante DF, GR Geupel. 1987. Landbird productivity in central coastal California: the relationship to annual rainfall and a reproductive failure in 1986. Condor. 89:636-653.
[64] *Ibid. See also* Martin TE, GR Geupel. 1993. Nest-Monitoring Plots: Methods for Locating Nests and Monitoring Success. J. Field Ornithol. 64(4):507-519.
[65] DEIR, p. 6-17.

Northern goshawk nest sites are often difficult to locate.[66] The U.S. Forest Service has developed a survey protocol for locating goshawk nests.[67] The DEIR does not require implementation of that protocol, and thus, does not require the Applicant to collect reliable information on the absence of goshawk nests prior to tree removal and other construction activities. S-29 Cont.

The DEIR states: "[i]f any active nests are observed during surveys, an avoidance buffer shall be determined and flagged by the qualified biologist based on species, location, and planned construction activity." The buffer size needed to avoid adverse effects to nesting birds is dependent on several situational and species-specific factors. Most biologists (including excellent "birders") have minimal knowledge of how these factors affect nesting success. Because the DEIR does not establish any minimum standards for the "qualified biologist," the City does not have the basis for assuming the biologist would be qualified to make appropriate decisions on the size of nest buffers. As a result, the DEIR must establish: (a) the minimum permissible size for nest buffers, or (b) a mechanism that ensures the buffer size selected by the biologist is sufficient to prevent impacts to the nest. S-30

Sensitive Natural Communities

Mitigation Measure 6e

Mitigation Measure 6e states:

> Prior to issuance of grading permits, the project applicant shall submit to the City evidence that compensatory habitat conservation and/or restoration for the loss of McNab cypress woodland and cottonwood forest is incorporated within the proposed landscaping plans and/or has been provided for through purchase of credits in a habitat mitigation bank and/or offsite habitat creation/restoration has been completed on a site subject to a conservation easement or other mechanism providing for the site's perpetual conservation.

Incorporating compensatory mitigation into the Project's landscaping plans would not replace the functions and values of the sensitive natural communities that are impacted at the Project site. Specifically, planting trees for landscaping does not replace a "woodland" or "forest." In addition, McNab cypress and Fremont cottonwood have specific habitat requirements that would most likely be eliminated by the Project.[68] Ultimately, the DEIR neither provides performance standards for the on-site mitigation, nor incorporates a mechanism to ensure long-term protection of McNab cypress woodland and cottonwood forest at the Project site. S-31

The DEIR suggests purchase of credits at a habitat mitigation bank is a feasible strategy for mitigating the Project's impacts on McNab cypress woodland and cottonwood forest. However, there do not appear to be any mitigation banks that are approved to sell credits for either of these S-32

[66] Woodbridge B, CD Hargis. 2006. Northern goshawk inventory and monitoring technical guide. Gen. Tech. Rep. WO-71. Washington, DC: U.S. Department of Agriculture, Forest Service. 80 pp.
[67] *Ibid.*
[68] For McNab Cypress *see* <http://vegetation.cnps.org/alliance/21>. For Fremont Cottonwood *see* <http://vegetation.cnps.org/alliance/68>.

vegetation communities.[69] The DEIR does not identify any such banks. This leaves offsite habitat creation/restoration as the only feasible option for mitigating Project impacts to McNab cypress woodland and cottonwood forest.

S-32 Cont.

According to the DEIR: "[t]he habitat conservation and/or restoration shall occur over a total area of 3.15 acres for McNab cypress woodland and 0.62 acres for cottonwood forest. This may include a combination of on-site replanting and restoration and off-site restoration sufficient to ensure no net loss of habitat functions or values."[70] The Project involves removal of all 3.15 acres of McNab cypress woodland and the majority of the 0.62 acres of cottonwood forest from the Project site.[71] Thus, the DEIR requires a 1:1 compensation ratio for impacts to these two communities. By definition, habitat creation or restoration means the habitat does not currently exist in the mitigation area. As a result, it will take many years for trees planted in the mitigation area to reach maturity, and thus, replace the habitat functions of the mature trees removed from the Project site.[72] There is consensus among the regulatory agencies that compensatory mitigation projects that result in temporal losses of habitat functions require a greater amount of compensatory mitigation.[73] For example, the USFWS reported:

> Compensatory mitigation projects must achieve conservation objectives within a reasonable timeframe and for at least the duration of the impacts. Ideally, compensatory mitigation should be implemented in advance of the action that adversely impacts the species or critical habitat. When this is not possible or practicable, temporal losses to the affected species must be compensated through some means (e.g., increased mitigation ratio that reflects the degree of temporal loss). Temporal loss may include indirect effects of the action on the species that occur beyond the time period of any direct effects of the action (e.g., removal of habitat during a season when individuals of a migratory species are absent). Temporal loss to the species as a result of both direct and indirect adverse effects must be addressed when determining appropriate compensatory mitigation. Losses of habitat that require many years to restore may best be offset by a combination of restored habitat, preservation of existing high-quality habitat, and improved management of existing habitat. The amount of temporal loss, the form of compensatory mitigation (i.e., establishment, enhancement, restoration, preservation, or some combination of these forms), and the time anticipated to establish the compensatory mitigation on the landscape should be used to determine the amount of compensatory mitigation needed to

S-33

[69] *See* California Department of Fish and Wildlife. 2019. Conservation and Mitigation Banks Established in California by CDFW [website]. Available at: <https://www.wildlife.ca.gov/Conservation/Planning/Banking/Approved-Banks#r2>. *See also* U.S. Army Corps of Engineers. 2019. RIBITS (Regulatory In lieu fee and Bank Information Tracking System) [website]. Available at: <https://ribits.usace.army.mil/ribits_apex/f?p=107:2:7952800670839::NO:::>.

[70] DEIR, p. 6-25.

[71] DEIR, p. 6-19.

[72] BTR, p. 16. The BTR does not describe the age of McNab cypress at the Project site; however, based on Google Earth imagery, the trees are at least 15 years old.

[73] Department of the Interior, U.S. Fish and Wildlife Service. 2016. Endangered and Threatened Wildlife and Plants; Endangered Species Act Compensatory Mitigation Policy. 81 FR 61031. *See also* Clement, J.P. et al. 2014. A strategy for improving the mitigation policies and practices of the Department of the Interior. A report to the Secretary of the Interior from the Energy and Climate Change Task Force, Washington, D.C., 25 pp. *See also* State Water Resources Control Board. 2019. State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. Staff Report Including the Substitute Environmental Documentation. 234 pp. *See also* US Army Corps of Engineers. 2015. Final 2015 Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division USACE. pp. 16 through 18.

> meet the mitigation goal for the species, critical habitat, and/or other resources of concern.[74]

The 1:1 habitat compensation ratio proposed in the DEIR does not account for temporal loss of habitat functions, and thus, it would not mitigate Project impacts to less-than-significant levels. This issue is exacerbated by the DEIR's failure to establish performance standards for the mitigation, and to incorporate any monitoring and reporting requirements. As a result, Project impacts to sensitive natural communities remain significant.

S-33 Cont

Jurisdictional Waters

The DEIR's analysis of impacts to jurisdictional waters is limited to federally protected wetlands. There is no analysis of impacts to waters of the state or riparian habitats protected under Fish and Game Code. This issue is exacerbated by the lack of a jurisdictional determination from the Corps.

The DEIR concludes: "[i]mplementation of Mitigation Measure 6f would ensure that there is no net loss of habitat values and functions in the region, and would reduce this impact to less than significant."[75] As discussed below, the DEIR's conclusion is not supported by evidence.

Mitigation Measure 6f (Jurisdictional Waters)

Mitigation Measure 6f requires the Applicant to acquire a Clean Water Act Section 404 permit and Section 401 Water Quality Certification. In addition, it requires the Applicant to compensate for the loss jurisdictional wetlands that are impacted by the Project. The DEIR concludes these actions would reduce Project impacts to wetlands to a less-than-significant level. There are two main reasons why the DEIR's conclusion is not supported by evidence:

S-34

First, the DEIR impermissibly defers analysis and critical aspects of the wetlands mitigation strategy. Under CEQA, the City is obligated to identify the specific mitigation needed to mitigate Project impacts to less-than-significant levels. This includes the specific mitigation approach, compensation ratio, monitoring program, and performance standards that will be implemented to ensure the Project would have less-than-significant impacts under CEQA (i.e., independent of analysis conducted by the Corps and RWQCB to ensure compliance with state and federal wetland regulations).

Contrary to what the DEIR suggests, the City cannot rely on deferred mitigation and the permitting requirements of other agencies to conclude impacts to wetlands would be mitigated to less-than-significant levels. For example, in its comment letter to the lead agency for another project, the RWQCB stated:

> It is inappropriate to rely upon agency regulations for determining that impacts will be at insignificant levels…Water Board staff strongly discourages the County [of Kern] from attempting to defer to the later preparation of Waste Discharge Requirements (WDRs) permits to address the above issues. Such an approach would constitute deferment of

[74] *Ibid.*
[75] DEIR, p. 6-20.

> mitigation. In the event that this occurs, the Water Board may require substantial modifications to the Project during the course of permitting review to ensure all water quality impacts [are] adequately mitigated. Water Board staff encourages the Project proponents to initiate detailed plans early in the process to allow for full and adequate review of the Project to address the above issues. This planning should be concurrent with the CEQA process as opposed to a sequential permitting approach.[76]

S-34 Cont.

Second, compliance with regulatory permits provides no assurances that Project impacts to jurisdictional wetlands would be less-than-significant. To the contrary, numerous studies have demonstrated that many compensatory mitigation projects permitted under Sections 401 and 404 of the Clean Water Act are not achieving the goal of "no overall net loss" of wetland acres and functions.[77] For example, Ambrose and Lee (2004) concluded: "the Section 401 program has failed to achieve the goal of no net loss of habitat functions, values and services."[78] Similarly, the National Academy of Sciences (2001) conducted a comprehensive review of compensatory wetland mitigation projects in the U.S. and found that the national "no net loss" goal is not being met because: (a) there is little monitoring of permit compliance, and (b) the permit conditions commonly used to establish mitigation success do not assure the establishment of wetland functions.[79] Ambrose et al. (2007) derived similar results after examining 143 projects permitted by the California State Water Resources Control Board. Specifically, they concluded: (a) only 46% of the projects fully complied with all permit conditions, and (b) very few wetland mitigation projects were successful, especially from the ecological perspective.[80] Several other studies have shown that the regulatory agencies are not ensuring the success of wetland mitigation projects.[81] Most notably, a 2005 report issued by the United States Government Accountability Office concluded that: "the Corps of Engineers does not have an effective oversight approach to ensure that compensatory mitigation is occurring."[82] For these reasons, Mitigation Measure 6f does not ensure that the Project's impacts to wetlands would be mitigated to less-than-significant levels.

S-35

[76] Kern County. 2011 Oct. Final Environmental Impact Report: RE Distributed Solar Projects, Chapter 7-4 (part 1), comment letter 8.

[77] National Research Council. 2001. Compensating for wetland losses under the Clean Water Act. National Research Committee on Mitigating Wetland Losses. National Academy Press, Washington DC, USA. *See also* Environmental Law Institute. 2004. Measuring Mitigation: A Review of the Science for Compensatory Mitigation Performance Standards. Report prepared for the US Environmental Protection Agency. 271 pp. *See also* Kihslinger RL. 2008. Success of Wetland Mitigation Projects. 2008. National Wetlands Newsletter 30(2):14-16.

[78] Ambrose RF, SF Lee. 2004. Guidance Document for Compensatory Mitigation Projects Permitted Under Clean Water Act Section 401 by the Los Angeles Regional Quality Control Board. p. 8.

[79] National Research Council. 2001. Compensating for wetland losses under the Clean Water Act. National Research Committee on Mitigating Wetland Losses. National Academy Press, Washington DC, USA.

[80] Ambrose RF, JL Callaway, SF Lee. 2007. An Evaluation of Compensatory Mitigation Projects Permitted Under Clean Water Act Section 401 by the California State Water Resources Control Board, 1991-2002. xxiv + 396 pp.

[81] Kihslinger RL. 2008. Success of Wetland Mitigation Projects. 2008. National Wetlands Newsletter 30(2):14-16. *See also* Environmental Law Institute. 2004. Measuring Mitigation: A Review of the Science for Compensatory Mitigation Performance Standards. Report prepared for the US Environmental Protection Agency. 271 pp.

[82] United States Government Accountability Office. 2005. Corps of Engineers Does Not Have an Effective Oversight Approach to Ensure That Compensatory Mitigation Is Occurring. Report to the Ranking Democratic Member, Committee on Transportation and Infrastructure, House of Representatives. GAO-05-898 Wetlands Protection. Available at: <http://www.gao.gov/assets/250/247675.pdf>.

Cumulative Impacts

CEQA Guidelines § 15130(b)(3) direct lead agencies to define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limitation used. Although the DEIR defines the geographic scope as the City of Grass Valley, it fails to provide an explanation for that geographic limitation.

The DEIR argues that compliance with the General Plan and City ordinances eliminates the potential for cumulative impacts to biological resources in Grass Valley, and thus: "there would be no significant cumulative impact to which the project could contribute."[83] There is substantial scientific evidence that contradicts this argument. For example, the *Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills* notes that at the scale of individual populations, habitat fragmentation and edge effects associated with development projects can cumulatively result in local extirpation or extinction of an entire taxon (listed species).[84] There are only 11 remaining populations of Stebbins' morning-glory.[85] Cumulative impacts to the species have been, and continue to be, significant.[86] If Stebbins' morning-glory occurs at the Project site, the Project's contribution to significant cumulative impacts would be considerable, especially because there is only one population known to occur in the vicinity of Grass Valley (i.e., the geographic scope of the City's cumulative impacts analysis).[87] S-36

Moreover, the Project *does not* comply with the policies and standards identified in the General Plan. For example:

1. The General Plan requires an inventory of sensitive environmental areas and features (1-COSO). The DEIR fails to satisfy this requirement. Indeed, it acknowledges the site surveys were not sufficient to determine presence of special-status plants and animals at the Project site. S-37
2. The General Plan requires the protection of rare and endangered animals and plants (3-COSO). As the DEIR acknowledges, it may be infeasible for the Applicant to avoid direct impacts to special-status species, including Stebbins' morning-glory—*which is an endangered species.* S-38
3. The General Plan requires encouragement of wildlife through habitat protection (5-COSO). Although the DEIR acknowledges the Project may impact habitat for the Blainville's horned lizard, northern goshawk, and other wildlife species, it does not require the Applicant to protect any wildlife habitat. S-39
4. The General Plan requires assurance of appropriate resource conservation and environmental protection measures as prerequisites to development (6-COSO). The DEIR does not provide assurance of appropriate resource conservation and environmental protection measures because it: (a) defers formulation of the specific measures that will S-40

[83] DEIR, p. 6-22.
[84] U.S. Fish and Wildlife Service. 2002. Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills. Portland, Oregon. p. II-33.
[85] California Natural Diversity Database. 2019 Jun 4. RareFind 5. California Department of Fish and Wildlife.
[86] U.S. Fish and Wildlife Service. 2002. Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills. Portland, Oregon. pp. II-31 through -37.
[87] California Natural Diversity Database. 2019 Jun 4. RareFind 5. California Department of Fish and Wildlife.

be implemented to mitigate Project impacts, (b) does not incorporate performance standards for the mitigation, and (c) does not incorporate a monitoring and reporting program that ensures that whatever measures the Applicant elects to implement successfully conserved and protected sensitive biological resources. Furthermore, the DEIR allows the Applicant to implement *inappropriate* measures as compensatory mitigation, including: (a) planting individual "landscaping" trees throughout the Project site to mitigate impacts to sensitive forest and woodland communities, and (b) preserving islands of habitat within the Project's urban environment as mitigation for Project impacts to special-status plants. These measures will not protect the resources of concern, and they have no conservation value.

S-41

The DEIR's analysis of cumulative impacts to biological resources concludes with the statement that: "implementation of Mitigation Measures 6a through 6f would ensure that the project would result in no net loss of habitat functions or values."[88] This conclusion is inconsistent with the information provided in the DEIR. For example, the DEIR does not require any compensatory mitigation for Project impacts to habitat for the Blainville's horned lizard and northern goshawk, and it allows mitigation for other sensitive resources (e.g., special-status plants) to occur onsite where habitat functions and values will be degraded (or eliminated entirely). Consequently, it is overly clear that implementation of Mitigation Measures 6a through 6f would indeed result in net loss of habitat functions and values.

S-42

This concludes my comments on the DEIR.

Sincerely,

Scott Cashen, M.S.
Senior Biologist

[88] DEIR, pp. 6-22 and -23.

Scott Cashen, M.S.
Senior Wildlife Ecologist

Scott Cashen has 25 years of professional experience in natural resources management. During that time he has worked as a field biologist, forester, environmental consultant, and instructor of Wildlife Management. Mr. Cashen focuses on CEQA/NEPA compliance issues, endangered species, scientific field studies, and other topics that require a high level of scientific expertise.

Mr. Cashen has knowledge and experience with numerous taxa, ecoregions, biological resource issues, and environmental regulations. As a biological resources expert, Mr. Cashen is knowledgeable of the various agency-promulgated guidelines for field surveys, impact assessments, and mitigation. Mr. Cashen has led field investigations on several special-status species, including ones focusing on the yellow-legged frog, red-legged frog, desert tortoise, steelhead, burrowing owl, California spotted owl, northern goshawk, willow flycatcher, Peninsular bighorn sheep, red panda, and various forest carnivores.

Mr. Cashen is a recognized expert on the environmental impacts of renewable energy development. He has been involved in the environmental review process of over 80 solar, wind, biomass, and geothermal energy projects. Mr. Cashen's role in this capacity has encompassed all stages of the environmental review process, from initial document review through litigation support. Mr. Cashen has provided expert witness testimony on several of the Department of the Interior's "fast-tracked" renewable energy projects. His testimony on those projects helped lead agencies develop project alternatives and mitigation measures to reduce environmental impacts associated with the projects.

Mr. Cashen was a member of the independent scientific review panel for the Quincy Library Group project, the largest community forestry project in the United States. As a member of the panel, Mr. Cashen was responsible for advising the U.S. Forest Service on its scientific monitoring program, and for preparing a final report to Congress describing the effectiveness of the Herger-Feinstein Forest Recovery Act of 1998.

AREAS OF EXPERTISE

- CEQA, NEPA, and Endangered Species Act compliance issues
- Comprehensive biological resource assessments
- Endangered species management
- Renewable energy development
- Scientific field studies, grant writing and technical editing

EDUCATION

M.S. Wildlife and Fisheries Science - The Pennsylvania State University (1998)
Thesis: *Avain Use of Restored Wetlands in Pennsylvania*
B.S. Resource Management - The University of California, Berkeley (1992)

PROFESSIONAL EXPERIENCE

Litigation Support / Expert Witness

Mr. Cashen has served as a biological resources expert for over 100 projects subject to environmental review under the California Environmental Quality Act (CEQA) and/or the National Environmental Policy Act (NEPA). As a biological resources expert, Mr. Cashen reviews CEQA/NEPA documents and provides his clients with an assessment of biological resource issues. He then submits formal comments on the scientific and legal adequacy of the project's environmental documents (e.g., Environmental Impact Statement). If needed, Mr. Cashen conducts field studies to generate evidence for legal testimony, or he can obtain supplemental testimony from his deep network of species-specific experts. Mr. Cashen has provided written and oral testimony to the California Energy Commission, California Public Utilities Commission, and U.S. district courts. His clients have included law firms, non-profit organizations, and citizen groups.

REPRESENTATIVE EXPERIENCE

Solar Energy

- Abengoa Mojave Solar Project
- Avenal Energy Power Plant
- Beacon Solar Energy Project
- Blythe Solar Power Project
- Calico Solar Project
- California Flats Solar Project
- Calipatria Solar Farm II
- Carrizo Energy Solar Farm
- Catalina Renewable Energy Project
- Fink Road Solar Farm
- Genesis Solar Energy Project
- Heber Solar Energy Facility
- Imperial Valley Solar Project
- Ivanpah Solar Electric Generating
- Maricopa Sun Solar Complex
- McCoy Solar Project
- Mt. Signal and Calexico Solar
- Panoche Valley Solar
- San Joaquin Solar I & II
- San Luis Solar Project
- Stateline Solar Project
- Solar Gen II Projects
- SR Solis Oro Loma
- Vestal Solar Facilities
- Victorville 2 Power Project
- Willow Springs Solar

Geothermal Energy

- Casa Diablo IV Geothermal Project
- East Brawley Geothermal
- Mammoth Pacific 1 Replacement
- Orni 21 Geothermal Project
- Western GeoPower Plant

Wind Energy

- Catalina Renewable Energy Project
- Ocotillo Wind Energy Project
- SD County Wind Energy Ordinance
- Searchlight Wind Project
- Shu'luuk Wind Project
- Tres Vaqueros Repowering Project
- Tule Wind Project
- Vasco Winds Relicensing Project

Biomass Facilities

- CA Ethanol Project
- Colusa Biomass Project
- Tracy Green Energy Project

Other

- DRECP
- Carnegie SVRA Expansion Project
- Lakeview Substation Project
- Monterey Bay Shores Ecoresort
- Phillips 66 Rail Spur
- Valero Benecia Crude By Rail
- World Logistics Center

Project Management

Mr. Cashen has managed several large-scale wildlife, forestry, and natural resource management projects. Many of the projects have required hiring and training field crews, coordinating with other professionals, and communicating with project stakeholders. Mr. Cashen's experience in study design, data collection, and scientific writing make him an effective project manager, and his background in several different natural resource disciplines enable him to address the many facets of contemporary land management in a cost-effective manner.

REPRESENTATIVE EXPERIENCE

Wildlife Studies

- Peninsular Bighorn Sheep Resource Use and Behavior Study: (*CA State Parks*)
- "KV" Spotted Owl and Northern Goshawk Inventory: (*USFS, Plumas NF*)
- Amphibian Inventory Project: (*USFS, Plumas NF*)
- San Mateo Creek Steelhead Restoration Project: (*Trout Unlimited and CA Coastal Conservancy, Orange County*)
- Delta Meadows State Park Special-Status Species Inventory: (*CA State Parks, Locke*)

Natural Resources Management

- Mather Lake Resource Management Study and Plan – (*Sacramento County*)
- Placer County Vernal Pool Study – (*Placer County*)
- Weidemann Ranch Mitigation Project – (*Toll Brothers, Inc., San Ramon*)
- Ion Communities Biological Resource Assessments – (*Ion Communities, Riverside and San Bernardino Counties*)
- Del Rio Hills Biological Resource Assessment – (*The Wyro Company, Rio Vista*)

Forestry

- Forest Health Improvement Projects – (*CalFire, SD and Riverside Counties*)
- San Diego Bark Beetle Tree Removal Project – (*SDG&E, San Diego Co.*)
- San Diego Bark Beetle Tree Removal Project – (*San Diego County/NRCS*)
- Hillslope Monitoring Project – (*CalFire, throughout California*)

Biological Resources

Mr. Cashen has a diverse background with biological resources. He has conducted comprehensive biological resource assessments, habitat evaluations, species inventories, and scientific peer review. Mr. Cashen has led investigations on several special-status species, including ones focusing on the foothill yellow-legged frog, mountain yellow-legged frog, desert tortoise, steelhead, burrowing owl, California spotted owl, northern goshawk, willow flycatcher, Peninsular bighorn sheep, red panda, and forest carnivores.

REPRESENTATIVE EXPERIENCE

Biological Assessments/Biological Evaluations ("BA/BE")

- Aquatic Species BA/BE – Reliable Power Project (*SF Public Utilities Commission*)
- Terrestrial Species BA/BE – Reliable Power Project (*SF Public Utilities Commission*)
- Management Indicator Species Report – Reliable Power Project (*SF Public Utilities Commission*)
- Migratory Bird Report – Reliable Power Project (*SF Public Utilities Commission*)
- Terrestrial and Aquatic Species BA – Lower Cherry Aqueduct (*SF Public Utilities Commission*)
- Terrestrial and Aquatic Species BE – Lower Cherry Aqueduct (*SF Public Utilities Commission*)
- Terrestrial and Aquatic Species BA/BE – Public Lands Lease Application (*Society for the Conservation of Bighorn Sheep*)
- Terrestrial and Aquatic Species BA/BE – Simon Newman Ranch (*The Nature Conservancy*)

Avian

- Study design and Lead Investigator - Delta Meadows State Park Special-Status Species Inventory *(CA State Parks: Locke)*
- Study design and lead bird surveyor - Placer County Vernal Pool Study *(Placer County: throughout Placer County)*
- Surveyor - Willow flycatcher habitat mapping *(USFS: Plumas NF)*
- Independent surveyor - Tolay Creek, Cullinan Ranch, and Guadacanal Village restoration projects *(Ducks Unlimited/USGS: San Pablo Bay)*
- Study design and Lead Investigator - Bird use of restored wetlands research *(Pennsylvania Game Commission: throughout Pennsylvania)*
- Study design and surveyor - Baseline inventory of bird species at a 400-acre site in Napa County *(HCV Associates: Napa)*

- Surveyor - Baseline inventory of bird abundance following diesel spill *(LFR Levine-Fricke: Suisun Bay)*
- Study design and lead bird surveyor - Green Valley Creek Riparian Restoration Site *(City of Fairfield: Fairfield, CA)*
- Surveyor - Burrowing owl relocation and monitoring *(US Navy: Dixon, CA)*
- Surveyor - Pre-construction burrowing owl surveys *(various clients: Livermore, San Ramon, Rio Vista, Napa, Victorville, Imperial County, San Diego County)*
- Surveyor - Backcountry bird inventory *(National Park Service: Eagle, Alaska)*
- Lead surveyor - Tidal salt marsh bird surveys (*Point Reyes Bird Observatory: throughout Bay Area*)
- Surveyor – Pre-construction surveys for nesting birds (*various clients and locations)*

Amphibian

- Crew Leader - Red-legged frog, foothill yellow-legged frog, and mountain yellow-legged frog surveys *(USFS: Plumas NF)*
- Surveyor - Foothill yellow-legged frog surveys *(PG&E: North Fork Feather River)*
- Surveyor - Mountain yellow-legged frog surveys *(El Dorado Irrigation District: Desolation Wilderness)*
- Crew Leader - Bullfrog eradication *(Trout Unlimited: Cleveland NF)*

Fish and Aquatic Resources

- Surveyor - Hardhead minnow and other fish surveys *(USFS: Plumas NF)*
- Surveyor - Weber Creek aquatic habitat mapping (*El Dorado Irrigation District: Placerville, CA*)
- Surveyor - Green Valley Creek aquatic habitat mapping *(City of Fairfield: Fairfield, CA)*
- GPS Specialist - Salmonid spawning habitat mapping *(CDFG: Sacramento River)*
- Surveyor - Fish composition and abundance study (*PG&E: Upper North Fork Feather River and Lake Almanor*)
- Crew Leader - Surveys of steelhead abundance and habitat use *(CA Coastal Conservancy: Gualala River estuary)*
- Crew Leader - Exotic species identification and eradication *(Trout Unlimited: Cleveland NF)*

Mammals

- Principal Investigator – Peninsular bighorn sheep resource use and behavior study (*California State Parks: Freeman Properties*)
- Scientific Advisor –Study on red panda occupancy and abundance in eastern Nepal *(The Red Panda Network: CA and Nepal)*
- Surveyor - Forest carnivore surveys *(University of CA: Tahoe NF)*
- Surveyor - Relocation and monitoring of salt marsh harvest mice and other small mammals *(US Navy: Skagg's Island, CA)*
- Surveyor – Surveys for Monterey dusky-footed woodrat. Relocation of woodrat houses (*Touré Associates: Prunedale*)

Natural Resource Investigations / Multiple Species Studies

- Scientific Review Team Member – Member of the scientific review team assessing the effectiveness of the US Forest Service's implementation of the Herger-Feinstein Quincy Library Group Act.
- Lead Consultant - Baseline biological resource assessments and habitat mapping for CDF management units *(CDF: San Diego, San Bernardino, and Riverside Counties)*
- Biological Resources Expert – Peer review of CEQA/NEPA documents (*various law firms, non-profit organizations, and citizen groups)*
- Lead Consultant - Pre- and post-harvest biological resource assessments of tree removal sites *(SDG&E: San Diego County)*
- Crew Leader - T&E species habitat evaluations for Biological Assessment in support of a steelhead restoration plan *(Trout Unlimited: Cleveland NF)*
- Lead Investigator - Resource Management Study and Plan for Mather Lake Regional Park *(County of Sacramento: Sacramento, CA)*
- Lead Investigator - Biological Resources Assessment for 1,070-acre Alfaro Ranch property *(Yuba County, CA)*
- Lead Investigator - Wildlife Strike Hazard Management Plan *(HCV Associates: Napa)*
- Lead Investigator - Del Rio Hills Biological Resource Assessment *(The Wyro Company: Rio Vista, CA)*
- Lead Investigator – Ion Communities project sites (*Ion Communities: Riverside and San Bernardino Counties*)
- Surveyor – Tahoe Pilot Project: Validation of California's Wildlife Habitat Relationships (CWHR) Model *(University of California: Tahoe NF)*

Forestry

Mr. Cashen has five years of experience working as a consulting forester on projects throughout California. Mr. Cashen has consulted with landowners and timber operators on forest management practices; and he has worked on a variety of forestry tasks including selective tree marking, forest inventory, harvest layout, erosion control, and supervision of logging operations. Mr. Cashen's experience with many different natural resources enable him to provide a holistic approach to forest management, rather than just management of timber resources.

REPRESENTATIVE EXPERIENCE

- Lead Consultant - CalFire fuels treatment projects *(SD and Riverside Counties)*
- Lead Consultant and supervisor of harvest activities – San Diego Gas and Electric Bark Beetle Tree Removal Project *(San Diego)*
- Crew Leader - Hillslope Monitoring Program *(CalFire: throughout California)*
- Consulting Forester – Forest inventories and timber harvest projects *(various clients throughout California)*

Grant Writing and Technical Editing

Mr. Cashen has prepared and submitted over 50 proposals and grant applications. Many of the projects listed herein were acquired through proposals he wrote. Mr. Cashen's clients and colleagues have recognized his strong scientific writing skills and ability to generate technically superior proposal packages. Consequently, he routinely prepares funding applications and conducts technical editing for various clients.

PERMITS

U.S. Fish and Wildlife Service Section 10(a)(1)(A) Recovery Permit for the Peninsular bighorn sheep

PROFESSIONAL ORGANIZATIONS / ASSOCIATIONS

The Wildlife Society
Cal Alumni Foresters
Mt. Diablo Audubon Society

OTHER AFFILIATIONS

Scientific Advisor and Grant Writer – *The Red Panda Network*
Scientific Advisor – *Mt. Diablo Audubon Society*
Grant Writer – *American Conservation Experience*

TEACHING EXPERIENCE

Instructor: Wildlife Management - The Pennsylvania State University, 1998

Teaching Assistant: Ornithology - The Pennsylvania State University, 1996-1997

PUBLICATIONS

Gutiérrez RJ, AS Cheng, DR Becker, S Cashen, et al. 2015. Legislated collaboration in a conservation conflict: a case study of the Quincy Library group in California, USA. Chapter 19 *in*: Redpath SR, et al. (eds). Conflicts in Conservation: Navigating Towards Solutions. Cambridge Univ. Press, Cambridge, UK.

Cheng AS, RJ Gutiérrez RJ, S Cashen, et al. 2016. Is There a Place for Legislating Place-Based Collaborative Forestry Proposals?: Examining the Herger-Feinstein Quincy Library Group Forest Recovery Act Pilot Project. Journal of Forestry.

INTENTIONALLY LEFT BLANK

Response to Comment Letter S

Scott Cashen
June 24, 2019

S-1 This comment provides introductory comments, summarizes the proposed project, and describes the commenter's qualifications as an independent biological resources consultant.

The comment does not identify any inaccuracies or inadequacies in the Draft EIR or address the project's environmental effects. No response is required. Specific concerns raised in the subsequent comments within this comment letter are identified and responded to below.

S-2 The comment quotes text from the Draft EIR regarding special-status plant and animal species and compares that text with text from the Biological Technical Report that references quadrangles that are not located in the project region. The comment notes that all of the appendices to the Biological Technical Report apply to an unrelated project in the San Francisco Bay Area and requests that the correct appendices be provided and the Draft EIR recirculated.

As discussed in Response to Comment G-2, the incorrect appendices were attached to the Biological Technical Report due to an error made during production. However, Chapter 6 of the Draft EIR correctly identifies the USGS quadrangles that were included in the special-status species database review. Photographs of the project site are included in other portions of the Draft EIR, including Chapter 2, Project Description, and Chapter 5, Aesthetics. Thus the inadvertent use of photos from another project site does not impair the public's ability to review and comment on the Draft EIR. The list of plant species observed within the project site (Biological Technical Report Appendix B) and the potential for special status species to occur onsite (Biological Technical Report Appendix C) provide additional characterization of the project site but do not provide information that is essential to understanding the environmental setting or the project's potential impacts because Draft EIR Chapter 6 correctly identifies the special-status species that are considered to have moderate potential to occur onsite. CEQA Guidelines Section 15088.5 defines "significant new information" as a new significant environmental impact, a substantial increase in the severity of an impact, a new feasible project alternative that is considerably different from others previously analyzed and/or information needed because the Draft EIR was fundamentally inadequate and conclusory in nature. The impacts analyzed in Chapter 6: Biological Resources have remained unchanged and are supported by the paraphrased findings of the appendices of the Biological Technical Report. The Final EIR does not introduce a new environmental impact, a substantial increase of an environmental impact, or a new feasible alternative, and the DEIR provided detailed explanations for its environmental impact conclusions. The corrected appendices have been provided with this Final EIR; replacement of the appendices does not constitute substantial new information as defined in CEQA Guidelines Section 15088.5 because the public has not been deprived of a meaningful opportunity to comment on the project's environmental effects, thus it is not necessary to recirculate the Draft EIR.

S-3 The comment states that the abandoned mine features, mature trees, and rock outcrops within the project site may provide potential habitat for several special-status bat species, that loss of roosting sites can have severe implications for the overall population, and that the Draft EIR should discuss and provide mitigation for the project's potential impacts to bats.

It is noted that the commenter did not conduct a site investigation and therefore has not examined the mine features for suitability as roosting sites. The abandoned onsite mine features consist of relict concrete structures and an apparent shaft. During her site visit, Dudek's biologist noted that the features appeared sealed and no openings suitable for bat entrance and egress were observed. Thus while bat species are known to roost in mine features generally, the features present at the project site do not support bat roosting. Trees onsite consist primarily of ponderosa pine, which could potentially provide roosting habitat for several species of bat. However, the site has limited to no foraging habitat for most bat species because it is isolated and surrounded by development. Additionally, most of the bat species that have potential to occur in the region have not been previously documented in the vicinity of the project site. Given the past disturbance to the habitat within the site, the isolated and fragmented nature of the habitat onsite, and the unsuitability of the mine features onsite, it is unlikely that special-status bat species occur on the project site and no impacts to bat roosting are expected to occur. Additional descriptions of the bat species mentioned in this comment are provided below.

Townsend's big-eared bat is a California species of special concern. This species may utilize abandoned mine features, rock crevices, and hollow trees as roost sites. This species most often roosts pendant-like on open surfaces, thus making the vertical mine shaft less than ideal roosting habitat. Additionally, the opening to the mine shaft appeared to be well sealed during the biological site surveys, making entry or exit for bats extremely unlikely. Rock outcroppings onsite are generally limited to smaller jumbles of rocks without suitable bat roosting crevices. Tree roosting habitat was also limited as there were no snags with suitable hollows and exfoliating bark was limited. This species has been previously documented at Empire Mine State Park, approximately 1.3 miles south of the project site (CDFW 2019).

Pallid bat is a California species of special concern and a USFWS sensitive species. This species may utilize exfoliating bark of trees, caves, mines, and rock outcrops for roost sites. As described above for Townsend's big-eared bat, there is extremely limited habitat for this species onsite. Pallid bat generally requires unobstructed entrances and exits for roost sites. The nearest documented occurrence of this species is approximately 27 miles south of the project site (CDFW 2019).

Hoary bat is not state or federally listed and does not technically fit in the category of special-status. This species generally roosts in the canopy of both coniferous and deciduous trees, approximately 3 to 12 meters above the ground. Roosts are usually located near the edge of a clearing. The nearest documented occurrence of this species is located approximately 15 miles west of the project site (CDFW 2019).

Silver-haired bat is not state or federally listed. This species roosts in trees inside natural hollows and bird excavated cavities, as well as under loose bark of large diameter snags. Hibernacula includes hollow trees, sloughing bark, rock crevices, and occasionally under wood piles, leaf litter, under foundations, in buildings, mines and caves. The nearest documented occurrence of this species is located approximately 23 miles north of the project site (CDFW 2019).

Yuma myotis is not state or federally listed. This species is typically associated with permanent water sources such as rivers and streams. Roosts include bridges, buildings, cliff crevices, caves, mines, and trees. The nearest documented occurrence of this species is approximately 15 miles west of the project site (CDFW 2019).

Long-eared myotis is not state or federally listed. This species typically roosts under exfoliating tree bark, in hollow trees, caves, mines, cliff crevices, sinkholes, and rocky outcrops on the ground. The rock outcrops onsite may provide potentially suitable roosting habitat for this species. The nearest documented occurrence of this species is located approximately 26 miles northeast of the project site (CDFW 2019).

Long-legged myotis is a California species of special concern. This species typically inhabits coniferous forest, but may also utilize riparian and desert habitats. It roosts in abandoned buildings, cracks in the ground, cliff crevices, exfoliating tree bark, and hollows within snags. Caves and mines are common hibernacula. The nearest documented is over 20 miles east of the project site, at higher elevations than those found at the project site (CDFW 2019).

Fringed myotis is a California species of special concern. This species typically roosts in large, decadent trees and snags, but has also been documented roosting in underground mines, rocks, cliff faces, and bridges. The nearest documented occurrence is over 20 miles north of the project site (CDFW 2019).

S-4 The comment states that the Draft EIR conclusions regarding the potential for special-status plant species to occur onsite cannot be validated because the Biological Technical Report references a project location in the Bay Area and neither the EIR or the technical report provide rationale for determining which species have potential to occur at this project site. The comment notes discrepancies between the technical report and the EIR, such as the potential for Follett's monardella and dubious pea to occur onsite.

As discussed in Response to Comments S-2 and G-2, the correct Biological Technical Report appendices have been provided with this Final EIR. Text edits have been made in the Biological Technical Report and Draft EIR Chapter 6 to clarify the potential for special status plant species to occur onsite. The Biological Technical Report references to dubious pea have been removed; the Draft EIR is correct to identify Follett's monardella as a special-status plant with potential to occur at the project site.

S-5 The comment states that the Draft EIR ignores plants that have a California Rare Plant Rank of 3 or 4 and incorrectly states that these plants do not meet the criteria or definitions of special status plants that are cited in the Draft EIR.

All of the plant species with a California Rare Plant Rank of 1A, 1B, and 2 meet the requirements of the California Native Plant Protection Act (Section 1901, Chapter 10) or Section 2062 and 2067 of California Endangered Species Act, and are eligible for state listing. Species maintained by CNPS with these three rankings are considered special-status species under the CEQA. Some species with a Rare Plant Rank of 3 may also meet the requirements for state listing. Very few plants with a Rare Plant ranking of 4 are eligible for listing but may be locally important and their listing status could be elevated if conditions change. Thus, under the CEQA review process, only CNPS Rank 1 and 2 species are always considered since these are the only CNPS species that meet CEQA's definition of "rare" or "endangered." Impacts to Rank 3 and 4 species are not always regarded as significant pursuant to CEQA, but may be included at the lead agency's discretion on a case-by-case basis determined by local rarity, species range, and threats.

The City of Grass Valley General Plan objective 3-COSO focuses on the protection of rare and endangered species, which generally includes CNPS Rank 1 and 2 species. CNPS Rank 3 and 4 plants can be considered "special-status" per CEQA guidelines if they meet one or more of the following criteria, which are some of the criteria CNPS uses to consider a species "locally rare": a) the project area is considered a type locality (i.e., the area from which the plant was originally described) for that species; b) populations are at the periphery of a species range; c) occurrences are in areas where taxon is especially uncommon or has sustained heavy losses; or d) populations exhibit unusual morphology or occur on unusual substrates.

Table 2-4 presents each of the CNPS Rank 3 and 4 plants known to occur within the project region ("Grass Valley, California" and eight surrounding USGS 7.5 minute quadrangles) and a discussion of whether or not these species would warrant inclusion in the CEQA review based on the criteria discussed above.

Table 2-4: CNPS Rank 3 and 4 Plants Warrants for Inclusion in CEQA Review

Name	CNPS Rank	Discussion	Inclusion in CEQA Review Warranted. (Y/N)
Congdon's onion (*Allium sanbornii* var. *congdonii*)	4.3	Type locality in Placer County. Site not on edge of range. Grows on serpentine soils, but not restricted to ultra-basic soils at the site.	No
Sanborn's onion (*Allium sanbornii* var. *sanbornii*)	4.2	Type locality in Yuba County. Site not on edge of range. Grows on serpentine soils, but not restricted to ultra-basic soils at the site.	No
True's manzanita (*Arctostaphylos mewukka ssp. truei*)	4.2	Not known from Nevada County. No potential to occur.	No

Name	CNPS Rank	Discussion	Inclusion in CEQA Review Warranted. (Y/N)
Mexican mosquito fern (*Azolla microphylla*)	4.2	No suitable marsh habitat onsite. No potential to occur.	No
Sierra foothills brodiaea (*Brodiaea sierrae*)	4.3	Type locality in Butte County. Site is at the southern end of range, but abundant collections in the area indicate no threat of local extinction. Associated with serpentine and gabbroic soils but not restricted.	No
Brandigee's clarkia (*Clarkia biloba* ssp. *brandegeeae*)	4.2	Earliest collections from Placer, Nevada, and El Dorado counties. Site is not on edge of range. Not restricted in habitat.	No
Streambank spring beaty (*Claytonia parviflora* ssp. *grandiflora*)	4.2	No suitable cismontane woodland with rocky substrates onsite. No potential to occur.	No
California lady's slipper (*Cypripedium californicum*)	4.2	No suitable seep and streambank habitat onsite. No potential to occur.	No
Clustered lady's slipper (Clypripedium californicum)	4.2	No suitable seep and streambank habitat onsite. No potential to occur.	No
California pitcherplant (Darlingtonia californica)	4.2	No suitable serpentine seeps onsite. No potential to occur.	No
Northern Sierra daisy (*Erigeron petrophilus* var. *sierrensis*)	4.3	Type locality unknown but not in Nevada County. Site not on edge of range. Known from one collection in Nevada County, north of Soda Springs. No potential to occur.	No
Butte County fritillary (*Fritillaria eastwoodiae*)	3.2	Type locality in Butte County. Site not on edge of range. No restrictive soils or habitat.	No
Dubious pea (*Lathyrus sulphureus* var. *argillaceus*)	3	Type locality in Tehama County. Occurs throughout the foothills. Site not on edge of range. No restrictive soils or habitat.	No
Humboldt lily (*Lilium humboldtii* ssp. *humboldtii*)	4.2	Type locality unknown; earliest collections from Sonoma, Modoc, and Butte counties. Site not on edge of range. No restrictive soils or habitat.	No
Elongate copper moss (*Mielichhoferia elongata*)	4.3	Information on mosses limited. Known from collections throughout central and northern California. Site not on edge of range. Restricted to metamorphic rock, but in a variety of habitat types.	No
Bacigalupi's yampah (*Perideridia bacigalupii*)	4.2	Type locality north of Nevada City in Nevada County. Known from multiple counties in the Sierra Nevada foothills. Site not on edge of range. Associated with serpentine soils, which occur throughout its range.	No
Cedar Crest popcornflower (*Plagiobothrys glyptocarpus var. modestus*)	3	No cismontane woodland or valley grassland present onsite. No potential to occur.	No
Giant checkerbloom (*Sidalcea stipularis*)	4.3	No suitable meadow or seep habitat onsite. No potential to occur.	No

Name	CNPS Rank	Discussion	Inclusion in CEQA Review Warranted. (Y/N)
Long-fruit jewel-flower (*Streptanthus longisiliquus*)	4.3	No occurrences or collections in Nevada County. The site is outside the known geographic range for this species. No potential to occur.	No

S-6 The comment states that the Biological Technical Report acknowledges that dubious pea has potential to occur within the project site and that dubious pea ranks as somewhere between "imperiled" and "critically imperiled" and thus warrants consideration in the Draft EIR under CEQA Guidelines Section 15380.

As shown in Table 2-4, dubious pea is not expected to occur at the project site because the site is well-outside this species' known range. As noted in Response to Comment S-4, the Biological Technical Report references to dubious pea have been removed; the Draft EIR is correct to identify Follett's monardella as a special-status plant with potential to occur at the project site

S-7 The comment states that an unidentifiable lily was observed within the ponderosa pine forest onsite and that this could have been the Humboldt lily, which is a Rank 4 plant. The comment states that because the lily was not identified to the taxonomic level, the EIR must assume that the Humboldt lily is present and analyze cumulative impacts to that species.

As shown in Table 2-4, the Humboldt lily has a CNPS Rank 4.2, which is not considered a special-status species under the criteria identified in Response to Comment S-5. Further, as shown in Table 2-4, the Humboldt lily is not expected to occur at the project site because the site is well-outside the known range for this species.

S-8 The comment states that protocol-level botanical surveys were not conducted at the project site and thus the EIR can only speculate about project impacts to special-status plants. The comment states that the Draft EIR and Biological Technical Report do not disclose the relative severity of potential impacts to Stebbins' morning-glory if it is present within the project site. The comment notes that this plant is exceptionally rare and limited to gabbro and serpentine-derived soils in El Dorado and Nevada counties.

Page 6-7 of the Draft EIR recognizes the rarity of Stebbin's morning-glory, stating that this species "has been found in only two areas of El Dorado and Nevada counties" and that the CRPR rank of 1B.1 indicates "that this species is seriously endangered in California." The comment states that impacts to this species may be unmitigable but does not provide evidence or analysis to support this conclusion. As discussed in Response to Comment G-3, the project site was surveyed at a floristic level for the presence of special-status plants during preparation of the Draft EIR, and none were identified onsite. This included two site surveys – one in March 2016, which is a time of year during which the special status plants with potential to occur onsite would not be identifiable, and one in July 2016, which is a period during which many of the special status plants with potential to occur onsite would have been present and

identifiable. No Stebbins' morning-glory was identified onsite during the July survey. Thus appropriate and industry-standard methods were used to identify the potential presence of special-status plants as part of the environmental review. However, due to the amount of time that will pass between these site surveys and project construction, it is necessary for the survey to be repeated as required by Mitigation Measure 6a. Mitigation Measure 6a has been updated to clarify the requirements for this survey, including that protocol-level rare plant surveys shall be performed prior to construction and when potentially occurring special-status plant species are evident and identifiable, and the surveys will be floristic in nature and will identify all species to a taxonomic level sufficient to determine rarity. Mitigation Measure 6a also states that the City must consult with CDFW and/or USFWS if federally-listed or state-listed plants are observed onsite, and obtain concurrence from the applicable agency for any avoidance, minimization, and mitigation measures. However, it is important to note that unless a plant is State or federally listed as Rare, Threatened, or endangered, prior approval from USFWS or CDFW is not required. Completion of the plant survey and avoidance and compensatory actions required under Mitigation Measure 6a would ensure that impacts to special status plant species are reduced to a less than significant level.

S-9 The comment references text in the Draft EIR describing survey techniques used to assess the potential of the site to support special-status animal species and states that specialized techniques are generally required to identify Blainville's horned lizard and northern goshawk

Dudek biologists determined that there is low potential for these species based on the suitability of available habitat. Thus, further specialized survey techniques were not necessary. Additionally, Mitigation Measure 6b requires completion of a pre-construction survey for Blainville's horned lizard and Mitigation Measure 6c requires completion of a pre-construction survey for nesting birds. Both measures also include requirements to avoid impacts to these species and/or relocate them when appropriate and feasible. Thus while the potential for these species to occur onsite is low, the Draft EIR mitigation measures would ensure that if they do occur onsite, impacts to them would be avoided.

S-10 The comment summarizes information provided in the Draft EIR regarding aquatic habitats and jurisdictional waters and state that the information in insufficient and confusing because the Biological Technical Report identifies four potentially jurisdictional features onsite but the EIR only addresses one of these features – the intermittent drainage.

Section 6.1.4 of the Biological Technical Report states that the erosional features, cement-lined drainage, and upland swale onsite are not likely jurisdictional under state or federal water law. Thus, they are not discussed further in the EIR as potentially jurisdictional features. The seasonal wetland is discussed in the Draft EIR in Impact 6-3 on pages 6-19 and 6-20, along with the intermittent drainage.

S-11 The comment states that the Draft EIR misrepresents the findings of the Biological Technical Report regarding these features because the technical report only states that the features are unlikely to be jurisdictional. The comment states that the City did not obtain a jurisdictional

determination from the U.S. Army Corps of Engineers (Corps), which is recommended in the technical report.

Consistent with the Biological Technical Report, Draft EIR Section 6.1 identifies that the erosional features and depression are considered unlikely to fall within the jurisdiction of the Corps because they "are only periodically inundated and tend to remain inundated for short periods." As discussed in Response to Comment R-18, Draft EIR pages 6-8 and 6-9 provide a description of the hydrologic features within the project site and their likely jurisdictional status. The methodology used for mapping the features followed the criteria established by the U.S. Army Corps of Engineers, the Regional Water Quality Control Board, and the California Department of Fish and Wildlife. Thus the resources have been mapped, as shown in Draft EIR Figure 6-2, and assessed sufficient to support identification of potential impacts to them, as presented in Impact 6-3. The Draft EIR does not defer identification of the resources, evaluation of the impacts, or mitigation for the impact.

As discussed under Impact 6-3, Mitigation Measure 6f requires the project applicant to complete a jurisdictional delineation to verify the extent of wetlands within the project site and to complete compensatory mitigation for any wetland impacts. Thus, the Draft EIR assessment of potential wetland impacts is consistent with the Biological Technical Report and implementation of Mitigation Measure 6f would ensure that the full extent of federally-protected wetlands are identified and impacts to those features are mitigated to a less than significant level.

S-12 The comment states that the Draft EIR fails to discuss features that may qualify as waters of the state and/or may be subject to California Fish and Game Code Section 1602.

The discussion of potential impacts and mitigation for state and federal wetland and non-wetland waters has been updated to include those features that are potentially jurisdictional under Clean Water Act Section 401, California Fish and Game Code Section 1602, and/or the Porter Cologne Act, as shown in Chapter 3, Draft EIR Text Revisions. Specifically, the seasonal wetland is expected to fall within the jurisdiction of the Regional Water Quality Control Board (RWQCB) as a water of the state and the intermittent drainage is expected to fall within the jurisdiction of the RWQCB and California Department of Fish and Wildlife. This does not alter the conclusions of the Draft EIR regarding the project's potential to impact such resources.

S-13 The comment states that Mitigation Measure 6a is not sufficient to avoid or reduce impacts to special status plant species because it does not define what constitutes a "qualified biologist."

As stated in Response to Comment S-4, Mitigation Measure 6a has been amended, as shown in Chapter 3, Draft EIR Text Revisions. The amendments to this measure include defining what constitutes a "qualified biologist."

S-14 The comment states that it is difficult for biologists to predict when special-status plants are evident and identifiable and that CDFW and USFWS survey protocols describe the need to visit reference sites to confirm species are evident and identifiable.

As stated in Response to Comment S-4, preparation of the Biological Technical Report and Draft EIR included a site visit and floristic survey in July 2016, when special-status plant species would be evident and identifiable. Additionally, Mitigation Measure 6a has been amended, as shown in Chapter 3, Draft EIR Text Revisions. The amendments to this measure include providing additional definition of the survey protocols to be used.

S-15 The comment states that Mitigation Measure 6a is insufficient because it does not include a mechanism that would ensure adequacy of the surveys, such as a requirement for the biologist to prepare a survey report or obtain USFWS and CDFW approval of the survey reports prior to issuance of a grading permit.

As stated in Response to Comment S-4, Mitigation Measure 6a has been amended, as shown in Chapter 3, Draft EIR Text Revisions. The amendments to this measure include defining the reporting requirements. However, unless a plant is State or federally listed as Rare, Threatened, or endangered, prior approval from USFWS or CDFW is not required. Mitigation Measure 6a requires that if a species meeting these requirements is observed during protocol-level surveys, the City must initiate consultation with CDFW and/or USFWS to coordinate avoidance, minimization, and mitigation of impacts to that species.

S-16 The comment quotes Mitigation Measure 6a regarding creating a no-disturbance buffer around special status plant species, stating that it may be infeasible to create such a buffer. The comment also states that such buffers would not prevent significant impacts because the project would cause habitat fragmentation and edge effects.

Mitigation Measure 6a recognizes that creating a no-disturbance buffer may be infeasible and identifies alternative approaches to mitigating impacts to special-status plant species. The project site is an already isolated patch of habitat already surrounded by light industrial, urban, and residential development. Development of the site will not result in further habitat fragmentation as the site is already physically isolated from other blocks of habitat that could potentially support special-status species.

S-17 The comment states that plant populations shift over time, thus creating a no-disturbance buffer zone around the above-ground parts of a plant population would not be effective at protecting that species, in part because it would alter the environmental conditions that allow for seed germination and would create isolated patches of special-status plants.

As stated in Response to Comment S-16, Mitigation Measure 6a recognizes that creating a no-disturbance buffer may be infeasible and identifies alternative approaches to mitigating impacts to special-status plant species and the project site is an already isolated patch of habitat thus any special-status plant populations that may occur onsite are already in an isolated condition. Further, any no disturbance buffer and any other avoidance, minimization and mitigation measures would be tailored to the special-status plant species present, if any are identified during the protocol-level survey to ensure successful and effective implementation of this mitigation measure.

S-18 The comment states that the performance standard identified in Mitigation Measure 6a of ensuring "continued presence of these species in the project region" is too vague.

As stated in Response to Comment S-4, Mitigation Measure 6a has been amended, as shown in Chapter 3, Draft EIR Text Revisions. The amendments to this measure include clarifying this performance standard.

S-19 The comment states that the Draft EIR is inadequate because it does not provide evidence that the proposed actions (such as transplantation) are feasible techniques for the specific plants that would be affected by the project.

As stated in Response to Comment S-17, any avoidance, minimization and mitigation measures would be tailored to the special-status plant species present, if any are identified during the protocol-level survey, to ensure successful and effective implementation of this mitigation measure.

S-20 The comment states that the Draft EIR is inadequate because it does not provide evidence that offsite habitat creation or restoration are feasible techniques for the specific plants that would be affected by the project and that Mitigation Measure 6a fails to identify critical details such as the mitigation ratio, timeline, long-term management, and monitoring and reporting requirements.

As stated in Response to Comment S-17, any avoidance, minimization and mitigation measures would be tailored to the special-status plant species present, if any are identified during the protocol-level survey, to ensure successful and effective implementation of this mitigation measure. In addition, Mitigation Measure 6a has been modified, as shown in Chapter 3, Draft EIR Text Revisions, to provide additional details of the requirements related to offsite mitigation.

S-21 The comment states that the Draft EIR does not demonstrate that conducting protocol-level botanical surveys was impractical or infeasible as part of preparation of the Draft EIR.

As stated in Response to Comment S-4, preparation of the Biological technical Report and Draft EIR included a site visit and floristic survey in July 2016, when special-status plant species would be evident and identifiable.

S-22 The comment states that the Draft EIR analysis of and mitigation for impacts to special-status animal species is inadequate because Mitigation Measures 6b through 6d provide avoidance and minimization measures but do not address habitat loss and degradation, which are the primary threats to both Blainville's horned lizard and northern goshawk. The comment also states that Mitigation Measure 6b does not define the methodology to be used to identify Blainville's horned lizard, which is necessary because horned lizards are often buried in sand and impossible to located visually. The comment concludes that the Draft EIR should recognize that salvage and relocation attempts will not prevent all horned lizards from being killed during project construction.

While there is no specific required survey protocol for Blainsville's horned lizard, there are best practices for survey timing and intensity. For example, surveys and trapping efforts should be carried out when this species is most active and when detection is most likely. Additionally, daily checks before grading in suitable habitat will increase the likelihood that this species will be detected and successfully protected. Mitigation Measure 6b is consistent with industry-standard approaches to avoiding and minimizing impacts to this species. To ensure Mitigation Measure 6b is implemented effectively, modifications to that measure have been made to require that a survey plan be developed in consultation with CDFW and a relocation plan be developed in consultation with CDFW if this species is identified onsite. The revised text of Mitigation Measure 6b is shown in Chapter 3, Draft EIR Text Revisions.

S-23 The comment states that Mitigation Measure 6b should identify the size of the no-disturbance buffer around horned lizards and thus the buffer zone may be insufficient to avoid impacts to the species. The comment states that the no-disturbance buffer must encompass each individual's home range, which does not appear to be feasible given the extent of the proposed development activities within the project site.

As amended, Mitigation Measure 6b requires that the size of any no-disturbance buffer be established in consultation with CDFW. Further, it is not necessary to ensure that the no-disturbance buffer encompasses the complete home range of an individual, as long as the buffer incorporates sufficient area and habitat characteristics to sustain the individual during construction.

S-24 The comment states that the Draft EIR fails to evaluate the long-term impacts to lizards that can be avoided by no-disturbance buffers because this species will not persist at the size after development if their islands of habitat are surrounded by developed features.

The project site is an already isolated patch of habitat already surrounded by light industrial, urban, and residential development. Development of the site will not result in further habitat fragmentation. Thus if the Blainville's horned lizard is present onsite, the proposed development would not further isolate these individuals from suitable habitat.

S-25 The comment states that the Draft EIR fails to incorporate mitigation for lizards that cannot be avoided, other than consultation with CDFW to determine if relocation is appropriate. The comment references a prior study of amphibian and reptile relocation efforts that found these efforts have not demonstrated success as conservation techniques. The comment states that Mitigation Measure 6b is not sufficient to ensure that project impacts to this species would be less than significant.

As noted in Response to Comment S-23, Mitigation Measure 6b is consistent with industry-standard approaches to avoiding and minimizing impacts to Blainville's horned lizard. To ensure Mitigation Measure 6b is implemented effectively, modifications to that measure have been made to require that a survey plan be developed in consultation with CDFW and a relocation plan be developed in consultation with CDFW if this species is identified onsite. The revised text of Mitigation Measure 6b is shown in chapter 3, Draft EIR Text Revisions.

S-26 The comment states that Mitigation Measure 6b does not identify alternate methods to reduce or avoid impacts if CDFW determines that relocation is not appropriate.

As noted in Response to Comment S-23, Mitigation Measure 6b is consistent with industry-standard approaches to avoiding and minimizing impacts to Blainville's horned lizard. While translocation and relocation of reptile species can have mixed results, and often fail, there are general measures that will increase the likelihood of success. For example, many programs fail due to the lack of high quality habitat for the species at recipient sites (McCoy et al 2014). Mitigation Measure 6b specifies that relocation of any potentially present lizards will be to appropriate receptor sites as determined occur in consultation with CDFW. This will ensure that conditions are as similar to the donor site as possible. The revised text of Mitigation Measure 6b is shown in chapter 3, Draft EIR Text Revisions.

S-27 The comment quotes from Mitigation Measure 6c and states that finding bird nests can be extremely difficult, is labor intensive, and requires a variety of search techniques.

The comment does not identify any inaccuracies or inadequacies in the Draft EIR or address the environmental effects of the project. It is noted that nesting bird surveys do not depend entirely on locating actual nests; this is just one of several metrics used to assess the likelihood of a site to support nesting birds. Visual observations of bird activity and audio observations of bird calls are also important factors in a nesting survey.

S-28 The comment states that Mitigation Measure 6c is not sufficient because it requires only a single pre-construction survey for bird nests, and does not establish standards for the survey techniques, minimum level of effort, and time of day that surveys would occur.

Mitigation Measure 6c has been modified to add clarification of the survey protocols, including a requirement for additional surveys if the construction site remains inactive for more than one month during the breeding season, as shown in Chapter 3, Draft EIR Text Revisions.

S-29 The comment states that the Draft EIR acknowledges the potential for northern goshawk nests to occur at the project site but that the Draft EIR does not require use of the U.S. Forest Service protocol for locating goshawk nests.

Mitigation Measure 6c has been modified to add clarification of the survey protocols as shown in Chapter 3, Draft EIR Text Revisions.

S-30 The comment states that Mitigation Measure 6c is not sufficient because it does not define the size of avoidance buffers necessary to protect nesting birds and does not define any minimum standards for the qualified biologist conducting the surveys.

Mitigation Measure 6c has been modified to add clarification of the survey protocols and avoidance buffers, as shown in Chapter 3, Draft EIR Text Revisions.

S-31 The comment quotes from Mitigation Measure 6e and states that incorporating compensatory mitigation for impacts to the McNab cypress and Fremont cottonwood vegetation communities

would not replace the functions and values of these communities. The comment also states that the Draft EIR does not provide performance standards for on-site mitigation or a mechanism to ensure long-term protection of those communities at the project site.

Mitigation Measure 6e has been modified to add clarification of the potential for on-site mitigation and requirements for off-site mitigation, as shown in Chapter 3, Draft EIR Text Revisions.

S-32 The comment states that there are no mitigation banks for impacts to McNab cypress woodland and cottonwood forest and the Draft EIR needs to provide additional information on how Mitigation Measure 6e would be implemented.

Mitigation Measure 6e has been modified to add clarification of the potential for on-site mitigation and requirements for off-site mitigation, as shown in Chapter 3, Draft EIR Text Revisions.

S-33 The comment states that Mitigation Measure 6e is inadequate because it requires a 1:1 ratio for mitigation of impacts to McNab cypress woodland and cottonwood forest, and this ratio does not account for the temporal loss of these vegetation communities.

Mitigation Measure 6e provides for several mechanisms to avoid, reduce, or compensate for impacts to sensitive vegetation communities. This allows for the project design to be modified to provide greater reduction of on-site impacts and limited on-site habitat restoration if feasible. However, it is anticipated that mitigation for loss of these communities would occur through off-site habitat conservation. This involves conservation of existing habitat, thus no temporal loss would occur.

S-34 The comment states that the Draft EIR analysis of impacts to jurisdictional waters is limited to federally protected wetlands and that the EIR should include analysis of impacts to waters of the state and riparian habitats protected under the California Fish and Game Code. The comment also states that the Draft EIR defers analysis and mitigation for impacts because it does not identify the specific mitigation approach, compensation ratio, monitoring program, and performance standards that would be implemented to ensure that project impacts are reduced to a less-than-significant level. The comment states that the EIR relied impermissibly on compliance with the permitting requirements of other agencies to reach a conclusion that impacts would be less than significant.

Mitigation Measure 6f has been amended to provide clarification of the requirements related to compensatory mitigation, as shown in Chapter 3, Draft EIR Text Revisions. The amendments include specific recommendations for avoiding/minimizing impacts to wetlands, restoration in areas of temporary impacts to wetlands under federal and state jurisdiction, including mechanisms to ensure that no seeding of invasive plant species would occur, defining a minimum ratio for compensatory mitigation and establishing requirements for preservation of compensatory mitigation lands in perpetuity. As noted in the amended Mitigation Measure 6f, the minimum 1:1 mitigation ratio is considered sufficient to reduce project effects to less than

significant because the type of potentially affected jurisdictional features (i.e., ephemeral drainages) are relatively common in the regional context. Furthermore, most effects would likely be temporary because jurisdictional features are anticipated to be relocated on site to maintain hydrology in the project area.

S-35 The comment states that compliance with regulatory permits is not sufficient to ensure that project impacts to wetlands would be less than significant. The comment cites studies that have demonstrated that many compensatory mitigation projects have not achieved the goal of "no net loss" of wetland acres and function.

Mitigation for impacts to wetlands are regularly mitigated through preservation or creation of like habitat. Mitigation Measure 6f has been updated to add clarification of prosed mitigation ratios and assurances, as discussed in Response to Comment S-34 and shown in Chapter 3, Draft EIR Text Revisions.

S-36 The comment states that the Draft EIR does not provide adequate analysis of potential cumulative impacts to biological resources. The comment states that the *Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills* has identified that cumulative impacts to Stebbins' morning glory would be significant. The comment states that if this plant occurs at the project site, the project would have a considerable contribution to the significant cumulative impact.

As defined in Impact 6-7, the geographic scope for consideration of cumulative impacts to biological resources is the City of Grass Valley. The project site is an infill Brownfield site within the City. Stebbin's morning glory was not observed at the project site during July 2016 floristic survey, and is not anticipated to be present. Regardless, Mitigation Measure 6a, which requires that additional botanical surveys must be conducted prior to construction, would provide further protection for federally-listed plant species should they have become established at the site since the original surveys. Mitigation Measure 6a provides an actionable plan to be carried out in consultation with regulatory agencies that will ensure impacts will be mitigated such that the proposed project would not jeopardize the continued existence of this species in the region. Additionally, the site is already highly isolated as a result of neighboring development. Thus, development of the project site will not result in further habitat fragmentation or isolation of habitat. Additionally, the site is already highly isolated as a result of neighboring development. Thus, development of the project site will not result in further habitat fragmentation or isolation of habitat.

S-37 The comment references Grass Valley General Plan objective 1-COSO and states that the project does not comply with the requirements in the General Plan to provide an inventory of sensitive environmental areas and features.

General Plan 1-COSO identifies an objective of the General Plan intended to support attainment of Goal 1-COSG, which states "Provide a balance between development and the natural environment, protecting and properly utilizing Grass Valley's sensitive environmental areas/features, natural resources and open space lands." The goal and objective are specific

to the City's planning documents and overall implementation of the General Plan and do not establish project-specific requirements. However, the Draft EIR meets this objective by describing the sensitive environmental characteristics of the project site (refer to Draft EIR section 6.1).

S-38 The comment references General Plan objective 3-COSO regarding protection of rare and endangered species and states that the Draft EIR recognizes that the project may not be able to avoid impacts to Stebbins morning glory, which is an endangered species.

This General Plan objective is specific to the City's planning documents and overall implementation of the General Plan and does not establish project-specific requirements. As noted previously, it is not expected that Stebbins' morning glory will occur within the project site. However, Mitigation Measure 6a requires that appropriate actions be taken to verify the presence or absence of this species. Further, this measure has been amended as presented in Chapter 3, Draft EIR Text Revisions to provide feasible and actionable plans for the contingency that special-status species are subsequently found in the project site prior to development. Thus Mitigation Measure 6a is sufficient to avoid or mitigate potential impacts to special-status plant species.

S-39 The comment references General Plan objective 5-COSO regarding protection of wildlife habitat and states that the Draft EIR does not require the project applicant to project any wildlife habitat.

This General Plan objective is specific to the City's planning documents and overall implementation of the General Plan and does not establish project-specific requirements. The project site is an isolated island of semi-natural habitat, which has been altered due to previous mining activity and is surrounded by urban development. The functions and values of wildlife habitat provided by this parcel are limited. The site does not provide wildlife movement corridors as it is bounded by the freeway and previous development. The potential for special-status species to occur onsite is low, and the mitigation measures outlined in the Draft EIR provide adequate protection for special-status wildlife.

S-40 The comment references General Plan objective 6-COSO and states that the Draft EIR does not provide appropriate protection of the natural environment because it defers formulation of specific mitigation details, does not incorporate performance standards, and does not incorporate mitigation monitoring and reporting requirements that would ensure that impacts to sensitive biological resources are effectively mitigated.

As discussed throughout Responses to Comments S-1 through S-39, the mitigation measures outlined in the Draft EIR, along with the clarifications provided in Chapter 3, Draft EIR Text Revisions, provide sufficient environmental protection measures before, during, and after development of the project.

S-41 The comment states that the conclusion that implementation of Mitigation Measures 6a through 6f would ensure that project would result in no net loss of habitat functions or values

is not supported by the Draft EIR analysis because the Draft EIR does not require compensatory mitigation for impacts to special-status species or other sensitive resources.

As discussed throughout Responses to Comments S-1 through S-32, the mitigation measures outlined in the Draft EIR, along with the clarifications provided in Chapter 3, Draft EIR Text Revisions, provide sufficient environmental protection measures before, during, and after development of the project.

INTENTIONALLY LEFT BLANK

Responses to Comment Letter T

Planning Commission Public Hearing
April 16, 2019

T-1 The commenter stated that the project's greatest impact will be to traffic and questioned if ambulance traffic could be delayed.

Ambulance routes would be subject to the same roadway conditions as other vehicles. All traffic impacts associated with both Alternative A and Alternative B are evaluated in Chapter 8, Transportation and Appendix G, Traffic Impact Analysis Report. Under existing plus project conditions, both Alternative A and Alternative B would have less than significant impacts with mitigation. Under cumulative plus project conditions, Alternative B would have less than significant impacts with mitigation while Alternative A would result in a single significant and unavoidable impact due to the vehicle queues at the Dorsey Drive/State Route 20/49 interchange. Additionally, all signal intersections include traffic signal preemption, which would enable all emergency vehicles, including ambulances, to trigger signal changes and reduce travel times.

T-2 The commenter stated that more housing is needed but that traffic is already difficult on Catherine Lane, East Main Street and near the hospital.

All traffic impacts associated with both Alternative A and Alternative B are evaluated in Chapter 8, Transportation and Appendix G, Traffic Impact Analysis Report. Under existing plus project conditions, both Alternative A and Alternative B would have less than significant impacts with mitigation. Under cumulative plus project conditions, Alternative B would have less than significant impacts with mitigation while Alternative A would result in a single significant and unavoidable impact due to the vehicle queues at the Dorsey Drive/State Route 20/49 interchange.

T-3 The commenter stated that the project would create a third downtown, which may not be a realistic goal; noted that providing market rate housing does not mean that housing units would be affordable; requested clarification of the timing of the economic assessment and related data; and questioned the ability of the project to capture the area's $200 million in sales leakage.

As discussed in Response to Comment K-1, the project site is currently designated Business Park under the General Plan and zoned Corporate Business Park, and the General Plan, including the Housing Element, does not assume any residential development on the project site. Because the project site is not assumed to support any amount of affordable housing, the lack of a commitment for the project to include affordable housing does not represent a conflict with the Housing Element and the Draft EIR correctly concludes that the project would not result in a significant impact associated with housing affordability.

Draft EIR Appendix D contains the Dorsey Marketplace Economic Analysis which found that, "the Dorsey Marketplace project would not depend on cannibalizing from existing retail establishments in Grass Valley" and that "a reasonable shift in market area retail spending patterns in the near term, combined with moderate growth in the market area over time, provide ample support for the proposed increase in the city's retail inventory." Thus it is reasonable to expect that the commercial space within the proposed project would be capable of capturing a portion of the area's sales leakage.

The Economic Analysis was completed July 16, 2016 and was completed using industry-standards methodologies. As noted in the Economic Analysis and Draft EIR Chapter 3, Land Use (page 3-10), the Economic Analysis incorporates information prepared by consultants retained by the City in support of development and implementation of the Economic Development Strategy – a Market Overview (Buxton 2010) and a Retail Research Report (Chabin Concepts 2013).

T-4 The commenter stated that solar panels should be installed as part of the project and raised concern that the requirement for the residential buildings to be pre-plumbed for solar may not work in a three story building.

The proposed project will comply with the California Building Code. As reflected in the draft EIR, the 2016 Building Code requires that the buildings be pre-plumbed and structurally engineered to support solar panels. However, projects that obtain building permits on or after January 1, 2020 must meet the 2019 Building Code, which requires installation of solar panels. Rooftop solar panels can be used on buildings that are multiple stories high, thus having the proposed residential and non-residential structures pre-plumbed and structurally engineered to support solar panels (as required under the 2016 Building Code) and installing the solar panels (as required under the 2019 Building Code) is considered feasible. Mitigation Measure 11a includes a wide range of requirements that would reduce energy usage from both the residential and non-residential components of the project.

T-5 The commenter stated that considering other projects anticipated to be developed, such as the 700 dwelling units and retail within the Loma Rica Ranch Specific Plan area, there is no need for the Dorsey Marketplace project.

The comment does not address the project's environmental effects or the adequacy and accuracy of the EIR. The project's cumulative impacts are evaluated throughout Draft EIR chapters 3 through 16. As stated in Draft EIR Chapter 1, the EIR is intended to be an informational document and does not recommend whether or not the project is needed or should be approved.

T-6 The commenter stated that the meeting was supposed to be an informational meeting and there was not enough information provided to understand the proposed project.

A complete project description is provided in Chapter 3 of the Draft EIR. The comment does not address the project's environmental effects or question the accuracy or adequacy of the EIR. No response is required.

T-7 The commenter stated that the Grass Valley Energy Action Plan identifies a goal of zero net energy for residential by 2020 and commercial by 2030, that constructing buildings to be "solar ready" does not meet that goal, and that installing solar panels has been shown to be feasible and cost effective. The commenter also stated that housing affordability is very important.

The City's Energy Action Plan was adopted November 2018. A summary of the Energy Action Plan has been added to Section 11.2 of the Draft EIR, as shown in Chapter 3, Draft EIR Text Revisions.

The California Building Code requires that single-family residences constructed in 2020 or later and non-residential buildings constructed in 2030 or later must be zero-net energy. The comment is correct that these standards are reflected in the City's Energy Action Plan. Refer to Responses to Comments L-9 and T-4 regarding installation of solar panels. Refer to Responses to Comments K-1 and T-3 regarding housing affordability.

T-8 The commenter stated that they don't like replacing fields and trees in Grass Valley with asphalt and questioned if there is any requirement for trails and open space.

The comment does not identify any inaccuracies or inadequacies in the Draft EIR. All impacts associated with the increase in impervious surfaces and the removal of trees are evaluated in Chapter 5, Aesthetics, Chapter 6, Biological Resources, Chapter 12, Geology, Soils, Seismicity, and Paleontology, and Chapter 13, Hydrology and Water Quality.

The project's consistency with the City's development standards established in the Grass Valley Municipal Code and General Plan is evaluated under Draft EIR Impact 3-1. The City's standards do not require provision of trails or open space within Central Business District or Multiple Dwelling Residential zone districts. Both Alternative A and Alternative B would include a trail/path connecting to the apartment complex to the east, to support pedestrian activity between those existing residences and the proposed commercial area. Additionally, both alternatives include a dog park, tot lot, and pool as part of the proposed multifamily residential area.

As discussed in Response to Comment K-11, Grass Valley Municipal Code section 17.86.030 establishes the City's requirements for dedication of land and/or the payment of fees to the City for park and recreational purposes as a condition of the approval of a Tentative Map, consistent with the Quimby Act. Draft EIR Impact 14-13 concludes that both Alternative A and Alternative B would have a less than significant impact to recreational facilities and services after payment of park fees as required by Municipal Code section 17.86.030.

T-9 The commenter questioned whether the retail uses within the project would compete with Grass Valley and Nevada City businesses and questioned whether it would be local-serving or a destination-shopping venue.

Draft EIR Appendix D contains the Dorsey Marketplace Economic Analysis which found that, "the Dorsey Marketplace project would not depend on cannibalizing from existing retail establishments in Grass Valley" and that "a reasonable shift in market area retail spending patterns in the near term, combined with moderate growth in the market area over time, provide ample support for the proposed increase in the city's retail inventory". Therefore, it is reasonable to expect that the construction of the proposed project would not compete with existing small businesses to the extent that could lead to an adverse environmental effect. Additionally, it is reasonable to expect that the commercial space within the proposed project would be capable of capturing a portion of the area's sales leakage by serving a local customer base.

T-10 The commenter suggested that providing fast food restaurants in proximity to housing would contribute to unhealthy eating habits.

Under both Alternative A and Alternative B, the project would include four small retail pads with drive-through lanes. These could support fast food or other uses, such as banks and coffee shops that utilize drive-through lanes. While public health considerations are an important concern, they do not directly relate to the project's physical effects on the environment and thus are not subject to analysis under CEQA.

T-11 The commenter stated that a previous affordable housing project on Bennett Street wasn't approved.

The comment does not address the project's environmental effects or the accuracy or adequacy of the EIR. The Draft EIR evaluates the project as proposed and is unrelated to the unapproved project on Bennet Street. Refer to Responses to Comments K-1 and T-3 regarding housing affordability.

T-12 The commenter stated that traffic is unmanageable and that the City was built for horses rather than SUVs.

The comment does not address the accuracy or adequacy of the Draft EIR. All traffic impacts associated with both Alternative A and Alternative B are evaluated in Chapter 8, Transportation and Appendix G, Traffic Impact Analysis Report. Under existing plus project conditions, both Alternative A and Alternative B would have less than significant impacts with mitigation. Under cumulative plus project conditions, Alternative B would have less than significant impacts with mitigation while Alternative A would result in a single significant and unavoidable impact due to the vehicle queues at the Dorsey Drive/State Route 20/49 interchange.

T-13 The commenter stated that it is important to shop locally but there is insufficient parking in local shopping areas.

The comment does not address the project's environmental effects or the adequacy or accuracy of the Draft EIR. It is noted that the proposed project would comply with the City's parking standards. Site plans for Alternative A and Alternative B are provided in Draft EIR Figures 2-4 and 2-5. The site plans identify the proposed layout of parking areas, the number of parking spaces required under City code, and the proposed number of parking spaces. The site plans also demonstrate that landscaping and pedestrian walkways would be providing throughout the parking areas.

T-14 The commenter stated that there are too many expensive homes in the area which will lead to an inability to find workers for the proposed retail and restaurant space.

Under Alternative A, the proposed project includes 90 multifamily residential units; under Alternative B the project includes 172 multifamily residential units. These dwelling units would range in size from one to three bedrooms and from approximately 1,013 to 1,600 square feet. They would be offered for rent at market rates. As discussed in Draft EIR Impact 4-3, the proposed residences "could satisfy a portion of the City's need for 100 moderate and 220 above-moderate-income housing units." Further, as stated in Impact 4-1, the proposed project could provide housing for approximately 184 residents under Alternative A and 351 residents under Alternative B. Given the new population that would be supported by the project and the existing unemployment rate in Nevada County, it is reasonable to expect that businesses at the project site would be capable of finding employees.

T-15 The commenter stated that already too many empty buildings and the project is not needed.

As stated in Draft EIR Chapter 1, the EIR is intended to be an informational document and does not recommend whether or not the project is needed or should be approved. Impacts on other businesses are not an environmental issue unless they would contribute to a physical environmental effect such as blight. Based on the Dorsey Marketplace Economic Analysis (Appendix D), it is reasonable to expect that the construction of the proposed project would not lead to empty storefronts and stress on small businesses that could lead to an adverse environmental effect. Additionally the Economic Analysis concluded that "a reasonable shift in market area retail spending patterns in the near term, combined with moderate growth in the market area over time, provide ample support for the proposed increase in the city's retail inventory."

T-16 The commenter expressed concern that there is a lack of housing affordable to young adults. The commenter suggested that the project should include a botanical garden and tahoe-like shops and should support free public gatherings. The commenter also stated that the project should be consistent with the theme of Grass Valley and that the City needs new housing.

Refer to Response to Comment T-14 regarding the provision of housing as part of the project and the potential for the residential units to support the City's housing and affordability goals. The features suggested by the commenter do not relate to the project's environmental effects and thus are not subject to consideration in the EIR. Draft EIR Chapter 5 evaluates the project's

potential aesthetic effects and provides figures showing conceptual renderings and elevations for the proposed project.

T-17 The commenter questioned whether economic impacts were addressed.

Draft EIR Appendix D contains the Dorsey Marketplace Economic Analysis which found that, "the Dorsey Marketplace project would not depend on cannibalizing from existing retail establishments in Grass Valley" and that "a reasonable shift in market area retail spending patterns in the near term, combined with moderate growth in the market area over time, provide ample support for the proposed increase in the city's retail inventory."

T-18 The commenter stated agreement with previous comments regarding solar, trails, and fast food pads.

Refer to Responses to Comments T-4 and T-7 regarding solar panels, Response to Comment T-8 regarding open space and trails, and Response to Comment T-10 regarding fast food pads.

T-19 The commenter questioned if a business survey was conducted and the project's economic impacts were considered. The commenter stated that new development leads to the death of the old town and creates blight.

Impacts on other businesses is not an environmental issue unless it would contribute to a physical environmental effect such as blight. Draft EIR Appendix D contains the Dorsey Marketplace Economic Analysis which found that, "the Dorsey Marketplace project would not depend on cannibalizing from existing retail establishments in Grass Valley" and that "a reasonable shift in market area retail spending patterns in the near term, combined with moderate growth in the market area over time, provide ample support for the proposed increase in the city's retail inventory". Therefore, it is reasonable to expect that the construction of the proposed project would not lead to empty storefronts and stress on small businesses that could lead to an adverse environmental effect.

T-20 The commenter noted he is a member of the Greater Grass Valley Chamber of Commerce and that housing and business development are perennial issues for the region. The commenter stated that attracting young talent to the area is a good goal and expressed support for the proposed project stating that the proposed mixture of retail, commercial, and residential uses would support young families.

The comment expresses support for the proposed project and does not address the project's environmental effects or the accuracy or adequacy of the EIR. No response is required.

EXHIBIT 7

DUDEK

31878 CAMINO CAPISTRANO #200
SAN JUAN CAPISTRANO, CALIFORNIA 92675
T 949.450.2525 F 949.450.2626

MEMORANDUM

To: Guy Houston, Valley Capital Realty and Mortgage
From: Matthew Morales, Dudek
Subject: 11249 Dublin Canyon Road – Health Risk Assessment
Date: August 4, 2015
Attachments: 1 Health Risk Screening Interpolation
cc: Jennifer Reed, Dudek

This memorandum evaluates the anticipated health impacts resulting from roadways and stationary sources in the vicinity of the 11249 Dublin Canyon Road project (project), which involves a three-lot subdivision of an existing parcel. The project would result in the entitlement of two new single-family residences on lots one and three, adjacent to an existing single-family residence and guest house on lot two. The project site is approximately 2.91 acres and located south of Dublin Canyon Road, near the intersection with Laurel Creek Drive, in the City of Pleasanton (City), California. The proposed project is located within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). This assessment is based on significance thresholds and methodologies in the BAAQMD's *California Environmental Quality Act Air Quality Guidelines* (BAAQMD Guidelines; BAAQMD 2011a).

1.0 INTRODUCTION

The proposed project involves the subdivision of an existing parcel into three lots and the entitlement of two new single-family homes on a site located south of Dublin Canyon Road and west of Laurel Creek Drive. Consistent with BAAQMD guidance, this memorandum evaluates exposure of residents of the proposed project to toxic air contaminants (TAC) from "major roadways" and stationary sources (e.g., gasoline dispensing facilities, manufacturing facilities, and emergency generators). A substance released into the air is considered a TAC if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic noncancer health effects. Examples of TACs include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, manufacturing facilities, and laboratories; mobile sources such as automobiles and trucks; and area sources such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects.

Noncarcinogenic effects typically affect one or more target organ systems and may be experienced either on short-term (acute) or long-term (chronic) exposure to a given TAC.

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air pollution-sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005). Future residents of the proposed single-family homes are considered sensitive receptors.

2.0 BAY AREA AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

The BAAQMD Guidelines provide guidance for Bay Area project proponents and the public for determining whether, based on substantial evidence, a project may have a significant effect on the environment under California Public Resources Code, Section 21082.2, or if a project may result in the exposure of sensitive receptors to substantial pollutant concentrations. In early 2012, the BAAQMD was ordered by the Alameda County Superior Court to set aside their air quality thresholds because the district board adopted the thresholds without undergoing CEQA review. The BAAQMD appealed this decision, and the Court of Appeal overturned the Superior Court decision. The appellate court decision, however, has been appealed to the California Supreme Court, which granted a limited review. The Supreme Court has limited review to the following issue: Under what circumstances, if any, does CEQA require an analysis of how existing environmental conditions will impact future residents or users (receptors) of a proposed project? With respect to the proposed project, this review would be related to the potential health impacts on its residents due to TAC emissions associated with major roadways and stationary sources in the vicinity of the project site. As of this date, a decision on this appeal is still pending. In light of these rulings, the BAAQMD is recommending that lead agencies determine their own appropriate air quality thresholds.[1] The air quality analysis below uses the previously-adopted 2011 thresholds of the BAAQMD to determine the potential impacts of the project. While the significance thresholds adopted by BAAQMD in 2011 are not currently recommended by the BAAQMD, these thresholds are based on substantial evidence identified in BAAQMD's 2009 *Justification Report* (BAAQMD 2009) and are therefore used within this document.

[1] http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa

Quantitative health-based thresholds prescribed in the BAAQMD Guidelines are shown in Table 1. Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented in Table 1 are exceeded.

If health impacts would exceed these thresholds, the lead agency must implement feasible mitigation measures to reduce the associated impacts. The project's mitigated impacts are then compared again to the significance thresholds. If a project's impacts exceed the thresholds, the BAAQMD strongly encourages lead agencies to consider project alternatives that could lessen any identified significant impact, including a no project alternative in accordance with the CEQA Guidelines, Section 15126.6(e) (BAAQMD 2011a).

Table 1
Bay Area Air Quality Management District Air Quality
Significance Thresholds for Toxic Air Contaminants

Pollutant	Operational-Related
Risk and Hazards for new sources and receptors (Individual Project)	Compliance with Qualified Community Risk Reduction Plan OR **Increased cancer risk of > 10.0 in 1 million*** **Increased non-cancer risk of > 1.0 Hazard Index[a] (Chronic or Acute)*** **Ambient $PM_{2.5}$ increase: > 0.3 µg/m³ annual average*** Zone of Influence: 1,000-foot radius from property line of source or receptor
Risk and Hazards for new sources and receptors (Cumulative Threshold)	Compliance with Qualified Community Risk Reduction Plan OR **Cancer: > 100 in 1 million (from all local sources)*** **Non-cancer: > 10.0 Hazard Index (from all local sources) (Chronic)*** **$PM_{2.5}$: > 0.8 µg/m³ annual average (from all local sources)*** Zone of Influence: 1,000-foot radius from property line of source or receptor

Source: BAAQMD 2011a.
Notes:
* Emphasis added.
µg/m³ – micrograms per cubic meter

Local Community Risk and Hazard Impacts

Local community risk and hazard impacts are associated with TACs and particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$) because emissions of these pollutants can have significant health impacts at the local level. These thresholds from the BAAQMD Guidelines are intended to apply to projects that would site new permitted or non-permitted sources in proximity to receptors and for projects that would site new sensitive receptors in proximity to permitted or

non-permitted sources of TAC or $PM_{2.5}$ emissions. If impacts due to emissions of TACs or $PM_{2.5}$ would exceed any of the thresholds listed below, the proposed project would result in a significant impact:

- Non-compliance with a Community Risk Reduction Plan
- An excess cancer risk level of more than 10 in one million, or a non-cancer (i.e., chronic or acute) hazard index greater than 1.0 would be a significant cumulatively considerable contribution
- An incremental increase of greater than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average $PM_{2.5}$ from a single source would be a significant cumulatively considerable contribution.

A project would result in a cumulatively considerable impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000-foot radius from the fenceline of a source, or from the location of a receptor, plus the contribution from the project, would exceed any of the following thresholds:

- Non-compliance with a qualified Community Risk Reduction Plan
- An excess cancer risk levels of more than 100 in one million or a chronic non-cancer hazard index (from all local sources) greater than 10.0
- 0.8 $\mu g/m^3$ annual average $PM_{2.5}$.

3.0 ANALYSIS AND FINDINGS

The BAAQMD recommends that a lead agency identify all TAC and $PM_{2.5}$ sources located within a 1,000-foot radius of the proposed project site. A lead agency should enlarge the 1,000-foot radius on a case-by-case basis if an unusually large source (or sources) of risk or hazardous emissions that may affect a proposed project is beyond the recommended radius. Permitted sources of TAC and $PM_{2.5}$ should be identified and located as should freeways and major (high-volume) roadways (BAAQMD 2011a). BAAQMD has developed a Stationary Source Screening Analysis Tool (BAAQMD 2012a) and a Highway Screening Analysis Tool (BAAQMD 2011b), which are geo-referenced databases of TAC emissions sources throughout San Francisco Bay Area and used for estimating health risks to new sensitive receptors from existing sources.

Based on the BAAQMD guidance, one major roadway with more than 10,000 annual average daily trips (AADT) was identified within the project vicinity: Interstate 580 (I-580). I-580 is approximately 950 feet from the nearest proposed residence on the project site. The estimated

risk and hazard impact values provided by the Highway Screening Analysis Tool were evaluated for two different heights—6 feet and 20 feet—to estimate receptors on the ground floor of a building and the second floor of a building, respectively. Values found in Tables 2 and 3 were estimated by linearly interpolating the distance from the project site to the highway, as described in the BAAQMD's *Recommended Methods for Screening and Modeling Local Risks and Hazards* (BAAQMD 2012b). The screening values for cancer risk, $PM_{2.5}$, acute non-cancer hazard indices, and chronic non-cancer hazard indices for this roadway at 6 and 20 feet are shown in Tables 2 and 3, respectively.

Table 2
Screening Data for Existing Highway at 6-foot Elevation
(within 1,000 feet of the proposed project)

Roadway Segment	Distance to Project Site (feet)	Cancer Risk in 1 million	$PM_{2.5}$ Concentration ($\mu g/m_3$)	Acute Non-Cancer Hazard Indices	Chronic Non-Cancer Hazard Indices
I-580	950	19.7	0.13	0.014	0.016
BAAQMD Individual Screening Threshold		10	0.3	1.0	1.0
Threshold Exceeded?		Yes	No	No	No

Source: BAAQMD 2011b; BAAQMD 2012b.

Table 3
Screening Data for Existing Highway at 20-foot Elevation
(within 1,000 feet of the proposed project)

Roadway Segment	Distance to Project Site (feet)	Cancer Risk in 1 million	$PM_{2.5}$ Concentration ($\mu g/m_3$)	Acute Non-cancer Hazard Indices	Chronic Non-hazard Indices
I-580	950	19.2	0.12	0.014	0.016
BAAQMD Individual Screening Threshold		10	0.3	1.0	1.0
Threshold Exceeded?		Yes	No	No	No

Source: BAAQMD 2011b; BAAQMD 2012b.

As indicated in Table 1, the BAAQMD risk and hazards screening analysis requires that each source's estimated cancer risk, hazard risk, and $PM_{2.5}$ concentration be compared to the single-source thresholds (10 in 1 million for cancer risk, 1.0 for hazard index, and 0.3 $\mu g/m^3$ for $PM_{2.5}$ concentration). The highway would result in individual TAC impacts that would be above the cancer risk threshold, as shown in Tables 2 and 3. Therefore, TAC impacts related to excessive

cancer risk levels would be significant. Impacts related to excessive $PM_{2.5}$ levels and acute and chronic hazard indices would be less than significant.

Based on the BAAQMD Stationary Source Screening Analysis Tool, there are no permitted stationary sources of TACs located within 1,000 feet of the project. Therefore, no significant impacts related to excessive cancer risk levels, $PM_{2.5}$ concentrations, and hazard indices from individual stationary sources within 1,000 feet of the proposed project would occur, and no further analysis is required.

As recommended in the BAAQMD Guidelines for a cumulative health risk assessment, the risk levels from all TAC sources within 1,000 feet of a proposed project should be combined to determine the cumulative risk to nearby sensitive receptors. As indicated previously in Table 1, the BAAQMD risk and hazards screening analysis requires that the combined total of each source's estimated risk and $PM_{2.5}$ concentration be compared to the cumulative thresholds (100 in 1 million for cancer risk, 0.8 $\mu g/m^3$ for $PM_{2.5}$ concentration, and 10.0 for hazard index). According to the BAAQMD Guidelines, a project would have a cumulatively considerable impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000-foot radius from the fenceline of a source, or from the location of a receptor, plus the contribution from the project, exceeds the cumulative thresholds. No other roadways or stationary sources in addition to I-580 were identified within 1,000 feet of the proposed project; therefore, health effects for this major roadway would not be combined with health effects from a permitted stationary source or other sources within the project vicinity to result in cumulative emissions that would be above these thresholds. Therefore, impacts related to cancer risks, non-cancer hazard indices, and $PM_{2.5}$ concentrations from cumulative roadway and permitted stationary sources were not evaluated.

4.0 MITIGATION MEASURES

Consistent with the BAAQMD Guidelines, implementation of mitigation measures were evaluated to ensure that siting of receptors near a major source would be below BAAQMD's significance thresholds and impacts related to community risk and hazards from placement of sensitive receptors proximate to major sources of air pollution would be less than significant (BAAQMD 2011a).

The BAAQMD Guidelines also recommend that projects install and maintain air filtration systems as mitigation. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers reported the particle-size removal efficiency for Minimum Efficiency Reporting Value 13 (MERV 13) filters of 90% for particles ranging from 1 to 3 micrometers, and less than 75% for particles ranging from 0.3 to 1 micrometer (ASHRAE 2007). In a study conducted by Fisk et al. (2002) on the performance and costs of particulate air filtration technologies, it was shown that MERV 13 (ASHRAE Dust Spot 85%) filters provide an 80% or greater reduction of outdoor

fine particulate matter, such as diesel particulate matter (DPM), if the ventilation systems are operated with one air exchange per hour of outside air and four air exchanges per hour of recirculated air (Fisk et al. 2002). For our analysis, Dudek conservatively assumed a 70% particulate matter reduction for the air filters because substantive evidence supports that MERV 13 filters can provide a 70% or greater reduction of outdoor fine particulate matter. The U.S. Environmental Protection Agency reports that people, on average, spend 90% of their time indoors. Taking into account the time spent outdoors, the overall effectiveness of filtration systems would be about 60% for MERV 13.

For projects that locate sensitive receptors near major sources of DPM, such as freeways, major roadways, railroads, and rail yards, the BAAQMD Guidelines recommend tiered plantings of vegetation such as redwood, deodar cedar, live oak, and oleander to reduce DPM exposure. This recommendation is based on limited studies that have shown that vegetative landscaping can reduce particulate emissions by up to 65% to 85% at lower wind speeds, with greater removal rates expected for ultra-fine particles less than 0.1 micrometers in diameter (Fujii et al. 2008). However, vegetative plantings were not included as mitigation for this project since a thick boundary of existing trees is located between the I-580 freeway and proposed residential units. Reductions in ambient concentrations resulting from existing vegetation was not quantified for the purposes of impact determination because MM HRA-1 through MM HRA-3 mitigate impacts to particulate exposure to a level that is less than significant.

The following mitigation measures would reduce the significant impacts from I-580 to levels below the BAAQMD thresholds:

MM HRA-1 The applicant or its successor shall install an air filtration system on any heating, ventilation, and air conditioning (HVAC) system on the air intakes (i.e., outside air) serving any residential unit located on the project site. The air filtration system shall achieve a reduction of at least 70% of freeway particulate matter emissions, such as can be achieved with a Minimum Efficiency Reporting Value (MERV) 13 air filtration system. Individual residence occupants shall maintain the air filtration system on any HVAC system installed for the specified residential units in accordance with the manufacturer's recommendations for the life of the project.

MM HRA-2 The applicant or its successor shall locate air intake vents on the residential buildings such that they do not face the I-580 freeway and are as far from I-580 as practicable.

MM HRA-3 A City-approved, authorized air quality consultant shall verify the implementation of all necessary measures to reduce toxic air contaminants prior to residential unit occupancy, including the installation of high-efficiency air filtration systems on return vents to reduce ambient particulate matter concentrations.

Implementing Mitigation Measures MM HRA-1, MM HRA-2, and MM HRA-3 would reduce the maximum cancer risks at the closest residence to I-580 to less than significant, as can be seen in Tables 4 and 5. Similarly, non-cancer and $PM_{2.5}$ impacts, while less than significant without mitigation measures, would also be reduced to some extent.

Table 4
Screening Data for Existing Highway (6-foot Elevation) after Mitigation
(within 1,000 feet of the proposed project)

Roadway Segment	Distance to Project Site (feet)	Cancer Risk in 1 million
I-580	950	7.9
BAAQMD Individual Screening Threshold		10
Threshold Exceeded?		No

Note: To estimate the mitigated cancer risk and to be conservative, no reduction was accounted for due to existing tree growth in between I-580 and the proposed residences.

Table 5
Screening Data for Existing Highway (20-foot Elevation) after Mitigation
(within 1,000 feet of the proposed project)

Roadway Segment	Distance to Project Site (feet)	Cancer Risk in 1 million
I-580	950	7.7
BAAQMD Individual Screening Threshold		10
Threshold Exceeded?		No

Note: To estimate the mitigated cancer risk and to be conservative, no reduction was accounted for due to existing tree growth in between I-580 and the proposed residences.

Additionally, although traffic volumes are forecast to increase with time due to growth, vehicular emission factors are expected to decrease with time due to California's statewide regulation to increase fuel efficiency (Assembly Bill (AB) 1493, the Pavley I standard), fleet standards for in-use heavy-duty trucks, and other state and federal regulations aimed at emissions reduction.

If you have any questions regarding this assessment, please feel free to contact Matthew Morales at 916.847.9780 or mmorales@dudek.com and Jennifer Reed at 949.373.8333 or jreed@dudek.com

REFERENCES

ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers Inc.). 2007. *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.* ANSI/ASHRAE Standard 52.2-2007.

BAAQMD (Bay Area Air Quality Management District). 2009. *Revised Draft Options and Justification Report California Environmental Quality Act Thresholds of Significance*, October 2009.

BAAQMD. 2011a. *California Environmental Quality Act Air Quality Guidelines.* Updated May 2011. http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_May%202011_5_3_11.ashx.

BAAQMD. 2011b. Highway Screening Analysis Tool. Tools and Methodology. April 2011. Accessed July 2015. http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines

BAAQMD. 2012a. Stationary Source Screening Analysis Tool. Tools and Methodology. May 2012. Accessed July 2015. http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines

BAAQMD. 2012b. *Recommended Methods for Screening and Modeling Local Risks and Hazards.* http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Risk%20Modeling%20Approach%20May%202012.ashx?la=en.

CARB (California Air Resources Board). 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April 2005. http://www.arb.ca.gov/ch/landuse.htm.

Fisk, W.J., D. Faulkner, J. Palonen, and O. Seppanen. 2002. *Performance and Costs of Particle Air Filtration Technologies.* Indoor Air 12: 223–234.

Fujii, E., J. Lawton, T.A. Cahill, D.E. Barnes, C. Hayes, and N. Spada. 2008. *Removal Rates of Particulate Matter onto Vegetation as a Function of Particle Size.* Final Report to Breathe California of Sacramento-Emigrant Trails Health Effects Task Force (HETF) and Sacramento Metropolitan AQMD. April 30, 2008. Accessed July 2015. http://actrees.org/files/Research/breatheca_vegstudy.pdf.

Memorandum
Subject: 11249 Dublin Canyon Road – Health Risk Assessment

ATTACHMENT 1: HEALTH RISK SCREENING INTERPOLATION

Health Risk Screening - 11249 Dublin Canyon Road Project

Highway 580 (East-West) - 6 foot Elevation

Nearest residence ~950 feet south of I-580

Risk @ 950'=	19.6624	Mitigated Risk	7.86496
PM2.5 @ 950'=	0.1254		
Chronic @ 740'=	0.0162		
Acute @ 740'=	0.014		

Linear Interpolation

Distance	PM2.5	Risk	Chronic	Acute
750	0.155	24.1	0.021	0.014
1000	0.118	18.553	0.016	0.014

Highway 580 (East-West) - 20 foot Elevation

Nearest residence ~950 feet south of I-580

Risk @ 950'=	19.229	Mitigated	7.6916
PM2.5 @ 950'=	0.123	Risk	
Chronic @ 740'=	0.01616		
Acute @ 740'=	0.014		

Linear Interpolation

Distance	PM2.5	Risk	Chronic	Acute
750	0.151	23.477	0.020	0.014
1000	0.116	18.167	0.016	0.014

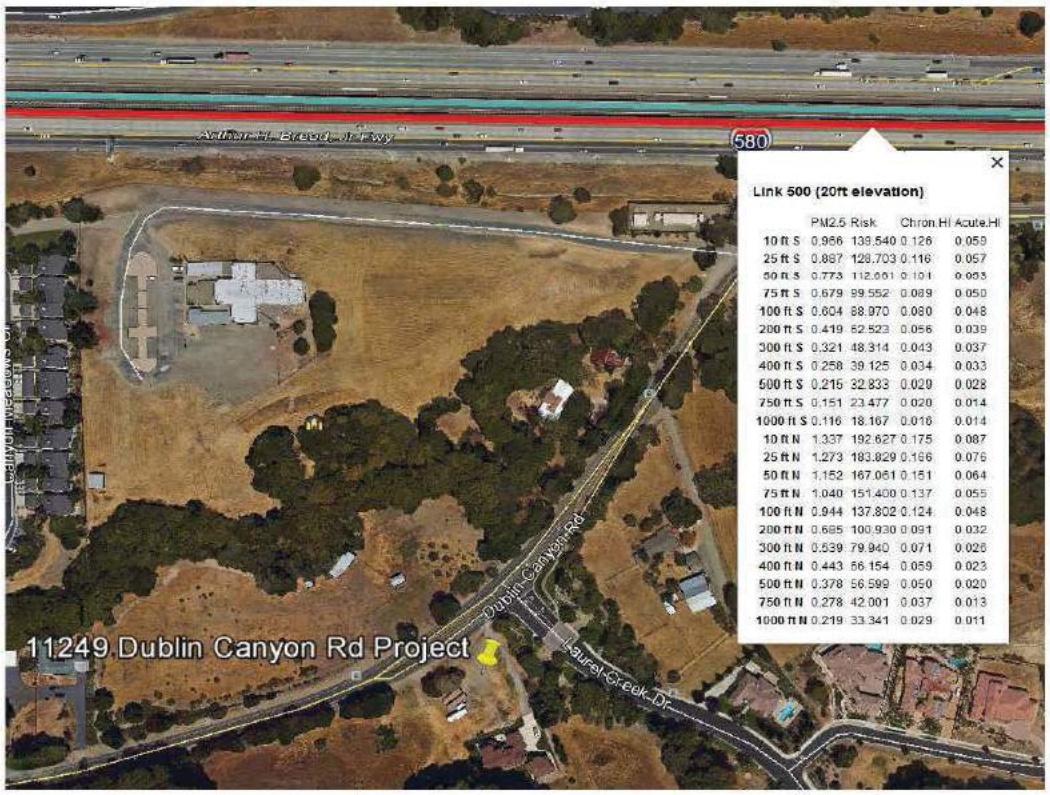


EXHIBIT 8

5. TAC EMISSIONS

5.1 INTRODUCTION

Under the Clean Air Act, toxic air contaminants (TACs) are airborne pollutants that may be expected to result in an increase in mortality or serious illness or which may pose a present or potential hazard to human health. TACs are also referred to as toxic air pollutants or hazardous air pollutants.

A wide range of sources, from industrial plants to households emits TACs. Because it is not practical to eliminate all TACs these compounds are regulated through risk management programs. These programs are designed to eliminate, avoid, or minimize the risk of adverse health effects from exposures to TACs.

A substance becomes a regulated TAC after it is identified by the California Air Resources Board's (ARB) California Air Toxics Program or the U.S. Environmental Protection Agency's (EPA) National Air Toxics Assessments, assessed for its potential for human exposure, and evaluated for its health effects on humans. ARB has listed approximately 200 toxic substances, including those identified by EPA, which are identified on the California Air Toxics Program's TAC List.

The California Health and Safety Code provides the District authority to control emissions from stationary sources[1,2] and to develop clean air strategies for other sources (mobile).[3]

5.1.1 HEALTH EFFECTS

TACs can cause long-term health effects such as cancer, birth defects, neurological damage, or genetic damage; or short-term acute affects such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches. Regulating TACs is important not only because of the severity of their health effects, but also because the health effects can occur with exposure to even small amounts of TACs. TACs are not classified as criteria air pollutants (CAPs) and no ambient air quality standards have been established for them. The effects of TACs can be diverse and their health impacts tend to be local rather than regional; consequently uniform standards for these pollutants have not been established.

TACs can be separated into carcinogens and non-carcinogens based on the nature of the physiological degradation associated with exposure to the pollutant. For regulatory purposes, carcinogens are assumed to have no safe threshold below which health impacts would not occur and cancer risk is expressed as excess cancer cases per one million exposed individuals.

[1] California Health and Safety Code Section 41010
[2] California Health and Safety Code Section 40961
[3] California Health and Safety Code Section 40961

Non-carcinogens differ from carcinogens in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis. Acute and chronic exposure to non-carcinogens is expressed using a Hazard Index (HI), which is the ratio of expected exposure levels to health-acceptable exposure levels. ARB's web page, California Air Toxics Program, provides more detailed information about the history, multi-agency regulation and health effects of TACs.

5.1.2 Concepts in Health Risk

The dose to which receptors are exposed to a TAC is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance(s). Dose is positively correlated with the concentration of a toxic substance, which generally disperses with distance from the emission source under normal meteorological conditions. Dose is also positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for an exposed individual. Thus, the risks estimated for a receptor are higher if a fixed exposure occurs over a longer period. The breathing rate of an exposed individual is also an important factor. For instance, children have higher intake rates on a per kilogram body weight basis and thus receive a higher dose of airborne pollutants.

5.1.3 Trends in Background TAC Levels

The California Almanac of Emissions and Air Quality (Almanac), which is published regularly by ARB, presents the trends of various TAC emissions in California. Currently, the estimated risk from particulate matter emissions from diesel exhaust (diesel PM) is higher than the risk from all other TACs combined, and this TAC poses the most significant risk to California's population. A 2015 study linked California regulations to dramatic declines in cancer risk from exposure to air toxics.

In September 2000, ARB adopted the Diesel Risk Reduction Plan (DRR Plan), which recommends many control measures to reduce the risks associated with diesel PM The DRR plan has been successful in cleaning up existing engines through engine retrofit emission control devices; the adoption stringent standards for new diesel engines; lowered sulfur content of diesel fuel; and implementation of advanced technology emission control devices on diesel engines. ARB estimates that emissions of DPM in 2035 will be less than half those in 2010, even with increasing VMT.[4] In addition to the DRRP, many of the Air Toxic Control Measures that have been promulgated by ARB specifically address diesel PM emissions from a range of sources, including portable engines, cargo handling equipment used at ports, transport refrigeration units, and idling by commercial vehicles and school buses.

[4] http://www.arb.ca.gov/research/diesel/diesel-health.htm

It is important to note these TAC reductions in the context of well-planned mixed-use urban areas. In response to nonattainment conditions with respect to criteria air pollutants (CAP), specifically ozone, land uses within California are being developed with an increased emphasis on planning principles that reduce vehicle miles traveled (VMT) along with energy and water consumption (e.g., smart growth, transit-oriented design). With the passage of Assembly Bill 32 and the associated greenhouse gas (GHG) emissions reduction goals, the implementation of such principles will play an increasingly important role with regards to land use planning as California will need to more efficiently (e.g., less VMT per household) accommodate population and job growth. Though this type of planning proves to effectively reduce regional CAP emissions and GHGs, inherent to the design, receptors are placed in closer proximity to localized sources of pollution (e.g., freeways, rail). Thus, the future TAC reductions discussed above will play an important role in addressing this matter.

5.2 ANALYSIS EXPECTATIONS

The District recommends that CEQA documents analyze potential impacts resulting from exposure of sensitive receptors to high doses of TACs and associated health risk for the circumstances/situations described below. Lead Agencies shall make a concerted effort to obtain detailed project-specific information in order to accurately disclose all potential TAC-related impacts. However, the District recognizes that the level of detail in which this information is available may vary at the time the impact analysis is performed.

These analyses shall include the following:

Construction TACs:

- A discussion of type of construction activities that would occur and the TAC emission sources associated with those activities. This may include the number and types of equipment anticipated to be used during construction. Detailed guidance about construction-generated TACs is provided in section 5.3.1, Construction Activity;
- A significance determination about construction-generated TAC emissions, without mitigation; and
- A discussion of feasible mitigation necessary to reduce construction-generated TACs and whether the reduction is sufficient to reduce impacts to a less-than-significant level.

Operational TACs:

- A discussion of whether the project would locate any permitted or non-permitted sources of TACs in close proximity to existing or future planned receptors;

- If qualitative methodologies for analyzing TAC impacts are not sufficient, a quantitative health risk assessment (HRA) that discloses health risk levels at affected receptors may be necessary. The HRA shall be conducted in consultation with the District and in accordance with acceptable guidance such as that provided by the California Air Pollution Control Officers Association;
- A significance determination about exposure to TACs from project operations without mitigation; and
- A discussion of feasible mitigation necessary to reduce TAC exposure resulting from project operations and whether the reduction would be sufficient to reduce the impact to a less-than-significant level.

More detailed guidance for analyzing TAC impacts is provided below.

5.3 METHODOLOGIES

Methodologies for assessing impacts resulting from diesel PM and airborne asbestos emissions generated by short-term construction activity are discussed below, followed by methodologies for assessing operational TAC emissions.

5.3.1 Construction Activity

Construction activity can result in emissions of particulate matter from diesel exhaust (diesel PM), airborne asbestos resulting from the demolition of asbestos-containing materials, and, in some areas of Sacramento County, earth disturbance activity can result in the release of naturally occurring asbestos (NOA) to the air. These TACs are addressed separately below.

DIESEL PM EXHAUST

The use of off-road heavy-duty diesel equipment for site grading and excavation, paving, and other construction activities results in the generation of diesel PM emissions, which was identified as a TAC by ARB in 1998.

The District has not established a quantitative threshold of significance for construction-related TAC emissions. Therefore, the District recommends that lead agencies address this issue on a case-by-case basis, taking into consideration the specific construction-related characteristics of each project and its proximity to off-site receptors.

The impact discussion shall disclose the following about the construction activity associated with each project.

- Types of off-site receptors and their proximity to construction activity;
- Duration of construction period;
- Quantity and types of diesel-powered equipment;

- Number of hours equipment would be operated each day;
- Location of equipment staging area;
- Predominant wind direction; and
- Amount of on-site diesel-generated PM exhaust if mass emission levels from construction activity are estimated.

The District recognizes that detailed information about a project's construction activities may not be known at the time of writing the impact analysis. In this case, the District recommends the use of conservative estimates for the parameters including the number and type of construction equipment used, the hours of operation, and the distance from equipment to the nearest off-site receptors.

Demolition or Renovation of Regulated Asbestos Containing Materials

Demolition or renovation of existing buildings and structures would be subject to District Rule 902 (Asbestos). District Rule 902 is intended to limit asbestos emissions from demolition or renovation of structures and the associated disturbance of regulated asbestos containing material (RACM) generated or handled during these activities. The rule addresses the national emissions standards for asbestos along with some additional requirements. The rule requires lead agencies, building owners, and their contractors to notify the District of any regulated renovation or demolition activity. This notification includes specific requirements for surveying, removal, location, work methods, and disposal of RACM. Projects that comply with Rule 902 would ensure that RACM would be disposed of appropriately and safely, minimizing the release of airborne asbestos emissions. Therefore, demolition activity would not result in a significant impact to air quality.

Because District Rule 902 is in place, no further analysis about the demolition of RACM is needed in a CEQA document. However, the District does recommend that CEQA documents acknowledge and discuss District Rule 902 to support the public's understanding of this issue.

Naturally Occurring Asbestos

Naturally occurring asbestos (NOA) was identified as a TAC in 1986 by ARB. NOA is located in many parts of California and is commonly associated with ultramafic rocks, according the California Department of Geology's special publication titled *Guidelines for Geologic Investigations of Naturally Occurring Asbestos in California*. Asbestos is the common name for a group of naturally occurring fibrous silicate minerals that can separate into thin but strong and durable fibers. Ultramafic rocks form in high-temperature environments well below the surface of the earth. By the time they are exposed at the surface by geologic uplift and erosion, ultramafic rocks may be partially to completely altered into a type of

metamorphic rock called serpentinite. Sometimes the metamorphic conditions are right for the formation of chrysotile asbestos or tremolite-actinolite asbestos in the bodies of these rocks or along their boundaries, according to a report published in 2000 by the California Geological Survey (formerly the California Division of Mines and Geology) titled ***A General Location Guide for Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos.***

For individuals living in areas of NOA, there are many potential pathways for airborne exposure. Exposures to soil dust containing asbestos can occur under a variety of scenarios, including children playing in the dirt, dust raised from unpaved roads and driveways covered with crushed serpentine, grading and earth disturbance associated with construction activity, quarrying, gardening, and other human activities. For homes built on asbestos outcroppings, asbestos can be tracked into the home and can also enter as fibers suspended in the air. Once such fibers are indoors, they can be entrained into the air by normal household activities, such as vacuuming (as many respirable fibers will simply pass through vacuum cleaner bags).

People exposed to low levels of asbestos may be at elevated risk (e.g., above background rates) of lung cancer and mesothelioma. The risk is proportional to the cumulative inhaled dose (quantity of fibers), and also increases with time since first exposure. Although there are a number of factors that influence the disease-causing potency of any given asbestos (such as fiber length and width, fiber type, and fiber chemistry), all forms are carcinogens.

At the request of SMAQMD, the California Geological Survey (formerly the California Division of Mines and Geology) prepared a report called the ***Relative Likelihood for the Presence of Naturally Occurring Asbestos in Eastern Sacramento County, California.*** The map in this report displays "areas moderately likely to contain NOA." Although geologic conditions are more likely for asbestos formation in particular areas identified by the map, the presence thereof is not certain.

Using the detailed map at the end of this report, a lead agency shall discuss whether a proposed project would be located in "areas moderately likely to contain NOA." If a project would not involve earth-disturbing construction activity in one of these areas or would not locate receptors in one of these areas then it can be assumed that the project would not have the potential to expose people to airborne asbestos particles. If a project would be located in an area moderately likely to contain NOA, then the impact shall be considered potentially significant.

5.3.2 Siting New Operational TAC Sources

Siting Permitted TAC Sources

The siting of new stationary sources of TACs is subject to the rules under District Regulation 2, Permits. Each new stationary source is evaluated to determine whether it has the potential to emit TACs. The District assesses the impact from TACs based on its guidance document, ***Supplemental Risk Assessment Guidelines***

for New and Modified Sources, as well as guidance documents from the Office of Environmental Health Hazard Assessment (OEHHA), ARB and the California Air Pollution Control Officers Association. The District requires emission controls, similar to Best Available Control Technology (BACT), called Toxic Best Available Control Technology (T-BACT) for certain sources.

In addition to T-BACT requirements, permits for equipment that may emit TACs may also contain conditions required by the National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Air Toxic Control Measures (ATCMs) promulgated by the EPA and ARB, respectively. In short, a new stationary source of TACs would not receive the authority to construct or permit to operate if it would result in:

- A cancer risk greater than 10.0 in one million at any off-site receptor; and/or
- An off-site ground-level concentration of non-carcinogenic TACs generated from the project that would result in a Hazard Index greater than 1.0 (unless approved by OEHHA).

These permitting requirements are identical to the District's thresholds of significance for TACs generated by stationary sources. Therefore, lead agencies can determine that a new stationary source of TACs that attains the authority to construct and permit to operate from the District would not exceed the District's applicable TAC thresholds of significance.

SITING LAND USES THAT INCLUDE NON-PERMITTED TAC SOURCES

Some land use development projects, such as a truck distribution center or a commercial venue, could result in a high volume of TAC-generating activity in a relatively small or defined area. For instance, a discount superstore may receive approximately 5 deliveries each day from semi-tractor trailers at its loading dock. The potential impact of TAC emissions from a project of this type and size could be assessed qualitatively based on the level of truck activity, the proximity to nearby off-site receptors, and the predominant wind direction. However, a truck distribution center that has multiple loading docks, generates a high number of trips by diesel trucks, and/or includes diesel-powered "yard trucks" that only operate on the site would likely require a full HRA to disclose the potential health impacts. These types of HRAs should be performed according to the guidance provided by the California Air Pollution Control Officers Association.

5.3.3 SITING NEW SENSITIVE RECEPTORS

The California Supreme Court decision in the case of ***California Building Industry Association v. Bay Area Air Quality Management District (2015) 62 Cal. 4th 369*** clarified that lead agencies are not required by CEQA to analyze the impact of the existing environmental conditions on a project's future users or residents unless

the project will exacerbate the existing environmental hazards or conditions.[5] This limits the CEQA analysis of existing TAC source impacts on a proposed project's new receptors. It is important to note that CEQA does require analysis of existing environmental conditions in specific situations, such as airports and schools. Consult the State CEQA Statutes and Guidelines for more information.

While not a CEQA impact, the District maintains that siting new receptors where they will be exposed to an existing TAC source is an important public health issue and recommends that these situations be analyzed, health risks disclosed, and measures implemented to reduce risks through the lead agency's planning process.

For projects that would site receptors in close proximity to existing permitting and non-permitted sources of TACs, the District is in the process of developing guidance to assist lead agencies outside of CEQA review.

For projects that would site receptors in close proximity to major roadways, lead agencies shall use the District's ***Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways (Protocol)***. The Protocol includes guidance for TAC analysis, disclosure and exposure reduction best practices.

5.4 MITIGATION

Mitigation strategies for reducing diesel PM exhaust emitted by off-road construction equipment, on-road engines, and measures for controlling NOA during construction are discussed separately below.

Measures that reduce health risk exposure from TACs generated by new permitted stationary sources are determined through the District's permitting process in compliance with federal, state and District regulations. Measures to reduce health risk exposure from TACs generated by new non-permitted sources will be determined on a project by project basis by the lead agency in consultation with the District.

5.4.1 DIESEL PM EXHAUST FROM CONSTRUCTION EQUIPMENT

Implementation of the District's Basic Construction Emission Control Practices would result in the reduction of diesel PM exhaust emissions in addition to CAP emissions, particularly the measures to minimize engine idling time and maintain construction equipment in proper working condition and according to manufacturer's specifications. This is also true for the Enhanced Exhaust Control Practices for off-road construction equipment, which reduce particulate exhaust emissions by 45% and regulate the opacity of exhaust from all off-road diesel powered equipment. The District's basic and enhanced mitigation measures are discussed in further detail in Chapter 3, Construction-Generated Criteria Air Pollutant and Precursor Emissions.

[5] *California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal. 4th 369

In addition, the District provides the following non-comprehensive list of measures to reduce exposure of sensitive receptors to diesel PM exhaust emissions associated with construction activity.

- Install diesel particulate filters or implement other ARB-verified diesel emission control strategies on construction equipment to further reduce diesel PM emissions beyond the 45% reduction required by the District's Enhanced Exhaust Control Practices;
- Use equipment during times when receptors are not present (e.g., when school is not in session or during non-school hours; or when office buildings are unoccupied);
- Establish staging areas for the construction equipment that are as distant as possible from off-site receptors;
- Establish an electricity supply to the construction site and use electric powered equipment instead of diesel-powered equipment or generators, where feasible;
- Use haul trucks with on-road engines instead of off-road engines even for on-site hauling;
- Equip nearby buildings with appropriate filtration systems at all mechanical air intake points to the building to reduce the levels of diesel PM that enter the buildings; and/or
- Temporarily relocate receptors during construction activity.

Lead agencies shall consider the applicability and feasibility of each measure on a project by project basis. The District also encourages lead agencies to develop additional measures.

5.4.2 Diesel PM Exhaust from On-Road Equipment

In some instances diesel PM can be controlled at the source by implementing emission control technologies. ARB's Diesel Certification Program maintains a list of ARB-verified diesel emission control strategies for reducing diesel PM from on-road and off-road engines (e.g., diesel particulate filters). Lead agencies may implement mitigation that requires the use of these strategies. For example, a lead agency may require that ARB-verified diesel emission control strategies be implemented by the operator of a proposed truck yard that would be located near existing or future planned receptors.

5.4.3 Control Measures for Naturally Occurring Asbestos

The District recommends the following mitigation measure for projects that would be located in "areas moderately likely to contain NOA" identified by the California Geological Survey's report, titled ***Relative Likelihood for the Presence of Naturally Occurring Asbestos in Eastern Sacramento County, California***.

- A site investigation shall be performed to determine whether and where NOA is present in the soil and rock on the project site and/or areas that would be disturbed by the project. The site investigation shall include the collection of soil and rock samples (3 per acre) by a California Registered geologist. If the site investigation determines that NOA is not present on the project site then the project applicant shall submit a Geologic Exemption as allowed under Title 17, Section 93105, Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining (Asbestos ATCM). If the site investigation determines that NOA is present on the project site, then the project applicant shall submit an Asbestos Dust Mitigation Plan including but not limited to control measures required by the Asbestos ATCM for approval by the District. The project applicant shall submit the plan to the District for review and approval before beginning any ground disturbance activity. District approval of the plan must be received before ground disturbance occurs in any "areas moderately likely to contain NOA," as determined by the map in California Geological Survey's report titled *Relative Likelihood for the Presence of Naturally Occurring Asbestos in Eastern Sacramento County, California*. Upon approval of the Asbestos Dust Mitigation Plan by the District, the applicant shall ensure that construction contractors implement the terms of the plan throughout the construction period. This measure shall be fully funded by the project applicant.

Implementation of the above mitigation measure would reduce impacts associated with generation of fugitive dust that potentially contains NOA. If the site investigation determines that NOA is present on the project site, then implementation of a District-approved dust mitigation plan would reduce impacts related to construction in serpentinite soils. Implementation of these measures would reduce the potentially significant impact associated with exposure to NOA during construction to a less-than-significant level.

If NOA is located on the surface of the project site then mitigation may be necessary to reduce the risk of generating airborne asbestos from some operational activities such as recreational activities on baseball diamonds and dirt running tracks or residents overturning soil for gardening purposes. In order to reduce exposure to airborne asbestos emissions in these types of situations, lead agencies shall consider mitigation that requires all surface soil containing NOA to be replaced with clean soil or capping these surfaces with another material (e.g., cinder or rubber).

EXHIBIT 9

8.2. GREENHOUSE GASES

The District does not have an adopted *Threshold of Significance* for construction-related GHG emissions. However, the Lead Agency should quantify and disclose GHG emissions that would occur during construction, and make a determination on the significance of these construction-generated GHG emission impacts in relation to meeting AB 32 GHG reduction goals. BAAQMD recommends using URBEMIS for proposed land use development projects and RoadMod for proposed projects that are linear in nature. Sources of construction-related GHGs only include exhaust, for which the same detailed guidance as described for criteria air pollutants and precursors should be followed.

The Lead Agency is encouraged to incorporate best management practices to reduce GHG emissions during construction, as applicable. Best management practices may include, but are not limited to: using alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet; using local building materials of at least 10 percent; and recycling or reusing at least 50 percent of construction waste or demolition materials.

8.3. TOXIC AIR CONTAMINANTS

BAAQMD recommends that the same community risk and hazard *Threshold of Significance* for project operations be applied to construction. However, BAAQMD suggests associated impacts should be addressed on a case-by-case basis, taking into consideration the specific construction-related characteristics of each project and proximity to off-site receptors, as applicable. The Air District recommends that for construction projects that are less than one year duration, Lead Agencies should annualize impacts over the scope of actual days that peak impacts are to occur, rather than the full year.

BAAQMD has developed guidance for estimating risk and hazards impacts entitled *Recommended Methods for Screening and Modeling Local Risks and Hazards* (May 2010) which also includes recommendations for mitigation of significant risk and hazards impacts. The Air District has also developed a Construction Risk Calculator model that provides distances from a construction site, based on user-provided project date, where the risk impacts are estimated to be less than significant; sensitive receptors located within these distances would be considered to have potentially significant risk and hazards impacts from construction. The Construction Risk Calculator can be downloaded from the Air District web site at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES.aspx.

8.3.1. Diesel Particulate Matter

Construction-related activities could result in the generation of TACs, specifically diesel PM, from on-road haul trucks and off-road equipment exhaust emissions. Due to the variable nature of construction activity, the generation of TAC emissions in most cases would be temporary, especially considering the short amount of time such equipment is typically within an influential distance that would result in the exposure of sensitive receptors to substantial concentrations. Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet (ARB 2005). In addition, current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities. This results in difficulties with producing accurate estimates of health risk. Additionally, the implementation of the *Basic Construction Mitigation Measures* (table 8-2), which is recommended for all proposed projects, would also reduce diesel PM exhaust emissions.

However, these variability issues associated with construction do not necessarily minimize the significance of possible impacts.

The analysis shall disclose the following about construction-related activities:

1. Types of off-site receptors and their proximity to construction activity within approximately 1,000 feet;
2. Duration of construction period;
3. Quantity and types of diesel-powered equipment;
4. Number of hours equipment would be operated each day;
5. Location(s) of equipment use, distance to nearest off-site sensitive receptors, and orientation with respect to the predominant wind direction;
6. Location of equipment staging area; and
7. Amount of on-site diesel-generated $PM_{2.5}$ exhaust (assuming that all on-site diesel $PM_{2.5}$ exhaust is diesel PM) if mass emission levels from construction activity are estimated.

In cases where construction-generated emissions of diesel PM are anticipated to occur in close proximity to sensitive receptors for extended periods of time, lead agencies are encouraged to consult with BAAQMD.

8.3.2. Demolition and Renovation of Asbestos-Containing Materials

Demolition of existing buildings and structures would be subject to BAAQMD Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing). BAAQMD Regulation 11, Rule 2 is intended to limit asbestos emissions from demolition or renovation of structures and the associated disturbance of asbestos-containing waste material generated or handled during these activities. The rule addresses the national emissions standards for asbestos along with some additional requirements. The rule requires the Lead Agency and its contractors to notify BAAQMD of any regulated renovation or demolition activity. This notification includes a description of structures and methods utilized to determine whether asbestos-containing materials are potentially present. All asbestos-containing material found on the site must be removed prior to demolition or renovation activity in accordance with BAAQMD Regulation 11, Rule 2, including specific requirements for surveying, notification, removal, and disposal of material containing asbestos. Therefore, projects that comply with Regulation 11, Rule 2 would ensure that asbestos-containing materials would be disposed of appropriately and safely. By complying with BAAQMD Regulation 11, Rule 2, thereby minimizing the release of airborne asbestos emissions, demolition activity would not result in a significant impact to air quality.

Because BAAQMD Regulation 11, Rule 2 is in place, no further analysis about the demolition of asbestos-containing materials is needed in a CEQA document. BAAQMD does recommend that CEQA documents acknowledge and discuss BAAQMD Regulation 11, Rule 2 to support the public's understanding of this issue.

8.3.3. Naturally Occurring Asbestos

Naturally occurring asbestos (NOA) was identified as a TAC in 1986 by ARB. NOA is located in many parts of California and is commonly associated with ultramafic rocks, according to the California Department of Geology's special publication titled Guidelines for Geologic Investigations of Naturally Occurring Asbestos in California. Asbestos is the common name for a group of naturally occurring fibrous silicate minerals that can separate into thin but strong and durable fibers. Ultramafic rocks form in high-temperature environments well below the surface of the earth. By the time they are exposed at the surface by geologic uplift and erosion, ultramafic rocks may be partially to completely altered into a type of metamorphic rock called serpentinite.

EXHIBIT 10

California Department of Fish and Wildlife
Biogeographic Data Branch
California Natural Diversity Database

License Agreement for the California Natural Diversity Database

June 2018

The following terms and conditions govern the use of data from the Department of Fish and Wildlife's (DFW) California Natural Diversity Database (CNDDB). By using the CNDDB applications, associated CNDDB Geographic Information Systems (GIS) data, and/or the Spotted Owl Database, the user agrees to the following:

1. The CNDDB and Spotted Owl Database are proprietary databases owned by the California Department of Fish and Wildlife.
   a) The user may not resell, redistribute, or repackage CNDDB or Spotted Owl data, except as allowed by this agreement.
   b) The user may make copies of the CNDDB and Spotted Owl data in digital or hardcopy form for use or distribution within the local office of the user's department, agency, business, or corporation. This copy privilege does not extend to professional organizations, associations, or affiliations.[1]
   c) Subcontractors may have access to these data during the course of any given project, but they must not be given a copy, or access, for use on subsequent, unrelated work.[2]
   d) The CNDDB and Spotted Owl data may be shared freely between current subscribers, but should not be released to the public or non-subscribers.
2. The CNDDB is dynamic. DFW adds, modifies, and updates records daily, and the CNDDB data in our web applications are updated on a regular basis. It is the user's responsibility to update their copy of the CNDDB GIS data from the CNDDB webpage. Check the Updates page and log in to download the current version.
3. When creating maps for public viewing, please refer to our Data Use Guidelines document to answer questions regarding the appropriate ways to depict CNDDB data in user products. Correct interpretation of the CNDDB GIS data relies on utilizing the biological attribute data embedded in the GIS polygon features. For information on interpreting the data within the Spotted Owl Database, please refer to the Spotted Owl Information page.
4. When creating static or interactive maps or products for public viewing in print or over the internet, care must be taken not to violate our "no redistribution or repackage" clause (see 1.a. above). The information within these databases may not be displayed over the internet except with DFW's express permission. DFW understands there are situations where an organization may need to display CNDDB and Spotted Owl data on its website for business purposes. In those cases, the user must contact the CNDDB program for guidance and written permission on how to properly display CNDDB data on the website. As a general rule, data from the CNDDB and Spotted Owl Database may only be displayed at such a scale (no larger than a scale of 1:350,000), or in such a way that the viewers/users cannot determine exact location information of the elements mapped in the system. The CNDDB

[1] Such groups may not purchase one subscription for distribution to all members of the group.
[2] Consulting firms that subcontract work on portions of a project to another contractor that is not a subscriber may share the CNDDB data for that project. However, the subcontractor must relinquish access to the data when that work is completed. Counties that subscribe to the CNDDB may not share their subscription copy of RareFind with all consultants that develop EIRs for their Planning Office; those consultants must subscribe individually to the CNDDB.

and Spotted Owl data include location information for the state's most imperiled species, and these are sensitive resources.

5. Data within the CNDDB and Spotted Owl Database require biological expertise for proper analysis, interpretation, and application. It is the user's responsibility to ensure that the data obtained from DFW are used correctly. DFW staff are available by phone to advise users in the technical aspects of the data. In addition, DFW has tutorials and videos online to help interpret the CNDDB and Spotted Owl data. DFW periodically offers CNDDB training. Visit the CNDDB's training page for information on these resources.
6. DFW does not portray its databases as an exhaustive or comprehensive inventory of all rare species and natural communities statewide. For any given location in California, a lack of species occurrences or records in no way indicates or implies that the species do not occur there. Field observations by qualified persons and using the proper protocols at appropriate times are necessary to support negative findings. Much of the state has never been surveyed for plant and animal species.
7. The user's contribution of data to the CNDDB and Spotted Owl Database is important and encouraged. DFW accepts data in many formats. For the CNDDB, please visit our reference webpage Submitting Data to the CNDDB for guidance on data submissions. For Spotted Owl data submissions, please contact the Spotted Owl Data Manager (OwlObs@wildlife.ca.gov).
8. Citations to the CNDDB and/or Spotted Owl Database shall be made in the user's reports, papers, publications, internet products, and maps that incorporate CNDDB or Spotted Owl data.[3]

---

[3] Citations should include the version of the database used (government or commercial, month and year), as well as the platform (e.g. Rarefind, BIOS, CDFW Data Portal) and date accessed. Version information can be found in the Metadata for GIS datasets, or in the margins of reports (lower left corner of CNDDB RareFind reports, upper left corner of Spotted Owl reports).

Examples:
California Department of Fish and Wildlife. (2018). California Natural Diversity Database (CNDDB) – Government version dated June 1, 2018. Retrieved June 08, 2018 from https://map.dfg.ca.gov/rarefind/view/RareFind.aspx.

California Department of Fish and Wildlife. (2018). Spotted Owl Observations [ds704] – version updated May 31, 2018. Retrieved June 8, 2018, from http://bios.dfg.ca.gov.

EXHIBIT 11

2016 Traffic Volumes on California State Highways

2016 TRAFFIC VOLUMES

ON THE CALIFORNIA STATE HIGHWAY SYSTEM

STATE OF CALIFORNIA

THE TRANSPORTATION AGENCY

DEPARTMENT OF TRANSPORTATION

DIVISION OF TRAFFIC OPERATIONS

Sacramento, CA 95814

916-654-4578

Prepared in Cooperation with the

U.S. DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

To Purchase This Book
Price $15.00
Phone: 916-263-0822

2016 Traffic Volumes on California State Highways

Dist	Route	County		Postmile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
03	020	COL		31.47	COLUSA, FIFTH STREET	1450	12700	12100	1450	12700	12100
03	020	COL		31.841	COLUSA, MARKET/BRIDGE STREETS	1700	15500	15000	1700	15500	15000
03	020	COL		32.29	COLUSA, FREMONT STREET	1450	13500	12900	1000	11700	11200
03	020	COL		33.12	MOON BEND ROAD	780	8400	8000	780	8400	8000
03	020	COL		36.785	JCT. RTE. 45 SOUTH	780	8400	8000	700	7900	7400
03	020	COL	R	39.34	COLUSA/SUTTER COUNTY LINE	760	8600	8000			
03	020	SUT	R	0	COLUSA/SUTTER COUNTY LINE				760	8600	8000
03	020	SUT		5.009	EAST END SUTTER BYPASS	760	8500	8100	760	8500	8100
03	020	SUT		9.176	ACACIA AVENUE	760	8500	8100	950	10500	9700
03	020	SUT		12.67	TOWNSHIP ROAD	950	10500	9700	1100	11500	11000
03	020	SUT		13.6	GEORGE WASHINGTON BOULEVARD	1100	11500	11000	1450	17800	17200
03	020	SUT	R	15.35	CIVIC CENTER BOULEVARD	2650	30500	29500	3100	35500	34500
03	020	SUT	R	15.598	JCT. RTE. 99	3100	35500	34500	3500	39000	37500
03	020	SUT		16.33	YUBA CITY, LIVE OAK BOULEVARD	4450	48000	46500	4300	45500	43500
03	020	SUT		16.52	YUBA CITY, PLUMAS STREET	4300	45500	43500	4300	42500	38500
03	020	SUT		16.838	YUBA CITY, SUTTER STREET	4300	42500	38500	3650	42000	39400
03	020	SUT		17.057	SUTTER/YUBA COUNTY LINE	3650	42000	39400			
03	020	YUB		0	SUTTER/YUBA COUNTY LINE				3650	42000	39400
03	020	YUB		.675	MARYSVILLE, H STREET	3650	42000	36400	3600	37000	35000
03	020	YUB		.84	MARYSVILLE, F STREET	3400	34500	33000	3250	31000	30000
03	020	YUB		.989	MARYSVILLE, SOUTH JCT. RTE. 70	3250	31000	30000	2500	25000	22000
03	020	YUB		1.236	MARYSVILLE, 9TH/B STREETS	2500	25000	22000	2200	29000	25700
03	020	YUB		1.472	NORTH JCT. RTE. 70	2200	28500	25700	1450	18400	17100
03	020	YUB	R	1.98	MARYSVILLE, BUCHANAN STREET	1450	18200	16500	1350	16600	15000
03	020	YUB	R	2.94	MARYSVILLE, 22ND STREET	1550	16600	15000	1200	14000	12500
03	020	YUB	R	7.018	HALLWOOD BOULEVARD	1050	12100	11300	1050	12100	10700
03	020	YUB	R	7.89	LOMA RICA ROAD	1100	12300	10900	1000	9900	9000
03	020	YUB		13.269	MARYSVILLE ROAD	1000	9900	9000	800	8400	7600
03	020	YUB		21.295	HAMMONTON/SMARTVILLE RD	800	8400	7600	830	8800	8000
03	020	YUB		21.665	YUBA/NEVADA COUNTY LINE	830	8800	8000			
03	020	NEV		0	YUBA/NEVADA COUNTY LINE				830	8800	8000
03	020	NEV	R	4.651	PLEASANT VALLEY ROAD	830	8800	8000	1350	15400	14600
03	020	NEV	R	6.6	PENN VALLEY DRIVE	1350	15400	14600	1650	18200	17000
03	020	NEV	R	12.162	GRASS VALLEY, MILL STREET	1650	18200	17000	2550	27000	25600
03	020	NEV	R	12.24	GRASS VALLEY, JCT. RTE. 49	2550	27000	25600	4250	49500	48000
03	020	NEV	R	12.302	GRASS VALLEY, JCT. RTE. 49	4250	49500	48000	4250	49500	48000
03	020	NEV	R	12.864	GRASS VALLEY, NORTH AUBURN STREET	4250	49500	48000	3950	43000	38500

Page 42

2016 Traffic Volumes on California State Highways

Dist	Route	County	Postmile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
03	020	NEV R	13.112	GRASS VALLEY, BENNETT STREET	3950	43000	38500	5200	57000	48200
03	020	NEV R	13.614	GRASS VALLEY, IDAHO/MARYLAND ROAD	5200	57000	48200	4200	44000	41000
03	020	NEV R	14.266	DORSEY DRIVE OC	4200	44000	41000	3600	39000	36800
03	020	NEV R	14.797	BRUNSWICK ROAD	3600	39000	36800	3050	35500	32500
03	020	NEV R	15.41	BANNER RIDGE OC	3050	35500	32500	3050	35500	32500
03	020	NEV R	15.916	GOLD FLAT ROAD	3050	35500	32500	3000	29500	28700
03	020	NEV R	16.741	NEVADA CITY, SACRAMENTO STREET	3000	29500	28700	3000	27500	25200
03	020	NEV R	16.988	NEVADA CITY, BROAD STREET	3000	27500	25200	2550	18800	17100
03	020	NEV R	17.24	NEVADA CITY, COYOTE STREET	2550	18800	17100	2400	18200	16200
03	020	NEV R	17.398	NEVADA CITY, EAST JCT. RTE. 49	2400	18200	16200	920	6300	5400
03	020	NEV	23.25	SCOTTS FLAT ROAD	900	6200	5200	730	5700	4300
03	020	NEV	29.6	WHITE CLOUD CAMPGROUND	570	4750	3550	570	4750	3550
03	020	NEV	31.834	WASHINGTON ROAD	570	4750	3550	500	4350	3200
03	020	NEV	41.287	NEVADA/PLACER COUNTY LINE	500	4350	3200	500	4350	3200
03	020	PLA	43.868	PLACER/NEVADA COUNTY LINE	500	4350	3200	500	4350	3200
03	020	NEV	45.661	JCT RTE 80	500	4350	3200			
07	022	LA	0	LONG BEACH, JCT. RTE. 1				5400	65000	62000
07	022	LA	.084	LONG BEACH, BELLFLOWER BOULEVARD	5400	65000	62000	5500	67000	64000
07	022	LA	1.142	LONG BEACH, STUDEBAKER ROAD	6100	74000	70000	8700	105000	100000
07	022	LA	1.467	LOS ANGELES/ORANGE COUNTY LINE	8700	105000	100000			
12	022	ORA	0	LOS ANGELES/ORANGE COUNTY LINE				8700	105000	100000
12	022	ORA R	.66	JCT. RTE. 405	11200	148000	142500	15600	150000	142500
12	022	ORA R	2.653	WESTMINSTER, KNOTT AVE/GOLDEN WEST ST	16600	159000	150500	11600	156000	150500
12	022	ORA R	3.587	GARDEN GROVE, JCT. RTE. 39	12300	164000	158600	15900	190000	183400
12	022	ORA R	4.812	GARDEN GROVE, MAGNOLIA STREET	15900	190000	183400	15200	203000	196400
12	022	ORA R	5.817	GARDEN GROVE, BROOKHURST STREET	15200	203000	196400	15600	209000	202100
12	022	ORA R	6.811	GARDEN GROVE, EUCLID STREET	15600	209000	202100	15900	226000	216500
12	022	ORA R	7.829	GARDEN GROVE, HARBOR BOULEVARD	15900	226000	216500	15900	232000	223500
12	022	ORA R	8.822	GARDEN GROVE, GARDEN GROVE BOULEVARD	15900	232000	223500	16200	238000	229600
12	022	ORA R	9.729	ORANGE, MANCHESTER AVENUE/ CITY DRIVE	16300	239000	231000	17100	245000	235500
12	022	ORA R	10.478	SANTA ANA, JCT. RTES. 5 AND 57	17100	245000	235500	10900	152000	146700
12	022	ORA R	10.992	SANTA ANA, MAIN STREET	10900	152000	146700	10900	154000	146700
12	022	ORA R	11.825	ORANGE, GLASSELL STREET	10800	153000	145200	10500	157000	141800
12	022	ORA R	12.866	TUSTIN AVENUE	10500	157000	141800	8700	122000	118400
12	022	ORA R	13.164	JCT. RTE. 55	8700	122000	118400			
07	023	LA	0	JCT. RTE. 1				70	540	510
07	023	LA	4.791	SOUTH JUNCTION MULHOLLAND HIGHWAY	120	930	880	140	1100	1050

Page 43

INTENTIONALLY LEFT BLANK

Response to Comment Letter R

Soluri Meserve
Patrick Soluri
June 3, 2019

R-1 The comment provides introductory comments and states that the Draft EIR is inadequate in several areas, inconsistent with technical studies, and internally inconsistent. The comment states that the City must undertake additional analysis and mitigation of the project impacts, and recirculate the Draft EIR.

The comment does not identify any specific inaccuracies or inadequacies in the Draft EIR but lists several environmental topics in which the Draft EIR is asserted fail as an informational document. Specific concerns are identified and responded to below. No response to this comment is required.

R-2 The comment describes the purpose of an EIR and the conditions under which recirculation of a Draft EIR would be required. The comment states that the new information needed to respond to the comments presented in this letter will require recirculation of the Draft EIR.

The comment does not identify any specific inaccuracies or inadequacies in the Draft EIR. As shown in the following responses, the Draft EIR text revisions presented in Chapter 3 of this Final EIR do not constitute significant new information and it is not necessary to recirculate the Draft EIR. As discussed in Final EIR Chapter 1, Introduction, the text revisions include an adjustment to the project description under Alternative B as well as text added in support of the responses to comments received on the Draft EIR, such as additional description of existing conditions, updates to regulatory framework, clarification of project impacts, and refinements to mitigation measures. No new significant impacts or increases in the severity of previously-evaluated impacts have been identified, no new mitigation measures are recommended and the modifications to mitigation measures do not introduce requirements that are substantively different from those identified in the Draft EIR, and no changes have been made that result in the public having been deprived of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect.

R-3 The comment states that the mitigation measures in the Draft EIR are given without any explanation about their effectiveness, that CEQA requires more description of the mitigation measures and explanation that they will be effective, and that the EIR should explain the conclusions that no mitigation is necessary and/or available.

The comment does not address any specific mitigation measure. The analysis throughout the Draft EIR follows the general pattern: document existing conditions and relevant regulatory framework; identify the potential impact; describe the project's contribution to the impact; if the impact is potentially significant, identify potential mitigation and its relation to the impact; and identify the project's impact after mitigation. For each impact, the analysis describes the

mitigation measure and why it would be effective at reducing impacts. Specific comments are addressed in the following responses to comments.

R-4 The comment states that the Draft EIR neglects to evaluate the whole project and states that the project description lacks details, specifically regarding onsite mine waste, tailings, protected plant species, and the configuration and subsequent noise of commercial and mechanical facilities. The comment states that the lack of details in the project description precludes meaningful analysis of impacts. The comment also summarizes case law and CEQA requirements.

Section 15124 of the CEQA Guidelines requires that the project description "contain specific information but should not supply extensive detail beyond that needed for evaluation and review of the environmental impact." The Project Description is presented in Chapter 2 of the Draft EIR. It includes a brief summary of the existing conditions at the project site in Section 2.1 Study Area Characteristics. This includes identifying the types of vegetation communities present at the site and the fact that "the site contains arsenic, lead, and mercury associated with mining activity." Additionally, each of the environmental impact analysis chapters (chapters 3 through 15) provide further description of the existing conditions.

The comment is correct that the location and configuration of commercial and mechanical equipment has not yet been identified and additional analysis will be needed at the time this information is known. This is typical of commercial development projects during the environmental review process. As discussed in Response to Comment J-5, the proposed building footprints and elevations are known, and this information was used to characterize the potential for such equipment to create unacceptable noise levels at the residential uses. Mitigation Measure 9b commits the project applicant to completing the necessary additional study and implementing additional measures if needed to avoid impacts, defines the requirements for the study, and identifies the performance standard that the project must meet. Thus the mitigation complies with the requirements defined by CEQA Guidelines Section 15126.4(B).

R-5 The comment states that the Draft EIR fails to provide necessary information regarding the proposed fair share traffic mitigation, is inconsistent with the traffic study, and fails to mitigate impacts. The comment notes that the traffic analysis finds a significant impact at intersection 12 and 16 and states that the EIR violates CEQA by not setting forth all feasible mitigation measures to mitigate this project level impact. The comment states that the EIR's reliance on a fair-share contribution is impermissible because Table 8-8 shows that the project is solely responsible for the significant project-level impact at those locations.

The comment does not identify what other feasible mitigation the Draft EIR should have included. The Draft EIR relies on the improvements outlined in the Circulation Element of the City's 2020 General Plan. These improvements are associated with long term development in the City and its associated traffic impacts, to which the proposed project would contribute but would not be wholly responsible. The improvements outlined in the Circulation Element would be financed through the City's Capital Improvement Program (CIP), to which the proposed

project would contribute traffic impact fees, earmarked for the specific proposed improvements. The CIP is a common tool used by municipalities to outline a comprehensive plan to use an annual budget. Projects in the Grass Valley CIP and their expected costs are identified in Exhibit 4 in Response to Comment K-9 (Grass Valley 2016). The project's fair share contribution would be collected by the City prior to issuance of building permits and the fee amount would be calculated based on the City's adopted traffic impact fee rates and the specific size and type of land use authorized under each building permit.

Specific to Intersection 12, the project would not create the unacceptable LOS condition here; rather it would increase delay at this location. Draft EIR Tables 8-8 and 8-9 show both existing and existing plus project conditions. Both tables show that this intersection currently operates at LOS F in the PM peak hour, with 122.1 seconds of delay. Thus the unacceptable LOS is part of the existing conditions and the project would not be fully responsible for creating this condition. The Draft EIR identifies that Alternative A would increase delay at this intersection by 62 seconds for the PM peak hour (see Table 8-8) and Alternative B would increase delay by 35.5 seconds (see Table 8-9). The City has identified replacement of the existing porkchop barrier at this location as the necessary improvement for the existing conditions and the CIP anticipates signalization of this intersection to address impacts under the cumulative condition, as shown in Exhibit 4 in Response to Comment K-9. Mitigation Measure 8a has been revised to require the project applicant to fully construct the barrier and contribute a fair share amount to the future signalization or closure of this intersection. The conditions of approval for the Loma Rica Ranch Phase 1 project (Grass Valley 2019) include a requirement to fully construct the porkchop barrier, thus the improvement would be constructed by whichever project reaches the building permit threshold identified in the project's mitigation measure. Because signalization or closure of this intersection is included in the CIP, there is an established program for the improvement that will be funded through the City's development traffic impact fee. As shown in the TIAR, with signalization this intersection would operate at LOS C under Alternative A and LOS B under Alternative B. Thus, as revised, Mitigation Measure 8a ensures that the project's impacts under both the existing plus project and cumulative plus project conditions are reduced to a less-than-significant level and that the mitigation is roughly proportional to the project's contribution to the impacts.

As shown in Draft EIR Table 8-8, intersection 16, the intersection of Idaho Maryland Road and the SR 20/49 NB ramps, currently operates at LOS B in the AM Peak hour and D in the PM Peak hour and Alternative A would add 9.5 seconds of delay and degrade the LOS to F in the PM Peak hour. Table 8-9 shows that under existing plus Alternative B conditions the intersection would continue to operate acceptably at LOS D. In the cumulative scenario, the intersection is projected to operate at LOS C in the AM Peak hour and E in the PM Peak hour. With the addition of either Alternative A or Alternative B the intersection would continue to operate at an acceptable LOS in the AM Peak hour and would degrade to LOS F in the PM Peak hour. The improvement identified for this intersection is to install a traffic signal or convert the intersection to a roundabout. This improvement is included in the Western Nevada County Regional Transportation Mitigation Fee (Nevada County Transportation Commission 2016), therefore there is an established program for the improvement that will be funded through the Regional Transportation Mitigation Fee and the requirement in Mitigation Measure 8b for the

Dorsey Marketplace project to contribute a fair share towards the improvement is an effective way to mitigate the project's contribution to the existing plus project and cumulative plus project impacts.

R-6 The comment states that a fair share contribution is only adequate if it is part of a reasonable plan to provide mitigation, which the Draft EIR fails to provide, and states that the EIR should identify the required improvement, an estimate of the cost of that improvement, and information about how much the project would pay towards the improvement. The comment states that the Draft EIR is inadequate because it doesn't provide information about the City's CIP, how the fees are tied to it, or the "porkchop" improvement required in Mitigation Measure 8a and doesn't include the cost or formula for the project's contribution.

Text has been added to Draft EIR Section 8.2 to describe the Grass Valley Transportation Impact Fee and the Western Nevada County Regional Transportation Mitigation Fee. Text has also been added to Impacts 8-2 and 8-9 regarding the costs for the CIP improvements to which the project must contribute. As discussed in Response to Comment R-5, Mitigation Measure 8a has been revised to require the project applicant to construct the porkchop barrier needed in the near-term and to require the project applicant to contribute a fair share towards costs of signalizing or closing this intersection, consistent with the Grass Valley CIP.

R-7 The comment states that the analysis in the Draft EIR does not match the technical study for intersection 12 (62 seconds compared to 35.5 seconds for the PM peak hour) and the identified mitigation varies between the two: the technical study identified the installation of a traffic signal or closing the intersection while the Draft EIR mitigation measure calls for installing a larger porkshop barrier. Further the comment states that the Draft EIR does not discuss the post mitigation conditions or effectiveness of the proposed mitigation.

It is important to note that the TIAR and Draft EIR have Alternative A and Alternative B reversed. Thus, Draft EIR Table 8-8 corresponds to TIAR Table 20. The Draft EIR correctly identifies that Alternative A would increase delay at this intersection by 62 seconds for the PM peak hour (see Draft EIR Table 8-8 and TIAR Table 20) and Alternative B would increase delay by 35.5 seconds (see Draft EIR Table 8-9 ad TIAR Table 7). The Draft EIR states that, although the City has installed signage and a concrete barrier to prohibit/discourage left-turns, drivers continue to make illegal movements that increase delays. The Draft EIR thus requires mitigation to replace existing concrete "porkchop" barrier with a larger barrier that would prevent these illegal left turns allowing right turns in from southbound Brunswick Road and right turns out from eastbound Idaho Maryland Road, and thus reduce the amount of delays. This barrier was analyzed as part of the recently-approved Loma Rica Ranch Phase 1 project, and "the traffic study prepared for the proposed road and intersection changes confirm the traffic level of service will meet City standards" (Grass Valley 2019). Thus the project's contribution to delays at this intersection under existing plus project conditions would be reduced to a less-than-significant level.

The comment is correct that the TIAR identifies the improvement of either signalizing or closing this intersection. As discussed in Response to Comment R-5, this future improvement is

included in the Grass Valley CIP. Mitigation Measure 8a has been revised to include the requirement for the project to contribute a fair share towards this improvement. If the intersection is signalized, the TIAR shows that it would operate at LOS C under Alternative A and LOS B under Alternative B, thus the cumulative impact at this location would be reduced to a less-than-significant level.

R-8 The comment states that there are inconsistencies between the project-level and cumulative condition descriptions and the cumulative condition is based on unreasonable trip distribution data. The comment questions the TIAR assumption that the intersection of Brunswick and Idaho Maryland would be improved to allow full access in the cumulative condition when the purpose of Mitigation Measure 8a is to restrict movements in that intersection. The comment notes that in making the assumption for the future condition at this location, the Draft EIR refers to the Loma Rica EIR, but the Draft EIR does not tier from the Loma Rica EIR or incorporate it by reference in accordance with CEQA.

Text in the Draft EIR has been revised to clarify that the porkchop barrier is identified as the mitigation for this intersection under existing plus project condition but in the cumulative condition the intersection is expected to be closed or signalized, consistent with the Grass Valley CIP, as discussed in Response to Comment R-6. Because this improvement is included in the Grass Valley CIP, it is not necessary for the Draft EIR to tier from or incorporate by reference the Loma Rica Ranch EIR.

R-9 The comment states that there is inconsistency regarding the mitigation for intersection 16; the Draft EIR (Mitigation Measure 8b) offers either a traffic signal or roundabout while the technical study only proposes a traffic signal. Additionally, the comment states that there is no information regarding the mitigation measure's effectiveness.

The comment is correct to say that the TIAR only suggested a traffic signal while the Draft EIR Mitigation Measure 8b required either a traffic signal or a roundabout. Both a traffic signal and a roundabout would serve the same purpose by reducing the length of delay in traveling through the intersection without resulting in spillback onto adjacent intersection. Preliminary plans for improving this intersection considered both options. However, it has been determined that due to environmental and right-of-way constraints, the roundabout option has been removed from consideration. As shown in Final EIR Chapter 3, the Draft EIR has been revised to reflect that the intersection requires signalization, consistent with the Regional Transportation Mitigation Fee.

R-10 The comment states that the Draft EIR does not address toxic air contaminants (TACs) or human health impacts for either operational or construction emissions. The comment states that TACs, including diesel particulate matter (DPM) and ultrafine particulate (UFP) emissions, and associated health effects to future occupancies of the project site should have been addressed due to the project's proximity to SR 20/49. The comment states that the Draft EIR acknowledges that the project will exacerbate TAC emissions by generating new vehicle trips and this exacerbation requires that the Draft EIR evaluate the potential impacts of the hazardous emissions on futures residents or users.

The comment is correct that vehicle traffic is a source of TACs, including DPM and UFP. However, the traffic volumes on SR 20/49 do not warrant preparation of a health risk assessment. The project site is located adjacent to the SR 20/49 Dorsey Drive off-ramp. The southwestern corner of the project site is the closest point to the highway travel lanes, at a distance of approximately 85 feet. The proposed residences under Alternative A would be located over 800 feet from the highway travel lanes, while under Alternative B, the nearest residences would be approximately 170 feet from the travel lanes.

The California Air Resources Board (CARB) Land Use and Transportation Handbook recommends that new sensitive receptors should be located at least 500 feet from a major transportation facility, which is defined as a roadway carrying at least 100,000 vehicles per day (CARB 2005). As shown in Draft EIR Table 9-5, SR 20/49 in the project area carries approximately 29,350 vehicles per day currently. As the traffic volumes are approximately 40% below the threshold of 50,000 vehicles per day, people within the project site are not expected to be exposed to substantial concentrations of TACs associated with SR 20/49. There are no other substantial sources of TACs in the vicinity. Therefore, it is not necessary for the Draft EIR to include a health risk assessment for project site residents' exposure to TACs.

Additionally, CARB's Technical Advisory: Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways reports on research that has been completed on several strategies to reduce adverse health effects for people that reside near roads. It notes that vertical dispersion of pollutants, such as occurs when a solid wall is placed between the roadway and residents has been shown to reduce the concentration of TACs. Mitigation Measure 9a requires that a noise attenuation barrier be constructed between the off-ramp and the proposed residential apartment buildings in the southwestern corner of the site. This wall would help reduce TAC exposure at the project site. Similarly, the Technical Advisory found that landscaping placed between the roadway and residents has been shown to reduce exposure to TACs (CARB 2017a). Mitigation Measure 5a establishes detailed requirements for landscaping along the project site's western boundary. This would also help to minimize TAC exposure within the project site.

Further, in a fact sheet that accompanies the technical advisory, CARB summarizes several key research findings, including that near-roadway pollution has well-documented health impacts and sensitive uses should be placed 500 feet or more from roads that carry 50,000 vehicles per day; infill development leads to public health, climate, financial, and other benefits; and "California has many policies and plans to reduce car and truck pollution statewide which are already improving air quality, but will take time before the benefits are achieved" (CARB 2017b).

R-11 The comment describes UFPs and their sources as well as introduces the attached exhibits to the comment letter. The comment states that the Draft EIR does not mention UFPs as a potential air quality impact and that the Draft EIR will need to be recirculated to either correlate emission levels to identified health risks or explain why this analysis is not possible. The comment states that the EIR violates CEQA because it does not inform the public about the bare numbers with respect to mobile TACs or UFP emissions or the associated health effects.

The potential for residents of the project site to be exposed to TACs is discussed in Chapter 10, Air Quality. As noted previously, the total traffic volumes on SR 20/49 do not warrant preparation of a health risk assessment. Further, the comment recognizes that diesel engines are responsible for the majority of UFP associated with mobile emissions. SR 20/49 carries a very low volume of truck traffic. The total daily traffic volumes in 2016 were 29,350 trips. In 2013 (most recent available data at the time of preparation of this Final EIR) the total daily traffic volume 31,000 trips, of which 1,163 (less than 4%) were truck trips (Caltrans 2013). The information provided in the comment letter exhibits does not contradict the recommendations presented in the CARB Land Use and Transportation Handbook. For example, Exhibit 1, which discusses UFPs describes a study that focused on "two heavily traveled north-south freeways, Interstate 5 and California Highway 99." Similarly, Exhibit 2 focuses on the southern California Central Valley. Interstate 5 through the central valley carries daily traffic volumes that in 2013 reached over 110,000 trips in several segments, and were generally above 50,000 in most locations. For the segments of Interstate 5 in San Joaquin County from Stockton to the south, truck trips make up approximately 25% of the daily traffic volumes, while north of Stockton to the northern end of Sacramento County, truck trips make up between 8% and 20% of the daily traffic volumes (Caltrans 2013). Exhibit 1 also discusses specific health concerns for students at Arden Middle School, noting that the school is downwind of roads that carry 65,000 vehicles per day, with 1.5% of those being heavy-trucks on Watt Avenue, and the school is downwind of a traffic signal where braking and acceleration (which generate plumes of UFP emissions) is frequent. Thus the analysis presented in Exhibits 1 and 2 reflect scenario that are meaningfully different from the Dorsey Marketplace project site.

Additionally, the distance between the proposed residences and the travel lane of the highway would ensure UFP concentrations near the residences would be substantially less than along the highway. The International Journal of Environmental Research and Public Health found that studies show transportation-related UFP "are found in higher concentrations near major roadways but concentrations quickly drop off to near background concentrations" (CARB 2017a).

R-12 The comment states that the revised Draft EIR will need to include a full analysis of the potential TACs effects for future project occupants. The comment states that the City cannot rely on the absence of a significant threshold or other CEQA guidance from the Northern Sierra Air Quality Management District (NSAQMD) to avoid analyzing mobile source TAC emissions and health impacts. The comment states that while the NSAQMD 2009 CEQA guidelines don't include impacts to residential receptors near roadways, a health risk assessment was prepared for a project in Pleasanton by Dudek. The comment states that there is a fair argument that the future occupants would have a potentially significant air quality and associated health impacts from mobile TACs and UFP emissions. The comment also addresses construction-related TAC emissions, stating that the Draft EIR treats this potential impact in a cursory and impermissible manner. The comment states that construction will generate TAC emissions that could adversely affect existing residents in the area, states that the EIR analysis of these emissions is unsubstantiated, and that short-term construction emissions can still have potentially chronic and short-term effects. The comment references guidance from the

Sacramento Metropolitan Air Quality Management District (SMAQMD) and the Bay Area Air Quality Management District regarding the need for construction health risk assessments and the minimum information necessary to complete such an analysis.

The City of Pleasanton is within a different air district than Grass Valley and there are important differences in the Dorsey Marketplace project setting compared to the setting of the Pleasanton project. The Pleasanton project is adjacent to Interstate 80, which carries a much higher volume of traffic than SR 20/49, and it is located along a curve in the freeway that experiences regular slowdowns, creating increased emissions and pollutant concentrations due to the presence of idling vehicles. As explained in Responses to Comments R-10 and R-11, the traffic volumes on SR 20/49 do not warrant preparation of a health risk assessment in accordance with the CARB Land Use and Transportation Handbook. Given the CARB substantial evidence in the CARB handbook regarding the scenarios where a health risk assessment is warranted, there is not a fair argument that future occupants of the Dorsey Marketplace project site would have potentially significant air quality and health impacts from mobile TACs and UFP emissions.

Regarding construction period TAC emissions, the Draft EIR relies upon the air pollution emissions estimates developed using the CalEEMod modeling program, which is the industry-standard tool for completing air quality analyses under CEQA, as recognized by the guidance from several air districts. Text has been added to Impact 10-4, as shown in Chapter 3, Draft EIR Text Revisions, to restate the conclusions of the construction emissions modeling, which found that particulate matter emissions would reach a maximum of 10.8 pounds per day of PM_{10} and 6.7 pounds per day of $PM_{2.5}$; these levels are well-below the NSAQMD Level A threshold of 79 pounds per day. The construction thresholds established by the SMAQMD are 80 pounds per day of PM_{10} and 82 pounds per day of $PM_{2.5}$ when best available control technology is employed to minimize emissions and emission concentrations (SMAQMD 2015). Mitigation Measure 10a requires the project to implement such measures, consistent with the recommendations of the NSAQMD. Additional requirements have been added to Mitigation Measure 10a to ensure consistency with the applicable construction emission control practices recommended by the SMAQMD, as updated in July 2019 (SMAQMD 2019). Because the particulate matter emissions would remain below the established thresholds and Mitigation Measure 10a would ensure that construction emissions are subject to industry-standard control measures, it is not necessary to complete a construction health risk assessment.

R-13 The comment raises concerns regarding naturally occurring asbestos (NOA) and points out that the Draft EIR is inconsistent on its potential presence. The comment provides general information regarding serpentine rock and NOA. The comment states that the potential for NOA has been known to occur onsite since 2008 and tests should have been performed to determine whether NOA is present, thus the lack of tests constitutes deferred analysis. The comment then states that this is especially true as construction would generate both DPM and NOA emissions for nearby receptors.

The comment is correct that the referenced text on Draft EIR page 10-28 is in error. This text has been revised as shown in Chapter 3, Draft EIR Text Revisions. The presence of NOA has

been confirmed as reflected in the Remediation Action Workplan (RAW, Draft EIR Appendix J-3A) that was prepared for the project site and has been approved by the California Department of Toxic Substances Control (DTSC). The project would be required to implement the Asbestos Dust Mitigation Plan that is included in the RAW. As described on Draft EIR page 15-18, "the Asbestos Dust Mitigation Plan outlines engineering controls that must be used on site to reduce the risk of release of metals and NOA fibers into the environment during site clearing, excavation, grading, underground utility work, transportation, and disposal activities." The Asbestos Dust Mitigation Plan reflects the NSAQMD's standard approach and conditions for construction activity where NOA is likely to occur.

R-14 The comment states that the Draft EIR defers disclosure of human health risk resulting from the known hazardous materials within the project site. The comment states that the Draft EIR defers all analysis of impacts to compliance with the RAW and no attempt was made to assess the effectiveness or quantify the post-mitigation emissions or health risk.

The Draft EIR includes analysis of the air quality effects from implementation of the RAW. This includes equipment operation and haul trucks associated with excavating contaminated soil from the site and disposing of it offsite. As discussed in Impact 15-1, the RAW includes specific measures to "ensure that the remediation activities are carried out in a manner that does not create additional hazards." Specifically, this impact analysis identifies the primary potential pathways for human health effects associated with the contaminated soil, including "incidental ingestion, inhalation of airborne particulates, and dermal contact with the impacted soil" (Draft EIR page 15-15), and notes that the RAW includes a Site Safety Plan that would be implemented during all remediation activities. This page of the Draft EIR also summarizes the procedures that would be followed during site remediation:

> "During excavation, stockpiling and loading, workers would dampen soil as necessary, using water trucks or hoses, to reduce dust generation. Before removing the affected soil, vegetation removal would also be conducted in the areas to be excavated using hand-held mechanical equipment to minimize disturbance of soil prior to excavation, before being removed from the work area. The soil would then be stockpiled onto and covered with plastic sheeting, adjacent to the excavation. The covered soil would be loaded into trucks and transported to an off-site landfill for disposal."

The Site Safety Plan includes the industry-standard procedures and standards for the protection of human health during site remediation work. Compliance with the Site Safety Plan would control the potential for airborne emissions of the hazardous materials within the soil. As noted in the Draft EIR, the RAW has already been approved by DTSC, confirming that it meets all regulatory standards and best practices for completing site remediation in a way that will not result in exposure of construction workers or residents and employees at properties surrounding the project site to significant health hazards.

The Draft EIR also summarizes the conclusions of the RAW regarding the performance standards that must be met at the end of site remediation to ensure that the site is safe for the proposed commercial and residential land uses, such that the post-mitigation health risk

is below the regulatory standards. Specifically, it states "any mine waste and soil that would be consolidated and buried on site, or which would remain on site without consolidation and burial, must meet acceptable constituent concentration percentages, as identified in the RAW. Any remaining materials that exceed those percentages would be removed from the site (Appendix J-3A)." The constituent concentration percentages are established at levels that will protect human health, thus they are an appropriate performance standards to ensure that potential impacts associated with health risks due to the presence of contaminated soil would be reduced to less than significant.

R-15 The comment states that the Draft EIR must evaluate the combined effects of exposure to DPM and asbestos during construction.

Refer to Response to Comment R-12 regarding the potential exposure to TACs, including DPM, during construction and Response to Comment R-13 regarding implementation of the Asbestos Dust Mitigation Plan to reduce the risk of release of metals and NOA fibers during construction. As demonstrated in those responses, the project does not have a potential to create significant adverse health effects because construction particulate matter emissions would remain well-below applicable screening thresholds that are set to ensure protection of public health, and the project would implement industry-standard best practices for controlling the potential for airborne release of NOA.

R-16 The comment states that the Draft EIR is incorrect for suggesting that hazardous materials impacts are not cumulative, noting an example of the "area of asbestos emissions resulting from construction activities."

The referenced text in the Draft EIR has been revised to elaborate on the reasons why the potential hazardous materials impacts at the project site would not combine with other hazardous materials concerns that may arise in the cumulative condition. Airborne emissions of TAC and NOA that may occur at a given project site disperse as the distance from the emission source increases. The project site is an infill site, surrounded on all sides by existing development. There are no reasonably foreseeable projects in the near term or cumulative condition that would involve construction with the potential to generate asbestos emissions that could combine with any emissions from construction of this project. Further, as discussed in Response to Comment R-13, industry-standard best practices would be implemented during construction of the Dorsey Marketplace project to ensure that asbestos is not released from the project site.

R-17 The comment states that the Draft EIR relies on improper sources to exclude species from consideration and fails to identify protected plant species. The comment states that the Draft EIR improperly uses the CNDDB to determine that species are not present because the CNDDB is not an exhaustive or comprehensive inventory of rare species and natural communities and that field observations by qualified persons and using proper protocols are necessary. The comment states there is no support to suggest that numerous special status species are not present onsite.

The Draft EIR does not rely solely on the CNDDB records to determine whether species may be present at the project site. As described in Chapter 6, Biological Resources, a records search of the CNDDB was one of three special status species databases used to make review the range of special-status species that could occur in the project region. In addition, Dudek performed two site visits – March 4 and July 22, 2016. The July site visit was conducted at a time that the special-status plants with potential to occur onsite would be evident and identifiable, and none were observed. The comment is correct that the Draft EIR only identified the March site visit. As shown in Chapter 3, Draft EIR Text Revisions, the EIR has been revised to also document the July site visit, consistent with the Biological Technical Report. Refer to Responses to Comment G-5 and G-6 for additional discussion of the special status species that have potential to occur onsite.

R-18 The comment quotes the Draft EIR regarding the inability to identify special-status plant species during the initial site survey and states that an additional site survey should have been completed prior to release of the Draft EIR at an appropriate time to determine if special-status plant species are present. The comment also states that the Draft EIR cannot defer a wetland determination until after project approval. The comment then states that the lack of special status plants survey and wetland determination means that the Draft EIR is insufficient.

As discussed in Response to Comment R-17, a second site survey conducted in July 2016 was appropriately timed to identify special-status plants at the project site, and none were located onsite. Additionally, because plant populations change over time, Mitigation Measure 6a requires an additional survey for special-status plants prior to issuance of a grading permit and implementation of certain actions to ensure that impacts to any special-status plant species that may be encountered onsite remain less than significant.

Draft EIR pages 6-8 and 6-9 provide a description of the hydrologic features within the project site and their likely jurisdictional status. Text has been added to this section to more completely describe the methodology used to identify and evaluate these features. The methodology for mapping the features followed the criteria established by the U.S. Army Corps of Engineers, the Regional Water Quality Control Board, and the California Department of Fish and Wildlife. Thus the resources have been mapped, as shown in Draft EIR Figure 6-2, and assessed sufficient to support identification of potential impacts to them, as presented in Impact 6-3. Mitigation Measure 6f requires the acquisition of the necessary Clean Water Act Section 404 permit and Section 401 Water Quality Certification and defines a minimum ratio for compensatory mitigation required to reduce the impact to less than significant. The Draft EIR does not defer identification of the resources, evaluation of the impacts, or mitigation for the impact.

R-19 The comment states that the Draft EIR fails to assess cumulative biological impacts because it replicates the project-level analysis rather than considering the impacts of the project in conjunction with all related projects included in the cumulative condition. The comment states that the Draft EIR assumes that all impacts would be mitigated to a less than significant level based on the mitigation measures established in the project-level analysis, but that this

approach is contrary to CEQA because it avoids considering the incremental contribution to cumulative impacts.

The analysis of Impact 6-7 does not replicate the project-level analysis. Rather it defines the geographic scope for consideration of cumulative impacts, characterizes the biological resources present within this area, and summarizes the findings of the General plan EIR regarding biological resource impacts from buildout of the General Plan. As all projects within the cumulative scope would be within the purview of the City and its General Plan, all projects would subject to its plans and policies. The General Plan EIR found that potential cumulative impacts would all be reduced to less than significant levels through compliance with the General Plan and City ordinances, specifically requirements to ensure that projects result in "no net loss of habitat functions of values." Therefore, the General Plan EIR provides substantial evidence that cumulative impacts would remain less than significant. The analysis also notes that through implementation of the mitigation measures identified in the EIR, the project would comply with the General Plan and City ordinances, including those provisions that ensure there would not be a significant cumulative impact. Thus the EIR correctly concludes that there would be no significant cumulative impact to which the project could contribute.

R-20 The comment states that CEQA requires consideration of the severity of existing environmental impacts in order to determine whether the incremental impact caused by the project would be significant, that the Draft EIR fails to consider existing and foreseeable cumulative effects, and the Draft EIR must be revised and recirculated.

The discussion of Impact 6-7 has been expanded to provide more information regarding the severity of existing and anticipated cumulative impacts to biological resources within the City of Grass Valley. This additional description does not affect the impact analysis or conclusion that there would be no significant cumulative impact to which the project could contribute.

R-21 The comment quotes Draft EIR text that summarizes the findings of the General Plan EIR regarding biological resource impacts. The comment states that the Draft EIR is trying to tier from the City's General Plan EIR but does not follow the CEQA mandates for tiering from an EIR. The comment states that tiering from the General Plan EIR wouldn't be possible because the General Plan EIR does not include the proposed project in that the project requires a general plan amendment. The comment then states that the Draft EIR does not explain how unspecified policy and plan compliance will result in a less than significant impact for all biological impacts. A footnote to the comment states that while the Draft EIR gives one example of policy requirements, it is unclear whether it is intended to be exhaustive because the actual take of protected species is separate from habitat loss.

CEQA Guidelines Section 15130(d) allows that the cumulative impact analysis may draw from a previously approved land use document and that "a pertinent discussion of cumulative impacts contained in one or more previously certified EIRs may be incorporated by reference pursuant to the provisions for tiering and program EIRs. No further cumulative impacts analysis is required when a project is consistent with a general, specific, master or comparable

programmatic plan where the lead agency determines that the regional or areawide cumulative impacts of the proposed project have already been adequately addressed, as defined in section 15152(f), in a certified EIR for that plan."

The comment is correct that under this CEQA Guideline the Draft EIR must incorporate the General Plan EIR by reference. Text has been added to the Draft EIR to explicitly incorporate the General Plan EIR. This does not constitute significant new information because it does not alter the impact analysis or conclusions of the Draft EIR, there are no new significant impacts or substantial increases in impacts, it does not identify feasible ways to mitigate project impacts or feasible project alternatives, and the General Plan EIR was previously cited as a reference source for the EIR and is publically available. Thus the public has not been deprived of a meaningful opportunity to comment on the project's environmental effects, mitigation, or alternatives.

While the project does require a General Plan Amendment to allow development of the proposed land uses, this does not make the project inconsistent with the General Plan or General Plan EIR in relation to the consideration of impacts to biological resources. The project site is an infill Brownfield site designated for urban development, which necessitates site remediation. The project-level impacts to biological resources present at the project site would be largely the same under the existing Business Park land use designation as under the proposed Commercial and Urban High Density designations. Thus, the Draft EIR correctly uses the General Plan and General Plan EIR to establish a cumulative environmental setting from which to evaluate the potential for significant cumulative impacts to biological resources. As the General Plan governs the entirety of the cumulative impact analysis area, the conclusions of the General Plan EIR with regards to the cumulative analysis inform the cumulative analysis of the proposed project. The mitigation measure identified in the project-specific analysis would ensure that the proposed project is compliant with the General Plan policies and therefore be consistent with the impact significance level found in the General Plan EIR.

R-22 The comment states that the Draft EIR is internally inconsistent in addressing the project's contribution to cumulative impacts related to sewer system capacity. The comment quotes text in the executive summary that states the project would be required to contribute a fair-share amount to future wastewater system capacity improvements, while Chapter 14 finds the impact less than significant and does not require any mitigation. The comment also states that the characterization of the project's impact as "minimal" does not meet CEQA requirements to evaluate cumulative impacts. The comment states that the Draft EIR should be revised and recirculated to state that the impact is significant and requires mitigation.

The comment does not correctly interpret the data presented in Impact 14-4 regarding the contribution of the proposed project to cumulative sewage flows. As documented in Impact 14-4, the Grass Valley Wastewater Treatment Plant (WWTP) has a current capacity of 2.78 million gallons per day (mgd) and is expected to have average dry weather flow (ADWF) of 2.1 mgd in the long term. Alternative A would contribute 0.031 mgd and Alternative B would contribute 0.035 mgd; this represents a 1.47% contribution under Alternative A and a 1.67% contribution under Alternative B in the long term.

The analysis finds that the potential for cumulative impacts is related to the capacity of the sewer lines to convey flows to the WWTP, noting that storm events could cause peak flows that result in surcharging at several locations. The analysis states that there is one manhole location (manhole I17-7) that would convey sewage flows from the Dorsey Marketplace project and is likely to experience surcharging in near-term conditions. At this location the proposed project would contribute 12.6% of the flows. The analysis also states that there are three manholes that are likely to experience surcharging in long-term conditions to which the project would contribute flows. In these locations, the project would contribute between 11.2% and 15.5% of the flows.

The City is currently implementing the Wastewaster Master Plan, which identifies improvements that resolve the deficiencies of the existing wastewater collection and treatment facilities and provides for construction of identified improvements by including them in the City's CIP. The Master Plan also outlines alternatives for each stage to ensure that the wastewater system will continue to operate an acceptable service levels. Under City ordinances, the project would be required to pay the City's wastewater system development fees at the time that building permits are issued. The fees are determined based on the size of the project for which the building permit is requested in terms of the Equivalent Dwelling Units included in the project. This would ensure that the project is contributing a fair-share amount to the City's implementation of the Wastewater Master Plan. Because payment of this fee is required by City policy and is assessed on every building permit issued within the City's wastewater treatment service area, it is not necessary to identify payment of the fee as a mitigation measure.

R-23 The comment states that the revised EIR needs to propose a lawful mitigation strategy for the proposed project's cumulative impact instead of requiring the City to address the cumulative impact through the Wastewater Master Plan. The comment states that the City acknowledged the impact as significant and thus has a duty to set forth all feasible mitigation measures, which may include requiring the Project to construct its own sewage containment system, to be solely responsible for system-wide upgrades and later seek reimbursement, or another unspecified solution. Finally, the comment suggests that the mitigation could include an impact fee or assessment to provide a fair-share contribution for the improvement or if the City finds there is no feasible mitigation, the impact must be identified as significant and unavoidable.

As discussed in Response to Comment R-22, the Draft EIR found that Alternative A and Alternative B would have a less than significant contribution to cumulative effects on the wastewater treatment system because the project applicant would be required to pay the City's wastewater system development fees at the time that building permits are issued. The analysis recognizes the potential significant impacts due to surcharging, but also demonstrates that the City has an adopted program to ensure adequate near-term and long-term sewage conveyance capacity and the project would contribute a fair-share amount towards the City's implementation of the Wastewater Master Plan. Thus the Draft EIR properly concludes the impact is less than significant.

CHAPTER 2
RESPONSES TO COMMENTS

This chapter contains comment letters received during the public review period for the Draft EIR, which concluded on May 6, 2019. In conformance with Section 15088(a) of the CEQA Guidelines, written responses were prepared addressing comments on environmental issues received from reviewers of the Draft EIR.

Table 1-1 in Chapter 1, Introduction, presents the list of commenters, including the binomial designation for each comment letter received, the author of the comment letter, and the date of the comment letter. The City of Grass Valley received two comment letters on the Draft EIR after the public review period closed. Although the City is not required to provide formal responses to these comment letters because they were not received within the established public review period, they have been included in this Final EIR to ensure that that all comments on the Draft EIR are clearly and appropriately addressed.

A public hearing to receive comments on the Draft EIR was held on April 16, 2010 during the regular meeting of the City of Grass Valley Planning Commission. Public comments regarding the environmental effects of the proposed project or the content of the Draft EIR received at the public hearing are summarized and responded to as Comment Letter T.

INTENTIONALLY LEFT BLANK

Comment Letter A

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Gavin Newsom
Governor

Kate Gordon
Director

May 7, 2019

Thomas Last
Grass Valley, City of
125 E Main Street
Grass Valley, CA 95945

Subject: Dorsey Marketplace Project
SCH#: 2016022053

Dear Thomas Last:

The State Clearinghouse submitted the above named EIR to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on 5/6/2019, and the comments from the responding agency (ies) is (are) available on the CEQA database for your retrieval and use. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

Check the CEQA database for submitted comments for use in preparing your final environmental document: https://ceqanet.opr.ca.gov/2016022053/2 . Should you need more information or clarification of the comments, **we recommend that you contact the commenting agency directly.**

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

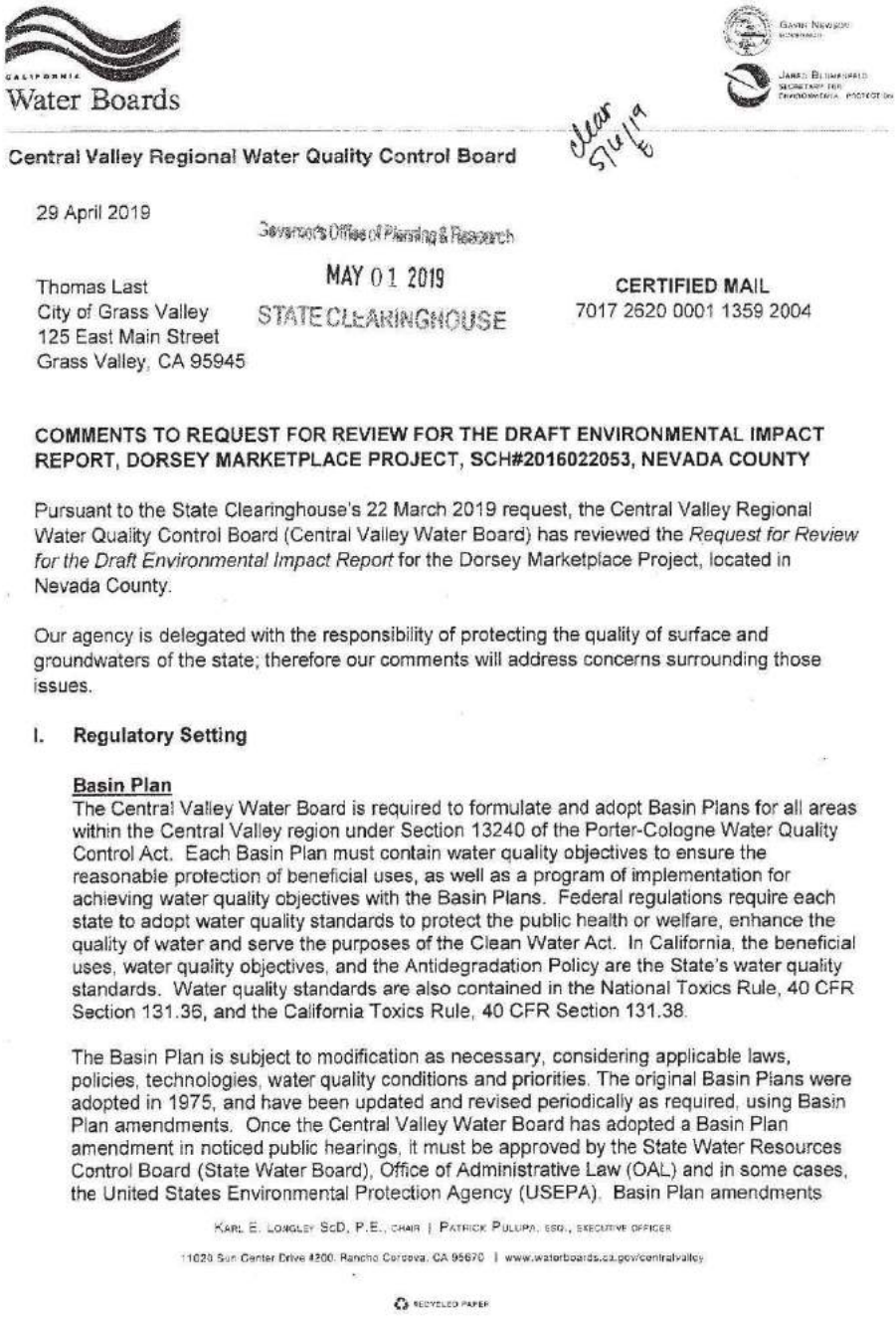
Sincerely,

Scott Morgan
Director, State Clearinghouse

cc: Resources Agency

A-1

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL 1-916-445-0613 state.clearinghouse@opr.ca.gov www.opr.ca.gov



CALIFORNIA
Water Boards

GAVIN NEWSOM
GOVERNOR

JARED BLUMENFELD
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

clear 5/14/19 E

29 April 2019

Governor's Office of Planning & Research

MAY 01 2019

STATE CLEARINGHOUSE

Thomas Last
City of Grass Valley
125 East Main Street
Grass Valley, CA 95945

CERTIFIED MAIL
7017 2620 0001 1359 2004

COMMENTS TO REQUEST FOR REVIEW FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, DORSEY MARKETPLACE PROJECT, SCH#2016022053, NEVADA COUNTY

Pursuant to the State Clearinghouse's 22 March 2019 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Draft Environmental Impact Report* for the Dorsey Marketplace Project, located in Nevada County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

I. Regulatory Setting

Basin Plan

The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38.

The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically as required, using Basin Plan amendments. Once the Central Valley Water Board has adopted a Basin Plan amendment in noticed public hearings, it must be approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law (OAL) and in some cases, the United States Environmental Protection Agency (USEPA). Basin Plan amendments

KARL E. LONGLEY ScD, P.E., CHAIR | PATRICK PULUPA, ESQ., EXECUTIVE OFFICER

11020 Sun Center Drive #200, Rancho Cordova, CA 95670 | www.waterboards.ca.gov/centralvalley

RECYCLED PAPER

A-2

only become effective after they have been approved by the OAL and in some cases, the USEPA. Every three (3) years, a review of the Basin Plan is completed that assesses the appropriateness of existing standards and evaluates and prioritizes Basin Planning issues.

For more information on the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins*, please visit our website:
http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

Antidegradation Considerations
All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The Antidegradation Implementation Policy is available on page 74 at:
https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf

In part it states:

Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.

This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives.

A-2 cont.

The antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System and land discharge Waste Discharge Requirements (WDRs) permitting processes. The environmental review document should evaluate potential impacts to both surface and groundwater quality.

II. Permitting Requirements

Construction Storm Water General Permit
Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]
The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit
Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 2014-0057-DWQ.

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml

Clean Water Act Section 404 Permit
If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACE). If a Section 404 permit is required by the USACE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements.

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACE at (916) 557-5250.

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

A-2 cont.

Clean Water Act Section 401 Permit – Water Quality Certification
If an USACE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 10 of the Rivers and Harbors Act or Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications.

For more information on the Water Quality Certification, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/

Waste Discharge Requirements – Discharges to Waters of the State
If USACE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation.

For more information on the Waste Discharges to Surface Water NPDES Program and WDR processes, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_surface_water/

Dewatering Permit
If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Risk General Order) 2003-0003 or the Central Valley Water Board's Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Risk Waiver) R5-2013-0145. Small temporary construction dewatering projects are projects that discharge groundwater to land from excavation activities or dewatering of underground utility vaults. Dischargers seeking coverage under the General Order or Waiver must file a Notice of Intent with the Central Valley Water Board prior to beginning discharge.

For more information regarding the Low Risk General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf

For more information regarding the Low Risk Waiver and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2013-0145_res.pdf

Regulatory Compliance for Commercially Irrigated Agriculture
If the property will be used for commercial irrigated agricultural, the discharger will be required to obtain regulatory coverage under the Irrigated Lands Regulatory Program.

A-2 cont.

There are two options to comply:

1. **Obtain Coverage Under a Coalition Group.** Join the local Coalition Group that supports land owners with the implementation of the Irrigated Lands Regulatory Program. The Coalition Group conducts water quality monitoring and reporting to the Central Valley Water Board on behalf of its growers. The Coalition Groups charge an annual membership fee, which varies by Coalition Group. To find the Coalition Group in your area, visit the Central Valley Water Board's website at: https://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/regulatory_information/for_growers/coalition_groups/ or contact water board staff at (916) 464-4611 or via email at IrrLands@waterboards.ca.gov.

2. **Obtain Coverage Under the General Waste Discharge Requirements for Individual Growers, General Order R5-2013-0100.** Dischargers not participating in a third-party group (Coalition) are regulated individually. Depending on the specific site conditions, growers may be required to monitor runoff from their property, install monitoring wells, and submit a notice of intent, farm plan, and other action plans regarding their actions to comply with their General Order. Yearly costs would include State administrative fees (for example, annual fees for farm sizes from 11-100 acres are currently $1,277 + $8.53/Acre); the cost to prepare annual monitoring reports; and water quality monitoring costs. To enroll as an Individual Discharger under the Irrigated Lands Regulatory Program, call the Central Valley Water Board phone line at (916) 464-4611 or e-mail board staff at IrrLands@waterboards.ca.gov.

A-2 cont.

Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Limited Threat Discharges to Surface Water* (Limited Threat General Order). A complete Notice of Intent must be submitted to the Central Valley Water Board to obtain coverage under the Limited Threat General Order.

For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016-0076-01.pdf

NPDES Permit

If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. A complete Report of Waste Discharge must be submitted with the Central Valley Water Board to obtain a NPDES Permit.

For more information regarding the NPDES Permit and the application process, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/help/permit/

If you have questions regarding these comments, please contact me at (916) 464-4812 or Jordan.Hensley@waterboards.ca.gov.

Jordan Hensley
Environmental Scientist

cc: State Clearinghouse unit, Governor's Office of Planning and Research, Sacramento

A-2 cont.

#2016022053

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY Gavin Newsom, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 3
703 B STREET
MARYSVILLE, CA 95901
PHONE (530) 741-4286
FAX (530) 741-4245
TTY 711
www.dot.ca.gov/dist3

Making Conservation a California Way of Life.

clear 5/6/19

Governor's Office of Planning & Research
MAY 06 2019
STATE CLEARINGHOUSE

May 6, 2019

GTS# 03-NEV-2019-00106
03-NEV-20 PM 14.246

Thomas Last
City of Grass Valley
125 East Main Street
Grass Valley, CA 95945

Dorsey Marketplace

Dear Thomas Last:

Thank you for including the California Department of Transportation (Caltrans) in the Certification of the Draft Environmental Impact Report review process. The mission of Caltrans is to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability. The Local Development-Intergovernmental Review (LD-IGR) Program reviews land use projects and plans through the lenses of our mission and state planning priorities of infill, conservation, and travel-efficient development. To ensure a safe and efficient transportation system, we encourage early consultation and coordination with local jurisdictions and project proponents on all development projects that utilize the multimodal transportation network.

This project site is currently designated under the General Plan as Business Park and zoned Corporate Business Park. This EIR evaluates two Project Alternatives with an equal weight environmental analysis. Both Alternative A and Alternative B require a General Plan Amendment and rezone to change land currently designated for Business Park to Commercial and Residential Urban High Density and a rezone from Corporate Business Park to Commercial (C-2) and Multiple Dwelling Residential (R-3). Alternative A proposes to develop approximately 178,960 sq. foot of commercial building space and 90 multiple-family dwelling units. Alternative B proposes to develop approximately 104,350 sq. foot of commercial building space, 8,500 sq. foot of office space and 171 multiple-family dwelling units. The development review application covers the site plan and project design, while the use permit application is for the drive-through uses. The proposed project site is located on a vacant 27-acre parcel southeast of the intersection of State Route 49/20 northbound ramps and Dorsey Drive in Grass Valley, California. The following comments are based on the documents received.

Forecasting and Modeling

The impact to the state highway system seems to be misrepresented in the Draft EIR. The trip generation for Alternative A reported in the Draft EIR, is 478 AM peak hour trips and 865 PM peak hour trips. The trip distribution map provided in the Traffic Impact Analysis Report shows about 20 percent of the trips will travel SB State Route 49 (SR 49) and about 15% of the trips will travel NB SR 49. Table 8-6 in the DEIR does not represent the correct significant trip

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"

A-3

numbers being added to the freeway; thus, Alternative A under existing, plus project conditions, will significantly impact SR 20/SR 49. The trip numbers for Table 8-7 should also be verified for Alternative B. Please apply corrections or provide reasoning for the trip numbers in both Table 8-6 & 8-7. Horizon years should be taken 20 years after the project completion year. Please provide the project completion year and analyze the following: cumulative conditions, cumulative conditions plus proposed project, and the 20-year cumulative conditions, after construction.

Traffic Operations

Figure 8 – Year 2035 Plus Project Peak Hour Traffic Volumes (Alternative A) of the February 2019 Traffic Impact Analysis Report, estimates 226 vehicles per hour in the PM peak hour. This is below the threshold of 300 VPH, for which dual left-turn lanes, are needed. However, any future development or redevelopment along Dorsey Drive or the extension of Dorsey Drive beyond Sutton Way, would likely exceed that threshold. Future widening of the southbound off-ramp to provide dual left turn lanes, and widening of the overcrossing structure to accommodate a second eastbound through lane, will be costly. Caltrans doesn't request any payment of mitigation funds towards this possible future project. However, we do request the City of Grass Valley require widening of Dorsey Drive, to provide two eastbound lanes immediately east of Intersection 8, to the project driveway. This will allow future improvements to the interchange, with little or no impact, outside of Caltrans right of way.

A-3 cont.

The other mitigation measures listed in the Traffic Impact Analysis Report and the Draft EIR are appropriate and acceptable to Caltrans.

Hydraulics-Stormwater

No detailed drainage plans, calculations or drawings, and hydraulic/hydrology study or report showing the "pre" and "post" construction plans have been received by Caltrans Marysville Hydraulics Branch.

In order, to adequately evaluate the project's hydrologic or hydraulics impacts upon the State's right of way (ROW) and Caltrans drainage facilities in the project's area, Caltrans would recommend that these documents are submitted to Caltrans when they become available. The document should determine whether the project will:

- Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which would result in substantial siltation on or off-site which will affect the State's or Caltrans' drainage facilities?
- Alter the existing drainage pattern of the area in a manner which will overwhelm the capacities of the existing drainage facilities?
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial and additional sources of pollution?
- Place houses within a 100-year flood zone as mapped out on the Federal Insurance Rate Map (FIRM)?

No net increase to the 100-year storm event peak discharge may be realized within the State's highway right of way (ROW). The owner must maintain or improve existing drainage patterns and or facilities affected by the proposed project to Caltrans standard. Runoff from the proposed project that will enter the State's ROW and or Caltrans drainage facilities, must meet all Lahontan Regional Water Quality Control Board water quality standards. Appropriate storm water quality best management practices (BMP's) should be applied on the project's site, to ensure that runoff from the site, meets the Lahontan Regional Water Quality Control Board Standards. Once the BMP's are installed, the owner must ensure that they are properly maintained.

Encroachment Permits

Per the drawings shown in the documents, the project does not appear to encroach onto the State's right of way. However, if the proposed project affects State highway facilities, an encroachment permit will be required.

All work proposed and performed within the State's highway right of way must be in accordance with Caltrans' standards and require a Caltrans Encroachment Permit prior to commencing construction.

A-3 cont.

Please provide our office with copies of any further actions regarding this project or future development of the property. We would appreciate the opportunity to review and comment on any changes/updates related to this project.

If you have any question regarding these comments or require additional information, please contact Kena Sannar, Intergovernmental Review Coordinator for Nevada County, by phone (530) 634-7613 or via email to kena.sannar@dot.ca.gov.

Sincerely,

KEVIN YOUNT, Branch Chief
Office of Transportation Planning
Regional Planning Branch—East

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"

Response to Comment Letter A

Office of Planning and Research
Scott Morgan
May 7, 2019

A-1 The comment acknowledges receiving the EIR and that the City has complied with the State Clearinghouse review requirements.

The comment does not address the accuracy or adequacy of the EIR or the environmental effects of the project; no response required.

A-2 The comment comprises a letter submitted to the State Clearinghouse from the Central Valley Regional Water Quality Control Board.

The Central Valley Regional Water Quality Control Board letter is included separately as Comment Letter D. Responses to each of the individual comments in this letter are provided in Responses to Comments D-1 through D-16.

A-3 The comment comprises a letter submitted to the State Clearinghouse from the California Department of Transportation.

The California Department of Transportation letter is included separately as Comment Letter B. Responses to each of the individual comments in this letter are provided in Responses to Comments B-1 through B-9.

INTENTIONALLY LEFT BLANK

Comment Letter B

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY Gavin Newsom, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 3
703 B STREET
MARYSVILLE, CA 95901
PHONE (530) 741-4286
FAX (530) 741-4245
TTY 711
www.dot.ca.gov/dist3

Making Conservation a California Way of Life.

May 6, 2019

GTS# 03-NEV-2019-00106
03-NEV-20 PM 14.246

Thomas Last
City of Grass Valley
125 East Main Street
Grass Valley, CA 95945

Dorsey Marketplace

Dear Thomas Last:

Thank you for including the California Department of Transportation (Caltrans) in the Certification of the Draft Environmental Impact Report review process. The mission of Caltrans is to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability. The Local Development-Intergovernmental Review (LD-IGR) Program reviews land use projects and plans through the lenses of our mission and state planning priorities of infill, conservation, and travel-efficient development. To ensure a safe and efficient transportation system, we encourage early consultation and coordination with local jurisdictions and project proponents on all development projects that utilize the multimodal transportation network.

This project site is currently designated under the General Plan as Business Park and zoned Corporate Business Park. This EIR evaluates two Project Alternatives with an equal weight environmental analysis. Both Alternative A and Alternative B require a General Plan Amendment and rezone to change land currently designated for Business Park to Commercial and Residential Urban High Density and a rezone from Corporate Business Park to Commercial (C-2) and Multiple Dwelling Residential (R-3). Alternative A proposes to develop approximately 178,960 sq. foot of commercial building space and 90 multiple-family dwelling units. Alternative B proposes to develop approximately 104,350 sq. foot of commercial building space, 8,500 sq. foot of office space and 171 multiple-family dwelling units. The development review application covers the site plan and project design, while the use permit application is for the drive-through uses. The proposed project site is located on a vacant 27-acre parcel southeast of the intersection of State Route 49/20 northbound ramps and Dorsey Drive in Grass Valley, California. The following comments are based on the documents received.

B-1

Forecasting and Modeling

The impact to the state highway system seems to be misrepresented in the Draft EIR. The trip generation for Alternative A reported in the Draft EIR, is 478 AM peak hour trips and 865 PM peak hour trips. The trip distribution map provided in the Traffic Impact Analysis Report shows about 20 percent of the trips will travel SB State Route 49 (SR 49) and about 15% of the trips will travel NB SR 49. Table 8-6 in the DEIR does not represent the correct significant trip

B-2

numbers being added to the freeway; thus, Alternative A under existing, plus project conditions, will significantly impact SR 20/SR 49. The trip numbers for Table 8-7 should also be verified for Alternative B. Please apply corrections or provide reasoning for the trip numbers in both Table 8-6 & 8-7. Horizon years should be taken 20 years after the project completion year. Please provide the project completion year and analyze the following: cumulative conditions, cumulative conditions plus proposed project, and the 20-year cumulative conditions, after construction. B-2 Cont. B-3

Traffic Operations

Figure 8 – Year 2035 Plus Project Peak Hour Traffic Volumes (Alternative A) of the February 2019 Traffic Impact Analysis Report, estimates 226 vehicles per hour in the PM peak hour. This is below the threshold of 300 VPH, for which dual left-turn lanes, are needed. However, any future development or redevelopment along Dorsey Drive or the extension of Dorsey Drive beyond Sutton Way, would likely exceed that threshold. Future widening of the southbound off-ramp to provide dual left turn lanes, and widening of the overcrossing structure to accommodate a second eastbound through lane, will be costly. Caltrans doesn't request any payment of mitigation funds towards this possible future project. However, we do request the City of Grass Valley require widening of Dorsey Drive, to provide two eastbound lanes immediately east of Intersection 8, to the project driveway. This will allow future improvements to the interchange, with little or no impact, outside of Caltrans right of way. B-4

The other mitigation measures listed in the Traffic Impact Analysis Report and the Draft EIR are appropriate and acceptable to Caltrans. B-5

Hydraulics-Stormwater

No detailed drainage plans, calculations or drawings, and hydraulic/hydrology study or report showing the "pre" and "post" construction plans have been received by Caltrans Marysville Hydraulics Branch.

In order, to adequately evaluate the project's hydrologic or hydraulics impacts upon the State's right of way (ROW) and Caltrans drainage facilities in the project's area, Caltrans would recommend that these documents are submitted to Caltrans when they become available. The document should determine whether the project will: B-6

- Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which would result in substantial siltation on or off-site which will affect the State's or Caltrans' drainage facilities?
- Alter the existing drainage pattern of the area in a manner which will overwhelm the capacities of the existing drainage facilities?
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial and additional sources of pollution?
- Place houses within a 100-year flood zone as mapped out on the Federal Insurance Rate Map (FIRM)?

No net increase to the 100-year storm event peak discharge may be realized within the State's highway right of way (ROW). The owner must maintain or improve existing drainage patterns and or facilities affected by the proposed project to Caltrans standard. Runoff from the proposed project that will enter the State's ROW and or Caltrans drainage facilities, must meet all Lahontan Regional Water Quality Control Board water quality standards. Appropriate storm water quality best management practices (BMP's) should be applied on the project's site, to ensure that runoff from the site, meets the Lahontan Regional Water Quality Control Board Standards. Once the BMP's are installed, the owner must ensure that they are properly maintained.

B-7

Encroachment Permits

Per the drawings shown in the documents, the project does not appear to encroach onto the State's right of way. However, if the proposed project affects State highway facilities, an encroachment permit will be required.

B-8

All work proposed and performed within the State's highway right of way must be in accordance with Caltrans' standards and require a Caltrans Encroachment Permit prior to commencing construction.

Please provide our office with copies of any further actions regarding this project or future development of the property. We would appreciate the opportunity to review and comment on any changes/updates related to this project.

If you have any question regarding these comments or require additional information, please contact Kena Sannar, Intergovernmental Review Coordinator for Nevada County, by phone (530) 634-7613 or via email to kena.sannar@dot.ca.gov.

B-9

Sincerely,

KEVIN YOUNT, Branch Chief
Office of Transportation Planning
Regional Planning Branch—East

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"

INTENTIONALLY LEFT BLANK

Response to Comment Letter B

Caltans
Kevin Yount
May 6, 2019

B-1 The comment identifies Caltrans' mission and summarizes the proposed project.

The comment does not address the adequacy or content of the Draft EIR or the project's environmental effects and no response is required.

B-2 The comment states that the trip generation and distribution calculations for Alternative A are not accurately represented in Draft EIR Table 8-6, and Alternative A would result in significant impacts to SR 20/49. The comment states that trip numbers in Table 8-7 (Alternative B) should also be verified, and that the cumulative scenario should be 20 years after project completion.

It is important to note that the Traffic Impact Analysis Report (TIAR) and the Draft EIR have Alternatives A and B reversed. Draft EIR Table 8-6 correlates to TIAR Table 21.

The existing plus project traffic volumes shown in Table 8-6 indicate that in the AM peak hour, Alternative A would result in 51 additional vehicles on SR 20/49 south of Bennett Street northbound, 16 additional vehicles on SR 20/49 Brunswick loop on-ramp southbound, and 68 additional vehicles on SR 20/49 south of Bennett southbound; and in the PM peak hour Alternative A would result in 61 additional vehicles on SR 20/49 south of Bennett Street northbound, 21 additional vehicles on SR 20/49 Brunswick loop on-ramp southbound, and 67 additional vehicles on SR 20/49 south of Bennett southbound. These values reflect the trip distribution assumptions shown in Figure 5A of the TIAR, which identifies distribution of the total daily trips generated by the project, rather than trip distribution for each peak hour.

There is one typographical error in Table 8-6, for the weave from Dorsey Drive to southbound Idaho-Maryland Road. For the existing plus project conditions, the Draft EIR reports the AM peak hour density at 14.9 passenger cars per mile per lane and the PM peak hour density at 19.0. The TIAR reports the correct densities as 12.6 in the AM peak hour and 15.2 in the PM peak hour. The Level of Service (LOS) remains at LOS B for both peak hours at this location. This error has been corrected as shown in Chapter 3, Draft EIR Text Revisions. As shown in Table 8-6, the LOS for all studied facilities remains at LOS C or better, thus the TIAR and Draft EIR correctly state that Alternative A would have less than significant impacts to SR 20/49 traffic volumes under the existing plus project conditions.

Table 8-7 provides the existing and existing plus project SR 20/49 traffic volumes under Alternative B. Similar to Table 8-6, the LOS for all studied facilities remains at LOS C or better, thus the TIAR and Draft EIR correctly state that Alternative B would have less than significant impacts to SR 20/49 traffic volumes under the existing plus project conditions.

The traffic analysis considers cumulative impacts in the year 2035 because this is consistent with the City and Regional traffic model, which currently uses 2035 as the cumulative year

benchmark for all traffic studies in western Nevada County. The environmental review for this project began in 2016, with publication of the Notice of Preparation for this EIR, as noted in Section 1.6 of the Draft EIR. Thus the cumulative scenario considers the project's contribution to cumulative impacts 19 years after commencement of the environmental review. This is a reasonable horizon and provides a reliable and meaningful analysis of the project's contribution to cumulative traffic impacts.

Draft EIR Table 8-11 identifies the project's impacts to Caltrans facilities under the cumulative plus Alternative A conditions, while Draft EIR Table 8-13 identifies the project's impacts to Caltrans facilities under the cumulative plus Alternative B conditions. These tables show that all SR 20/49 facilities would continue to operate at an acceptable LOS under Year 2035 plus project conditions for either alterative. Therefore, the cumulative impacts to SR 20/49 facilities under either alternative would remain less than significant (refer to Draft EIR Impact 8-9).

As discussed in Draft EIR Impact 8-9, the TIAR and Draft EIR identify that a significant and unavoidable impact under Alternative A would occur due to vehicle queues that exceed available storage at the Dorsey Drive/SR 20/49 ramps by between 4 and 21 vehicles. As stated in the Draft EIR, improving these conditions would require reconstruction of the Dorsey Drive interchange to add additional lanes or create a multi-lane roundabout interchange. Under Alternative B, the vehicle queues would slightly exceed available storage but would not adversely affect traffic operations, thus impacts would remain less than significant.

B-3 The comment states that the traffic analysis should consider the following scenarios: cumulative conditions, cumulative conditions plus proposed project, and the cumulative conditions 20 years after project construction.

As discussed in Response to Comment B-2 above, use of the year 2035 to evaluate cumulative conditions is consistent with the City and regional traffic model. Further, it reflects conditions 19 years beyond the time that the environmental review for this project began (CEQA Guidelines Section 15125(a)(1) states that generally a lead agency should consider the baseline condition as that which exists at the time the notice of preparation is prepared) and provides a reliable and meaningful analysis of the project's contribution to cumulative impacts. CEQA does not require multiple cumulative scenarios, thus it is not necessary to evaluate cumulative conditions 20 years after project construction is complete.

B-4 The comment states that the TIAR estimates that in the cumulative plus project condition there would be 226 vehicles per hour in the PM peak hour, which is below the threshold at which dual left-turn lanes would be needed (at 300 vehicles per hour). This comment is understood to refer to intersection location 7, which is the intersection of Dorsey Drive, SR 20/49 southbound/eastbound on-ramp, and Joerschke Drive. The comment states that future development or redevelopment along Dorsey Drive would likely generate traffic volumes that do exceed that threshold. The comment identifies that future widening of the southbound off-ramp to provide dual left-turn lanes and widening the overcrossing structure to accommodate a second eastbound through lane would be needed, and would be costly. Caltrans requests that the City require the project to widen Dorsey Drive to provide two eastbound lanes between

the SR 20/49 NB/WB ramps and the project driveway to allow future improvements to the interchange.

As shown in TIAR Figure 7, in the cumulative no project condition, it is expected that there would be 140 vehicles per hour in the PM peak hour making this left-turn movement. Under Alternative B (as described in the Draft EIR), this would increase to 226 vehicles as noted in this comment. Draft EIR Table 8-12 shows that this intersection would operate at LOS B under 2035 no project conditions and LOS D under 2035 plus Alternative B conditions. As shown in Draft EIR Table 8-10, under 2035 plus Alternative A conditions, the intersection would operate at LOS F in the PM peak hour. As shown in the site plans in Draft EIR Figures 2-4 and 2-5, Dorsey Drive is proposed to have two eastbound lanes immediately east of Intersection 8 and a right-turn lane into the project site entrance under both Alternative A and Alternative B. Thus the proposed improvements to Dorsey Drive included in the project are consistent with the recommendation made in this comment to provide two eastbound lanes.

B-5 The comment states that the other mitigation measures identified in the Traffic Impact Analysis Report and Draft EIR are appropriate and acceptable to Caltrans.

The comment confirms the adequacy of the other mitigation measures in the Draft EIR and no response is required.

B-6 The comment states that the Caltrans Marysville Hydraulics Branch has not received detailed drainage plans, calculations or drawings, or a hydraulic/hydrology report showing pre and post project runoff. The comment requests that these documents be provided to Caltrans to allow evaluation of the project's hydrologic or hydraulic impacts upon the State's right of way and Caltrans drainage facilities in the vicinity.

Appendix K of the Draft EIR contains the Drainage Report by Genesis Engineering, which included a preliminary hydraulics analysis, preliminary post-construction design and low-impact design (LID) calculations. As discussed in Impact 13-2 in Chapter 13, Hydrology and Water Quality, Alternative A and Alternative B would result in a less than significant impact associated with stormwater runoff because the proposed storage areas provide more capacity than the minimum capacity necessary to accommodate runoff from the 2-year, 10-year, and 100-year storm events. Thus the proposed stormwater management measures would be sufficient to ensure that the project does not increase stormwater runoff rates from the project site.

B-7 The comment states that there can be no net increase in 100-year storm event peak discharge in Caltrans right of way (ROW) and that the owner of the project site must maintain or improve existing drainage patterns. Additionally, all runoff must meet the Regional Water Quality Control Board water quality standards and appropriate storm water Best Management Practices (BMPs) should be installed and properly maintained.

As discussed in Response to Comment B-7 above, both Alternative A and Alternative B would have a less than significant impact with regards to storm water runoff. As outlined in Draft EIR Section 13.2, the project site is within the jurisdiction of the Central Valley Regional Water

Quality Control Board. As demonstrated in the analysis of Impact 13-2 in Chapter 13, under either project alternative, the stormwater detention basins would be sufficient to accommodate increased rates and volumes of stormwater runoff from the project site. Three detention basins would be created, and each provides more stormwater storage capacity than is anticipated to be required to accommodate stormwater runoff during the 2-year, 10-year, and 100-year storm events.

Therefore, under either alternative, the project's potential to cause a substantial increase in rate or volume of runoff leaving the site, including stormwater runoff to adjacent Caltrans facilities, is less than significant.

As discussed in Impact 13-5, Alternative A and Alternative B would be subject to the National Pollutant Discharge Elimination System (NPDES) MS4 permit and would be required to comply with BMPs in the City of Grass Valley Stormwater Management Plan; LID measures to reduce pollutants; the City's Grading Ordinance (Municipal Code, Chapter 12.04 12.06.120); General Plan policies related to hydrology and water quality; and the General Construction NPDES permit. As such, both Alternatives

B-8 The comment states that while the project plans do not show encroachment into Caltrans Right-of-Way, should the project encroach, an encroachment permit would be required and all work would need to adhere to Caltrans standards.

The comment is correct that project plans indicate that project construction is not expected to encroach into Caltrans ROW. If it is determined that construction may require encroachment into the Caltrans ROW, the City and project applicant will consult with Caltrans, request an encroachment permit, and ensure that all work adheres to Caltrans standards. The comment does not address the content of the EIR or the project's environmental effects and no further response is necessary.

B-9 The comment requests copies of any further actions and provides contact information.

The City will continue to consult with and provide the requested project information to Caltrans. The comment does not address the content of the EIR or the project's environmental effects and no response is necessary.

Comment Letter C

Katherine Waugh

From: Tom Last <toml@cityofgrassvalley.com>
Sent: Thursday, April 11, 2019 4:23 PM
To: Katherine Waugh
Cc: Abigail Walker
Subject: FW: Dorsey Marketplace Project SCH# 2016022053

Katherine a comment on the DEIR.

Abby, can you please help me create a file for all comments received on the DEIR. Maybe include a spreadsheet so we can track when they come in and when we send to Katherine at Dudek.

Thanks

Thomas Last | Community Development Director
City of Grass Valley | Community Development Department | 125 E. Main Street | Grass Valley, CA 95945
Phone: (530) 274-4711 Email: toml@cityofgrassvalley.com | Web: www.cityofgrassvalley.com

From: Totton, Gayle@NAHC <Gayle.Totton@nahc.ca.gov>
Sent: Wednesday, April 10, 2019 3:20 PM
To: thomasl@cityofgrassvalley.com
Subject: Dorsey Marketplace Project SCH# 2016022053

Good afternoon Mr. Last,

I have completed my review of the Draft EIR for the above referenced project. There is one small correction in the Most Likely Descendant (MLD) process as described under Alternative A (page 7-16) of the Cultural Resources section. The statements regarding the coroner's responsibilities are in error. The Coroner neither makes nor receives the recommendation concerning treatment and disposition (line 15 of that paragraph). They simply notify us of the find. We name a MLD who makes recommendation to the landowner. The Coroner also does not play a part in deciding who should be the MLD (line 16). That is the responsibility of the Native American Heritage Commission only.

I would greatly appreciate it if you could make these changes here, and if they appear anywhere else in the document as well.

If you have any questions, please let me know.

C-1

Sincerely,

Gayle Totton, M.A., Ph.D.
Associate Governmental Program Analyst
Native American Heritage Commission
(916) 373-3714

1

INTENTIONALLY LEFT BLANK

Response to Comment Letter C

NAHC
Gayle Totton
April 10, 2019

C-1 The comment provides correction regarding identification of the Most Likely Descendent (MLD) process in the event human remains are unearthed.

Revisions to the text describing the MLD process have been made as suggested to page 7-16 of Chapter 7, Cultural Resources. These edits are shown in Chapter 3, Draft EIR Text Revisions. The correction does not alter the Draft EIR analysis or conclusions regarding impact significance.

INTENTIONALLY LEFT BLANK

Comment Letter D

California Water Boards

Gavin Newsom, Governor
Jared Blumenfeld, Secretary for Environmental Protection

Central Valley Regional Water Quality Control Board

29 April 2019

Thomas Last
City of Grass Valley
125 East Main Street
Grass Valley, CA 95945

CERTIFIED MAIL
7017 2620 0001 1359 2004

COMMENTS TO REQUEST FOR REVIEW FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, DORSEY MARKETPLACE PROJECT, SCH#2016022053, NEVADA COUNTY

Pursuant to the State Clearinghouse's 22 March 2019 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Draft Environmental Impact Report* for the Dorsey Marketplace Project, located in Nevada County.

D-1

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

I. Regulatory Setting

Basin Plan

The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38.

D-2

The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically as required, using Basin Plan amendments. Once the Central Valley Water Board has adopted a Basin Plan amendment in noticed public hearings, it must be approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law (OAL) and in some cases, the United States Environmental Protection Agency (USEPA). Basin Plan amendments

Karl E. Longley ScD, P.E., chair | Patrick Pulupa, esq., executive officer
11020 Sun Center Drive #200, Rancho Cordova, CA 95670 | www.waterboards.ca.gov/centralvalley

only become effective after they have been approved by the OAL and in some cases, the USEPA. Every three (3) years, a review of the Basin Plan is completed that assesses the appropriateness of existing standards and evaluates and prioritizes Basin Planning issues.

For more information on the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins*, please visit our website:
http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

D-2 Cont.

Antidegradation Considerations

All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The Antidegradation Implementation Policy is available on page 74 at:
https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf

D-3

In part it states:

Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.

This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives.

D-4

The antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System and land discharge Waste Discharge Requirements (WDRs) permitting processes. The environmental review document should evaluate potential impacts to both surface and groundwater quality.

D-5

II. Permitting Requirements

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:

D-6

http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]
The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit
Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 2014-0057-DWQ.

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml

Clean Water Act Section 404 Permit
If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACE). If a Section 404 permit is required by the USACE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements.

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACE at (916) 557-5250.

D-6 Cont.

D-7

D-8

D-9

D-10

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Clean Water Act Section 401 Permit – Water Quality Certification
If an USACE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 10 of the Rivers and Harbors Act or Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications.

For more information on the Water Quality Certification, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/

D-11

Waste Discharge Requirements – Discharges to Waters of the State
If USACE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation.

For more information on the Waste Discharges to Surface Water NPDES Program and WDR processes, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_surface_water/

D-12

Dewatering Permit
If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Risk General Order) 2003-0003 or the Central Valley Water Board's Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Risk Waiver) R5-2013-0145. Small temporary construction dewatering projects are projects that discharge groundwater to land from excavation activities or dewatering of underground utility vaults. Dischargers seeking coverage under the General Order or Waiver must file a Notice of Intent with the Central Valley Water Board prior to beginning discharge.

For more information regarding the Low Risk General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf

For more information regarding the Low Risk Waiver and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2013-0145_res.pdf

D-13

Regulatory Compliance for Commercially Irrigated Agriculture
If the property will be used for commercial irrigated agricultural, the discharger will be required to obtain regulatory coverage under the Irrigated Lands Regulatory Program.

D-14

There are two options to comply:

1. **Obtain Coverage Under a Coalition Group.** Join the local Coalition Group that supports land owners with the implementation of the Irrigated Lands Regulatory Program. The Coalition Group conducts water quality monitoring and reporting to the Central Valley Water Board on behalf of its growers. The Coalition Groups charge an annual membership fee, which varies by Coalition Group. To find the Coalition Group in your area, visit the Central Valley Water Board's website at: https://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/regulatory_information/for_growers/coalition_groups/ or contact water board staff at (916) 464-4611 or via email at IrrLands@waterboards.ca.gov.

2. **Obtain Coverage Under the General Waste Discharge Requirements for Individual Growers, General Order R5-2013-0100**. Dischargers not participating in a third-party group (Coalition) are regulated individually. Depending on the specific site conditions, growers may be required to monitor runoff from their property, install monitoring wells, and submit a notice of intent, farm plan, and other action plans regarding their actions to comply with their General Order. Yearly costs would include State administrative fees (for example, annual fees for farm sizes from 11-100 acres are currently $1,277 + $8.53/Acre); the cost to prepare annual monitoring reports; and water quality monitoring costs. To enroll as an Individual Discharger under the Irrigated Lands Regulatory Program, call the Central Valley Water Board phone line at (916) 464-4611 or e-mail board staff at IrrLands@waterboards.ca.gov.

D-14 Cont.

Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Limited Threat Discharges to Surface Water* (Limited Threat General Order). A complete Notice of Intent must be submitted to the Central Valley Water Board to obtain coverage under the Limited Threat General Order.

D-15

For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016-0076-01.pdf

NPDES Permit

If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. A complete Report of Waste Discharge must be submitted with the Central Valley Water Board to obtain a NPDES Permit.

D-16

For more information regarding the NPDES Permit and the application process, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/help/permit/

If you have questions regarding these comments, please contact me at (916) 464-4812 or Jordan.Hensley@waterboards.ca.gov.

D-16 Cont.

Jordan Hensley
Environmental Scientist

cc: State Clearinghouse unit, Governor's Office of Planning and Research, Sacramento

Response to Comment Letter D

Central Valley Regional Water Quality Control Board
Jordan Hensley
May 2, 2019

D-1 The comment introduces the comment letter and the responsibilities of the Central Valley Regional Water Quality Control Board.

This comment does not address the adequacy or accuracy of the content of the Draft EIR or the project's environmental effects, and no response is required.

D-2 The comment outlines the role and requirements of the Basin Plan.

This comment does not address the adequacy or accuracy of the content of the Draft EIR or the project's environmental effects. The Basin Plan applicable to the project is the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins is discussed in Draft EIR Chapter 13, Hydrology and Water Quality, Regulatory Setting (section 13.2).

D-3 The comment provides a link to the State Water Board Antidegradation Policy and states that all wastewater discharges must comply with this policy.

The State Water Board Antidegradation Policy is discussed in Draft EIR Section 13.2; for clarification, text on page 13-7 has been revised to replace the word "nondegradation" with "antidegradation." The Draft EIR recognizes that the State Antidegradation Policy requires that disposal of wastes into state waters must not degrade water quality. In accordance with CEQA, all projects must be analyzed for compliance with all federal, state, and local policies and ordinances, which includes the State Water Board Antidegradation Policy. As required by the Antidegradation Policy, the potential impacts under Alternative A and Alternative B on surface water and groundwater quality were analyzed under Impact 13-1 in the Draft EIR. The contribution of Alternative A or Alternative B to cumulative violations of water quality standards and/or discharge requirements was evaluated under Impact 13-5 in the Draft EIR. In both cases, the EIR finds that with the use of Low-Impact Development (LID) techniques, Best Management Practices (BMPs), and complying with the National Pollutant Discharge Elimination System (NPDES) permit requirements, Alternative A or Alternative B would have a less-than-significant impact related to violating water quality standards or waste discharge requirements during construction and operation. Further review of the project's potential effects on water quality and identification of site-specific measures to avoid such effects would be completed at the time that the project applicant applies for an NPDES permit.

D-4 The comment quotes policy text describing the requirements of the Antidegradation Policy.

The quoted text is included in the Draft EIR on page 13-13. Please refer to Response to Comment D-3 regarding the evaluation of surface water and groundwater quality in the Draft EIR.

D-5 The comment states that antidegradation analysis is required in the NPDES and Waste Discharge Requirements permitting processes and that the environmental review should evaluate potential impacts to surface and groundwater.

As discussed in Response to Comment D-3, evaluation of the project's potential effects to surface water and groundwater quality is presented in Draft EIR Impact 13-1.

D-6 The comment describes the requirements of a Construction Storm Water General Permit and identifies a website with more information.

Background information on the General Permit for Storm Water Discharges and the Construction General Permit is provided in Draft EIR Section 13.2, Regulatory Setting, under the heading NPDES Stormwater Discharge Permits. The project's requirements to apply for coverage under the permit and prepare and implement a stormwater pollution prevention plan (SWPPP) are discussed under Draft EIR Impact 13-1. This impact analysis also describes some of the specific BMP and LID measures incorporated in the project plans.

D-7 This comment describes the BMP and LID requirements of the Phase I and Phase II Municipal Separate Storm Sewer System (MS4) Permits.

Information on MS4 permits is included in the Draft EIR in Section 13.2, Regulatory Setting, under the heading NPDES Stormwater Discharge Permits. The project's requirements to comply with the NPDES Stormwater Discharge permit, including the provisions of the MS4 permit, are discussed under Draft EIR Impact 13-1.

D-8 The comment lists links to websites that provide additional information on Phase I and Phase II MS4s.

Refer to Response to Comment D-7 regarding the MS4 permits.

D-9 The comment states that storm water discharges associated with industrial sites must meet the requirements of the Industrial Storm Water General Permit and identifies a website with more information.

The project is not an industrial site and, therefore, is not subject to these requirements.

D-10 The comment describes the purpose and requirements of a Clean Water Act Section 404 Permit and identifies a website that provides more information. The comment also notes that realignment of surface water drainage may require a Streambed Alteration Agreement from the California Department of Fish and Wildlife.

As shown in Table ES-1 on page ES-8 of the Draft EIR and discussed in Draft EIR Section 2.7, Entitlements and Approvals, and Draft EIR Impact 6-3, Alternative A or Alternative B would require a Clean Water Act Section 404 Permit. Specifically, it is expected that a Section 404 Nationwide Permit would be required because the project, under either Alternative A or Alternative B, would impact less than one-half acre of waters of the U.S. Draft EIR Section 2.7 also states that a Streambed Alteration Agreement would be required; this necessary approval has been added to Table ES-1 as shown in Chapter 3, Draft EIR Text Revisions.

Section 404 permits are discussed in the Draft EIR under the Regulatory Setting subheading (Sections 6.2 and 13.2) in both Chapter 6, Biological Resources, and Chapter 13, Hydrology and Water Quality. The need for this permit is discussed in more detail in the Biological Resources section under Impact 6-3 in Section 6.3. The EIR concludes that impacts to riparian habitat and waters of the United States would be less than significant with implementation of Mitigation Measure 6f, which requires the project applicant to obtain a Section 404 permit and to provide replacement and/or compensation for the loss of wetlands. Text has been added to Impact 13-1 referencing the regulatory permit requirements for impacts to waters of the US and waters of the state, as shown in Chapter 3, Draft EIR Text Revisions.

D-11 The comment describes the purpose and requirements of a Clean Water Act Section 401 Permit and provides links to a website with more information.

As shown in Table ES-1 on page ES-8 of the Draft EIR and discussed in Draft EIR Section 2.7, Entitlements and Approvals, the project would require a Section 401 Water Quality Certification. Clean Water Act Section 401 permits are discussed under the Regulatory Setting subheading (Sections 6.2 and 13.2) in both Chapter 6, Biological Resources, and Chapter 13, Hydrology and Water Quality. Text regarding the potential impacts to waters of the United States and waters of the state, and the requirement for a Clean Water Act Section 401 permit has been added to Impact 6-3, as shown in Chapter 3, Draft EIR Text Revisions.

D-12 The comment outlines the requirements of the Waste Discharge Requirement Permit and identifies a website that provides more information.

As discussed in the Biological Technical Report (Draft EIR Appendix E) and in text added to Chapter 6 the project site contains approximately 0.077 acres of drainages and 0.065 acres of wetlands and waters of the United States. Two of the drainage features do not fall under federal or state regulation. However, the 0.011-acre intermittent drainage and the 0.065-acre seasonal wetland are both considered to be within the jurisdiction of the Army Corps of Engineers and the Regional Water Quality Control Board. Additionally, the intermittent drainage is considered to be within the jurisdiction of the California department of Fish and Wildlife (CDFW). As shown in Chapter 3, Draft EIR Text Revisions, text on pages 6-8 and 6-9 and in Impact 6-3 and Impact 13-1 has been added to clarify the jurisdictional status of the intermittent drainage and seasonal wetland. Under either alternative, the project applicant would be required to obtain a Waste Discharge Requirement permit to authorize impacts to these features, as identified in Draft EIR Impact 6-3, Section 13.2, and Impact 13-1.

D-13 The comment outlines the requirements of the Dewatering Permit and provides links to websites with more information.

Neither Alternative A nor Alternative B includes any dewatering activities, and the project would not be required to obtain coverage for such activities. Construction assumptions are provided in Section 2.4 and 2.5, Project Description, of the Draft EIR.

D-14 The comment outlines the regulatory compliance requirements for commercially irrigated agriculture and the two options for compliance.

There are no existing irrigated agricultural activities on site, and the land uses proposed for the project site do not include agriculture. Therefore, neither Alternative A nor Alternative B is required to obtain coverage under the Irrigated Lands Regulatory Program. Proposed land uses on the project site are summarized in Section 2.4 and 2.5, Project Description, and are evaluated in more detail in Draft EIR Chapter 3, Land Use under Impact 3-1.

D-15 The comment outlines the requirements of the Limited Threat General NPDES Permit and identifies a website with more information.

Neither Alternative A nor Alternative B includes any construction dewatering activities or discharges of groundwater to waters of the US, and the project would not be required to obtain coverage for such activities. Construction assumptions are provided in Section 2.4 and 2.5, Project Description, of the Draft EIR.

D-16 The comment outlines the requirements of the NPDES Permit and provides a link to a website with more information.

As stated in Response to Comment D-6, the Draft EIR includes information on the General Permit for Storm Water Discharges and the Construction General Permit, the project's requirements to apply for coverage under the permit and prepare and implement a SWPPP, and some of the specific BMP and LID measures incorporated in the project plans to comply with the NPDES requirements.

Comment Letter E

COUNTY OF NEVADA
COMMUNITY DEVELOPMENT AGENCY
DEPARTMENT OF PUBLIC WORKS
950 MAIDU AVENUE, NEVADA CITY, CA 95959-8617
(530) 265-1411 FAX (530) 265-9849 www.mynevadacounty.com

Sean Powers
Community Development Agency Director

Trisha Tillotson
Director of Public Works

May 2, 2019

Attn: Tom Last
City of Grass Valley
Community Development Department
125 E. Main Street
Grass Valley, CA 95945

Re: Dorsey Marketplace Project Draft EIR

Dear Mr. Last:

Thank you for the opportunity to comment on the Draft EIR for the Dorsey Marketplace Project. The Transit Services Division of the Nevada County Public Works Department has the following conditions of approval for the Project:

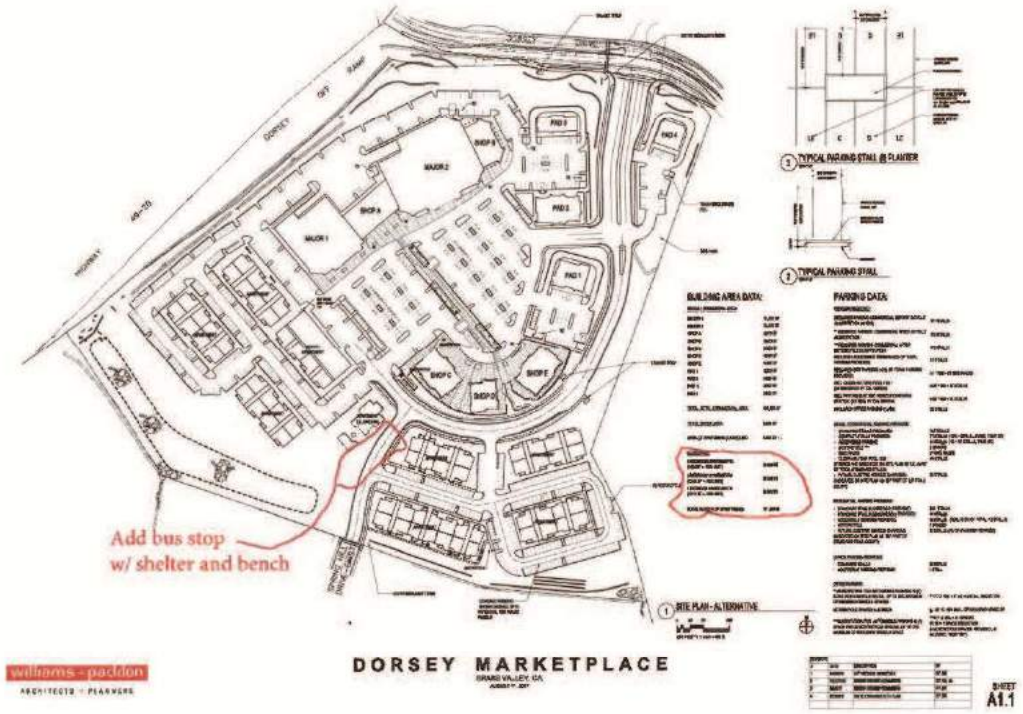
1. Bus Pullout Design: For Alternatives A and B, bus stop pullouts shall be designed to accommodate a 35-foot transit bus and must be built compliant with US Access Board 810.2.2 and 810.3 specifications. E-1

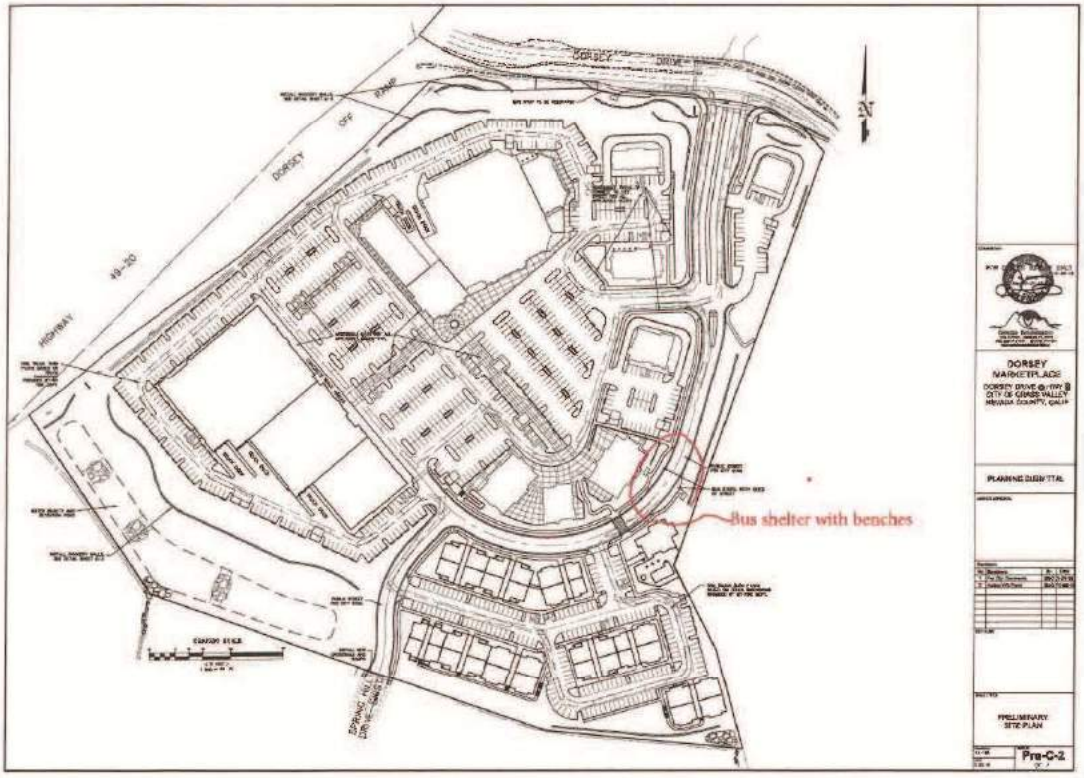
2. Bus Pullout Locations: For Alternatives A and B, the proposed bus stop pullout locations are acceptable. Construction shall include the installation of ADA compliant bus shelters consistent with the architectural design of the development. For Alternative B plans, an additional bus stop pullout shall be placed on the west side of Springhill Drive near its intersection with the Marketplace Road and adjacent to the proposed Apartment Clubhouse (see attached plan markup). The addition of 171 apartment units warrants a co-located transit stop to facilitate use of alternative transportation. E-2

If you have any questions, please contact me at (530) 265-1411 or Trisha.Tillotson@co.nevada.ca.us.

Sincerely,

TRISHA TILLOTSON, P.E.
Director of Public Works


Add bus stop
w/ shelter and bench
DORSEY MARKETPLACE
williams - pedlon
A1.1


DORSEY
DRIVE
DORSEY
OFF
RAMP
49-20
HIGHWAY
Bus shelter with benches
DORSEY
MARKETPLACE
PLANNING SUBMITTAL
PRELIMINARY
SITE PLAN
Pre-C-2

INTENTIONALLY LEFT BLANK

Response to Comment Letter E

Nevada County Department of Public Works
Trisha Tillotson
May 2, 2019

E-1 The comment indicates appreciation for the opportunity to comment and states that the Nevada County Department of Public Works will require that in both Alternative A and B, the bus pull out must accommodate a 35-foot transit bus and be compliant with US access board 810.2.2 and 810.3.

The proposed project will comply with all local, state and federal laws, policies, and regulations regarding transit stops, including US access board 810.2.2 and 810.3. As shown on Figure 2-4, Alternative A Site Plan and Figure 2-5, Alternative B Site Plan, both Alternatives would provide sufficient space at the proposed transit stop in order to accommodate a 35-foot transit bus and would provide benches as indicated in the figure on the third page of the comment letter.

E-2 The comment states that the current bus pullout locations are acceptable, states that construction shall include bus shelters that comply with the Americans with Disabilities Act, and recommends an additional bus stop under Alternative B on the west side of Springhill Drive near the Marketplace Road intersection.

The proposed project will comply with all local, state and federal laws, policies, and regulations regarding bus stops, including Americans with Disabilities Act design requirements.

The project includes two transit stop locations – one along the project site frontage on Dorsey Drive and a second southeast of the proposed pad labeled Shop E in the site plans for each alternative. The City does not agree that an additional bus stop is warranted under Alternative B. The proposed bus stop is within approximately one-fourth mile of all proposed dwelling units, which is considered to be a reasonable walking distance. The suggested location for this additional bus stop is less than 400 feet from the proposed stop and would not substantially reduce the walking distance for residents in the southwestern portion of the project site. Additionally, multiple crosswalks would be required to provide appropriate access to the suggested additional bus stop location. As stated in Draft EIR Impact 8-6 and the Traffic Impacts Analysis Report, either Alternative A or Alternative B would generate a moderate increase in transit ridership demand. Provision of the transit stop along Dorsey Drive and an additional single bus stop interior to the project site is expected to be sufficient to accommodate the project-generated transit ridership demand.

INTENTIONALLY LEFT BLANK

Comment Letter F

NEVADA IRRIGATION DISTRICT
1036 W. Main Street, Grass Valley, CA 95945-5424
(530) 273-6185 ~ Fax: (530) 477-2646 ~ www.nidwater.com

May 1, 2019

City of Grass Valley Public Works Department
Thomas Last, Community Development Director
125 E. Main Street
Grass Valley, CA 95945

Re: Comments Regarding the Notice of Completion (NOC) of the Draft Environmental Impact Report (EIR) for the Dorsey Marketplace Project

Dear Mr. Last:

The Nevada Irrigation District (District) appreciates the opportunity to comment on the Draft EIR for the Dorsey Marketplace Project. As a responsible public agency, the District has an interest in ensuring our role and background are portrayed accurately. . F-1

In response to the Dorsey Drive Marketplace Draft EIR, the District has the following concerns:

- Page 13-14 – The first sentence of the last paragraph incorrectly states: "Domestic water service to the project site and surrounding residential development is provided by the City of Grass Valley". In fact, the District is the domestic water service provider in the surrounding area. F-2
- Page 14-2 Paragraph 1 and 2 - both paragraphs make a reference to the number of District's water treatment plants. Paragraph 1 describes the District as having eight treatment plants, while paragraph 2 describes the District as having seven. Due to recent system changes and consolidation, the current number is six water treatment plants. F-3
- Page 14-3 Last paragraph and Table 14-2 - The description provided for Table 14-2 is "NID projected Increase in Water Demand". The description does not provide adequate detail to inform the reader that this is the anticipated future demand for water service to the City of Grass Valley only. The numbers in the table are not District wide anticipated demands. F-4
- Page 14-28 Paragraph 1 – The second sentence states: "As detailed in the NID UWMP, NID has sufficient water supplies to meet the anticipated future water demands in normal, single dry year, and multiple dry year conditions". This is not the case. The District's UWMP Table 6-5 shows the District anticipates a shortfall in water supply during a dry year scenario by the year 2035. Nevertheless, the District's UWMP anticipated growth and increased demands based upon the City's planning documents. This approach means proposed future water demands from developments such as the Dorsey Marketplace were included in the Districts UWMP as anticipated growth. F-5

- Page 14-28 Paragraph 1 – The sixth sentence states: "Therefore NID is anticipated to have more than sufficient water to meet the needs of its customers, and this project, through 2040." In normal water years that remains true. However, as stated above, the District anticipates a shortfall of supply in dry years by the year 2035.

F-6

- Page 14-28 Paragraph 2 – The second sentence states: "Water use in the Nevada Irrigation District has declined more than 20% between 2013 and 2017 (Southern California Public Radio 2017)". In reality, the District has experienced an 18% reduction in domestic water use from 2013 through 2018. It is important to note that this reduction in use is only domestic and does not include irrigation water demands.

Please contact me at (530) 273-6185 ext. 282 or via email at close@nidwater.com if you have any questions or would like additional information.

F-7

Sincerely,

Armon "Chip" Close
Water Operations Manager

Response to Comment Letter F

Nevada Irrigation District
Armon "Chip" Close
May 1, 2019

F-1 The comment provides introductory remarks.

The comment does not address the project's environmental effects or the accuracy or adequacy of the EIR; no response is required.

F-2 The comment identifies a correction to text on page 13-14, stating that Nevada Irrigation District (NID) is the domestic water service provider in the project area.

As shown in Chapter 3, Draft EIR Text Revisions, edits have been made in Chapter 13 Hydrology and Water Quality to reflect the recommended correction. Due to other edits made to this chapter, the text now appears on page 13-15. Similar revisions were also made on page 14-1 of Chapter 14 Public Services and Utilities. These corrections do not alter the analysis of project impacts.

F-3 The comment identifies corrections to text on page 14-2 stating that NID currently operates six water treatment plants.

Text edits have been made to page 14-2 to reflect the recommended corrections, as shown in Chapter 3, Draft EIR Text Revisions. The corrections do not alter the analysis of project impacts.

F-4 The comment states that the data shown in Table 14-2, NID Projected Increase in Water Demand, is specific to water demand within the City of Grass Valley only and does not represent district-wide anticipated water demand.

The district-wide anticipated water demand is identified in Table 14-1. Table 14-2 and associated text have been revised to identify the district-wide water supply and demand in single dry and multiple dry water years, as shown in Chapter 3, Draft EIR Text Revisions.

F-5 The comment identifies corrections to text on page 14-28, stating that NID expects water supply shortfalls in 2035 and 2040 under the single dry and multiple dry water year conditions. The comment notes that the Urban Water Management Plan (UWMP) water demand projections include anticipated growth within the service area, such as the proposed project.

Due to edits made to earlier in Draft EIR Chapter 14 Public Services and Utilities, the text referenced in this comment now appears on page 14-29. Text revisions have been made to pages 14-29 through 14-31 to reflect the anticipated water supply shortfall in single dry and multiple dry water year conditions, as shown in Chapter 3, Draft EIR Text Revisions. The text stating that there would be no significant cumulative impact to which the project could contribute has been revised to recognize that there is a potentially significant impact in the cumulative scenario. The added text also demonstrates that the proposed project would not make a substantial contribution to this cumulative impact, and thus the EIR correctly concludes

that the project's impacts would be less than significant. This is because a portion of the project's water demand is already assumed in the UWMP demand projections, the residential water demand rate is not specific to multi-family residential and thus is likely to overestimate the actual water demand from the project, the projected demand does not assume water conservation reductions that would be integrated in the project through Mitigation Measure 11a, and the projected demand for the project and for NID overall does not reflect the additional conservation that typically occurs through public outreach and education in dry years, which would reduce the degree to which a water shortage may occur.

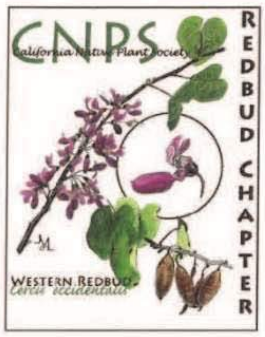
F-6 The comment identifies corrections to page 14-28, stating that NID expects a water supply shortfall in single dry year and multiple dry year conditions by 2035. The comment reiterates that the UWMP water demand projections include anticipated growth within the service area.

As discussed in Response to Comment F-5, text revisions have been made to the discussion of Impact 14-2 to reflect that there is a potentially significant impact in the cumulative condition. However, the proposed project would not make a substantial contribution to that impact, thus the project's impact remains less than significant. The revised text is shown in Chapter 3, Draft EIR Text Revisions.

F-7 The comment identifies a text correction to page 14-28, stating that NID has experienced an 18% reduction in domestic water use from 2013 to 2018.

Due to edits made earlier in Draft EIR Chapter 14 Public Services and Utilities, the text referenced in this comment now appears on page 14-29. Text edits have been made to page 14-29 to reflect the recommended correction. Similar text edits were also made on page 14-2. The correction does not alter the impact analysis or conclusions. The revised text is shown in Chapter 3, Draft EIR Text Revisions.

Comment Letter G



California Native Plant Society

The mission of the California Native Plant Society is to increase understanding and appreciation of California's native plants and to preserve them in their natural habitat through scientific activities, education, horticulture, and conservation.

Thomas Last, Community Development Director
City of Grass Valley
125 East Main Street
Grass Valley, CA 95945

April 28, 2019

Dear Mr. Last:

We are writing on behalf of Redbud Chapter of the California Native Plant Society (CNPS) which serves members in Nevada and Placer Counties. CNPS is a statewide non-profit organization dedicated to the preservation of native plants and their habitats.

The following are comments from Redbud-CNPS about the EIR for Dorsey Marketplace Development Project.

Rare Plants

It appears as though information in the EIR is taken verbatim from the Biological Technical Report. Unfortunately, this Biological Technical Report is invalid because it is a hybrid of information for this project and information related to a completely different project in another location altogether. Significant portions of this report were apparently taken verbatim from a Technical Report prepared for a different project not even located within Nevada County. Note that the photos are not from the Dorsey development site, the plant list has species that do not occur in this region, and the scoping list is not appropriate or correct for this region/site. We believe that the findings from this report summarized in the EIR are clearly insufficient based on the invalid source document. We are also concerned that no mitigations were proposed in the likely event that rare plants are found. We would like to know with whom you will be consulting, and consideration should be given to the unique natural history characteristics of each species when mitigations are determined.

G-1

G-2

G-3

P.O. Box 2662, Nevada City, CA 95959 www.redbud-cnps.org

According to the information in the EIR, "No floristic surveys" were conducted, just reconnaissance level surveys. There is a mitigation to do pre-implementation surveys, and we are concerned that there will be no public review to ensure that surveys were conducted during the appropriate time for potential species and that sufficient mitigations are in place for any rare plants that are located. It is the policy of CNPS that all potential, direct, indirect and cumulative impacts to rare, threatened, or endangered plants and habitats are assessed using CA Dept. of Fish and Wildlife's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. Surveys must occur during bloom periods of rare plants. Appropriate measures should be implemented to prevent impacts resulting from projects. It is also the policy of CNPS that environmental documents be based on complete, accurate, and current scientific information.

G-4

The site contains ultrabasic soils classified as gabbro (Dubakella and Secca complex) and contain a unique plant community (McNab cypress) with the potential for several rare or uncommon plants. We find that the EIR does not sufficiently address cumulative impacts to this habitat type, nor does the mitigation of replanting sufficiently reduce the effects level
The proposed impact on gabbro soils and associated plant communities should be considered, and quantified, relative to declining habitat within Nevada County and their necessity for the protection and/or reintroduction of rare gabbro soil plants. The U.S. Fish and Wildlife Service recognized this plant community in its Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills, 2002. The proposed impact on gabbro soils and associated plant communities should be considered, and quantified, relative to declining habitat within Nevada County and their necessity for the protection and/or reintroduction of rare gabbro soil plants. CA Dept. of Fish and Wildlife is currently requesting Federal Endangered Species Act Section 6 Grant funding to manage, maintain, and restore similar rare plants and habitats that have been impacted within Nevada County.

G-5

Redbud-CNPS has identified the potential for additional rare plant species that were not addressed in the EIR. A full re-scoping should be conducted for any additional species:
Allium sanbornii var. *sanbornii*, Sanborn's Onion, CRPR 4
Brodiaea sierrae, Sierra Brodiaea, CRPR 4
Carex cyrtostachya, Sierra arching sedge, CRPR 1B.2
Carex xerophila, Chaparral sedge, CRPR 1B.2
Chlorogalum grandiflorum, red hills soaproot, CRPR 1B.2
Fremontedendron decumbens, Pine Hill flannelbush, Federally Endangered
Fritillaria eastwoodiae, Butte County fritillary, CRPR 3.2
Perideridia bacigalupii, Mother Lode Yampah, CRPR 4
Plagiobothrys glyptocarpus, Cedar Crest popcornflower, CRPR 3
Juncus digitatus, Finger Rush, CRPR 1B.1

G-6

Redbud would appreciate being able to review the surveys once complete and request that a qualified botanist be used for surveys.

P.O. Box 2662, Nevada City, CA 95959 www.redbud-cnps.org

Rare Plant Community

In addition, the EIR does not address the potential for success of transplanting McNab cypress, nor does it reference any studies that point to the success of this strategy. There should be a full consideration of the efficacy of this mitigation *before* pronouncing it will reduce impacts to a level below significance. G-7

The EIR does not sufficiently address cumulative impacts to rare vegetation and plants due to increases in non-native invasive plants. Annual grasses and yellow star thistle are known from the site and are likely to increase and spread into adjacent wildlands with ground disturbance and threatening plant communities. Invasive weeds are known to outcompete native species and could have adverse impacts on the rare vegetation community and any rare plants present. G-8

Open Space

We would be very supportive if the open space component of this project conserved the rare vegetation, and would support finding a way to protect it in the long term. Redbud-CNPS is very likely to support the management of proclaimed open space in the project proposal by the Bear Yuba Land Trust, for its protection in perpetuity. G-9

Before mitigation measures are fully acceptable, new biological analysis should be conducted and updated EIR should be written, to ensure that there is an accurately assessment of the botanical resources at risk.

We appreciate the opportunity to comment. G-10

Sincerely,

Wendy Boes
Co-Chair for Conservation, Redbud Chapter
California Native Plant Society

And

Jeanne M. Wilson
President, Redbud Chapter – California Native Plant Society
P.O. Box 2662, Nevada City, CA 95959
president@redbud-cnps.org

INTENTIONALLY LEFT BLANK

Response to Comment Letter G

California Native Plant Society
Wendy Boes and Jeanne M. Wilson
April 28, 2019

G-1 This comment provides introductory remarks identifying the Redbud Chapter of the California Native Plant Society (CNPS).

The comment does not address the accuracy or adequacy of the EIR or the project's environmental effects; no response is required.

G-2 The comment states that the information in the Draft EIR was taken verbatim from the Biological Technical Report, which contains information related to a different project in a location outside of Nevada County. Additionally, the comment states that the plant list and the scoping list is not correct for the project site.

The Biological Technical Report was prepared specific to the project site. The vegetation mapping correctly identifies the project site and the vegetation communities within the project site. The report appendices, which include the site photographs, lists of plants and animals observed at the project site, and the scoping list of special-status plants and animals known to occur in the region, were incorrect due to an error made during report production. The correct appendices have been posted to the City's website and are included with this Final EIR.

G-3 The comment states concern that there are no mitigation measures identified in the event that rare plants are found onsite. The comment states that the CNPS would like to know with whom the City would consult if rare plants are found onsite, and notes that determining appropriate mitigation should include consideration of the unique natural history of the project site.

The Draft EIR includes Mitigation Measure 6a, as acknowledged in comment G-4, to address the potential for special-status plants to occur onsite. Thus the comment is not correct that the EIR lacks a mitigation measure that would address potential impacts to rare plants. Specifically, Mitigation Measure 6a states that surveys must be conducted by a qualified biologist during "a time when special-status plants are evident and identifiable."

Text edits have been made in the Biological Technical Report and Draft EIR Chapter 6 to clarify the potential for special status plant species to occur onsite. The text revisions are shown in Chapter 3 of this Final EIR. The revisions include noting that preparation of the Biological Technical Report included a site visit in July 2016 and refining Mitigation Measure 6a to provide more clarity regarding survey timing, survey protocols, and potential consultation requirements.

The project site was surveyed for the presence of special-status plants during preparation of the Draft EIR, and none were identified onsite. The original site survey was conducted in March 2016, which is a time of year during which the special status plants with potential to occur onsite would not be identifiable. A second site survey was conducted in July 2016, which is a period during which many of the special status plants with potential to occur onsite would have

been present and identifiable. Thus appropriate and industry-standard methods were used to identify the potential presence of special-status plants as part of the environmental review. However, due to the amount of time that will pass between these site surveys and project construction, it is necessary for the survey to be repeated. Thus Mitigation Measure 6a specifies that protocol-level rare plant surveys shall be performed prior to construction and when potentially occurring special-status plant species are evident and identifiable. Per survey guidelines and protocol issued by the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and CNPS, the surveys will be floristic in nature and will identify all species to a taxonomic level sufficient to determine rarity. Mitigation Measure 6a has been updated to reflect these requirements, as shown in Chapter 3, Draft EIR Text Revisions. Mitigation Measure 6a also states that the City must consult with CDFW and/or USFWS if federally-listed or state-listed plants are observed onsite, and obtain concurrence from the applicable agency for any avoidance, minimization, and mitigation measures. However, it is important to note that unless a plant is State or federally listed as Rare, Threatened, or endangered, prior approval from USFWS or CDFW is not required. Completion of the plant survey and avoidance and compensatory actions required under Mitigation Measure 6a would ensure that impacts to special status plant species are reduced to a less than significant level.

In summary, the Biological Technical Report and Draft EIR contain sufficient evidence and analysis to demonstrate that it is unlikely that special-status plants would occur onsite; the Biological Technical Report and Draft EIR also contain adequate mitigation to ensure that presence or absence of special-status plants would be confirmed before construction begins, and appropriate measures taken to reduce impacts to any such plant species. Specifically Mitigation Measure 6a requires additional surveys to be conducted at appropriate times for identification of special status plant species, requires consultation with appropriate regulatory bodies, identifies a specific performance standard of ensuring the continued presence of plant species in the project region, and identifies the "type(s) of potential action(s) that can feasibly achieve that performance standard and that will considered, analyzed, and potentially incorporated in the mitigation measure." With these characteristics, the measure provides mitigation for the potential effects to special-status plant species consistent with the requirements of CEQA Guidelines Section 15126.4(B).

G-4 The comment states that the EIR relies upon reconnaissance level surveys rather than floristic surveys and that the pre-implementation surveys required by mitigation measures would not be publicly reviewed for accuracy and the sufficiency of specific mitigation actions. The comment states that it is the policy of the CNPS that plant surveys should meet the standards set by the CDFW, surveys must occur during the blooming periods of rare plants, appropriate measures should be implemented to prevent impacts resulting from projects, and that environmental documents should be based on complete, accurate, and current scientific information.

As discussed in Response to Comment G-3, site surveys were conducted in March and July 2016. The July survey occurred during the blooming period of the special-status plants that have potential to occur at the project site. Further, these surveys were floristic in nature. As stated on Draft EIR page 6-6, "All plant species encountered during the field survey were

identified to the lowest taxonomic group possible and recorded directly into a field notebook." Mitigation Measure 6a requires an additional survey to be conducted prior to project construction, and specifies that this survey must be conducted by a qualified biologist when special-status plants are identifiable. CEQA does not require that impacts be prevented if feasible and effective mitigation is implemented to reduce and/or compensate for those impacts such that the impacts would be reduced to a less than significant level. Specifically, CEQA Guidelines Section 15370 provides that mitigation may include minimizing, rectifying, reducing, or compensating for an impact, in addition to avoiding an impact. Additionally, Mitigation Measure 6a has been amended, as shown in Chapter 3, Draft EIR Text Revisions. The amendments to this measure include defining the survey protocols that must be followed.

There is no requirement for the results of the site surveys to be subject to public review. However, the surveys would be part of the City's project file, which is available for public review. Thus CNPS or other interested parties would have the ability to access the survey reports.

G-5 The comment states that the project site contains ultrabasic soils (gabbro), supports a unique plant community (McNab cypress), and could support several rare plant species. The comment states that the EIR does not adequately consider cumulative impacts to the gabbro soils and associated plant communities, and that these impacts should be considered and quantified within the context of the declines in this habitat throughout Nevada County. Finally, the comment states that CDFW is requesting Endangered Species Act Section 6 grant funding to maintain, manage, and restore similar rare plant and habitats within Nevada County.

The Draft EIR recognizes that the site contains gabbro soils (for example, on pages 6-2 and 6-3 and the reference to serpentine soil substrates on page 6-7) and the McNab cypress vegetation community (e.g., page 6-3), and recognizes the potential for the site to support rare plants (pages 6-5 through 6-7 and in Impact 6-1). The Draft EIR describes the McNab cypress woodland on pages 6-3 and 6-4; and states on page 6-17 "since suitable habitat for special-status plant species exists on the project site there is potential that these species may be present."

The project site is an already isolated patch of the McNab cypress vegetation community. Based on review of aerial photographs, it appears that the McNab cypress community would have extended to the east and southeast, but these areas are now urbanized with light industrial, commercial, and residential land uses. Thus development of the project site would not result in further habitat fragmentation. The Draft EIR analysis of potential cumulative impacts relies on the analysis provided in the Grass Valley General Plan EIR, which "found that potential cumulative impacts related to loss of habitat, particularly for sensitive species, loss of wetlands, and adverse effects on movement and dispersal of wildlife and wildlife migration corridors would all be reduced to less than significant levels through compliance with the General Plan and City ordinances." Specific to the McNab cypress vegetation community, Mitigation Measure 6e requires the project applicant to provide "compensatory habitat conservation and/or restoration" sufficient to offset the project's impacts to this community. Thus the project's contribution to any potential cumulative impacts would remain less than significant.

G-6 The comment lists plant species that the comment asserts should have been addressed in the EIR.

The Draft EIR states on page 6-6 that the determination of which special-status plants have potential to occur onsite was based on review of the CDFW's California Natural Diversity Database (CNDDB), the CNPS Inventory of Rare and Endangered Plants, the USFWS lists of federal endangered and threatened species, other information sources, and the physical characteristics of the project site, including the soil types and vegetation communities present. As shown in the Biological Technical Report and stated on Draft EIR page 6-6, Dudek's biologist determined that of the 11 special-status plant species that have potential to occur in the project vicinity, four species have no potential to occur onsite because of a lack of suitable habitat or the project site is outside of the species' known range and four other species have low potential to occur on the project site due to lack of appropriate soil substrates or habitats on site. The Biological Technical Report and Draft EIR conclude that three special-status plant species have moderate potential to occur at the project site. This comment does not provide evidence or analysis demonstrating that these conclusions are erroneous.

As stated in Response to Comment G-2, the correct appendices to the Biological Technical Report have been posted to the City's website and are included with this Final EIR. As shown in Appendix C to the Biological Technical Report, the following three species listed in this comment were determined to have low or no potential to occur onsite:

Chlorogalum grandiflorum, red hills soaproot - **Low potential to occur.** This species is known predominantly from the Pine Hill Ecological Reserve. However, the serpentine soils onsite may provide suitable habitat for this species

Fremontodendron decumbens, Pine Hill flannelbush - **Not expected to occur.** While the chaparral onsite provide potentially suitable habitat for this species, it was not observed during the July site surveys, which were conducted when this species would be evident and identifiable. The nearest documented occurrences of this species were documented in 2009 approximately 0.5 mile south of the project site (CDFW 2019). According to the notes in the occurrence data, this record may contain hybrid flannelbushes and further study is needed (CDFW 2019).

Juncus digitatus, Finger Rush **Low potential to occur.** Although the seasonal pond onsite may provide potential habitat for this species, this habitat was dominated by non-native vegetation and no plants in the genus *Juncus* were noted in this habitat during the site visit.

Regarding the other species listed in this comment, only one, *Carex xerophila,* is considered a special status species because it is ranked by the CNPS as Rank 1, which indicates that the species is in jeopardy of becoming endangered or extinct in the project region. However this plant was not ranked at the time that the environmental analysis began for this project with publication of the Notice of Preparation (NOP) for the EIR in February 2016. As noted in Response to Comment B-3, CEQA Guidelines Section 15125(a)(1) states that generally a lead agency should consider the baseline condition as that which exists at the time the NOP is prepared. Thus the conditions that existed in 2016 are considered to constitute the baseline

from which the project's impacts are measured and it was not required that the Draft EIR address the *Carex xerophila* species because it was not ranked by the CNPS as Rank 1 at that time.

Nonetheless, if the Draft EIR had considered the project's potential effects on the *Carex xerophila* species, this would not change the impact analysis or mitigation measure recommendations presented in the Draft EIR because this species is considered to have a low potential to occur within the project site. This is because although the chaparral and coniferous forest onsite provide potentially suitable habitat for this species, the nearest documented occurrence of this species was last observed in 2014 along the roadside of Highway 20 approximately 3 miles southwest of the project site (CDFW 2019). This species forms dense clumps of vegetation that are notable even when the plant is not in bloom. Chaparral sedge was not identified onsite during the site surveys, which were conducted when this species would be evident and identifiable.

The comment identifies six additional plant species with the suggestion that these species should also be considered in the Draft EIR analysis of potential loss of special stats plant species. However, each is designated as either Rank 3 or Rank 4 by the CNPS, and these species do not meet the CEQA definition of a special-status plant or the City of Grass Valley General Plan definition of special-status plants. Thus it is not necessary for the EIR to evaluate potential impacts to these species. However, if these species were considered in the Draft EIR, this would not change the impact analysis or mitigation measure recommendations presented in the Draft EIR because these species are considered to have no potential or a low potential to occur within the project site as noted below

Allium sanbornii var *sanbornii*, Sanborn's Onion. **Low potential to occur.** Chaparral and coniferous forest habitat onsite provide potentially suitable habitat for this species, although serpentine outcrops and gravelly openings preferred by this species were limited. This species has been previously documented in 2005 approximately 0.4 miles east of the project site (CCH 2019); however, no species in the genus *Allium* were observed in these habitats during the July site surveys, which were conducted when Sanborn's onion would be evident and identifiable.

Brodiaea sierra, Sierra Brodiaea. **Low potential to occur.** Chaparral and coniferous forest onsite provide potentially suitable habitat for this species, although open areas were limited and dry meadows preferred by this species were not present. The most recently documented occurrence of this species in the Grass Valley area is a historic, 1905 record (CCH 2019). This species was not observed during the July site surveys, which were conducted when it would be evident and identifiable.

Carex cyrtostachya, Sierra arching sedge. **No potential to occur**. Although there is marginally suitable habitat adjacent to the seasonal pond onsite, mesic areas, riparian forest, meadows and seeps, and other perennially wet areas are not present. This species has not been previously documented within Nevada County (CCH 2019; CDFW 2019). Furthermore, this species was not observed during the July site surveys, which were conducted when this species would be evident and identifiable.

Fritillaria eastwoodiae, Butte County fritillary. **Low potential to occur**. Chaparral and coniferous forest onsite provide potentially suitable habitat for this species. The nearest previously documented occurrence of this species was last updated in 2002 in Plumas National Forest, approximately 5 miles northwest of the project site (CDFW 2019). Butte County fritillary was not observed during the March sit survey, which was conducted when this species would be evident and identifiable.

Perideridia bacigalupii, Mother Lode Yampah. **Low potential to occur**. Chaparral and coniferous forest onsite provide potentially suitable habitat for this species. The nearest documented occurrence of this species was observed in 1963 approximately 2 miles northeast of the project site (CCH 2019). This species was not observed during the July site surveys, which were conducted when Mother Lode yampah would be evident and identifiable.

Plagiobothrys glyptocarpus var. *modestus*, Cedar Crest popcornflower. **Low potential to occur**. The coniferous forest onsite provides potentially suitable habitat for this species; however, there are no seeps or mesic openings in the forest onsite. The nearest documented occurrence for this species was documented in the 1930's approximately 3 miles northeast of the project site (CCH 2019). Although the site surveys were conducted outside the period when this species would be evident and identifiable, no species in the genus *Plagiobothrys* were noted during the surveys. Thus, it is unlikely this species occurs on the project site.

G-7 The comment states that the EIR does not address the potential success of transplanting the McNab cypress woodland and that the EIR should consider the efficacy of this mitigation before determining that it would reduce the impact to a less than significant level.

The EIR does not recommend transplanting the McNab cypress woodland. Rather, Mitigation Measure 6e requires the project applicant to provide "compensatory habitat conservation and/or restoration." Thus it is not necessary to evaluate the efficacy of transplanting this vegetation community.

G-8 The comment states that the EIR does not sufficiently address cumulative impacts to rare plants and vegetation due to increases in non-native invasive plants, especially star-thistle and annual grasses which are known to spread following ground disturbances.

The proposed project would remove the majority of existing vegetation within the project site and areas that are not paved would be landscaped and maintained. Thus disturbance of the project site would not contribute to the spread of non-native invasive plants. Further, the project site is already isolated patch of habitat already surrounded by light industrial, urban, and residential development. There are no natural areas adjacent to the site to which invasive plants could spread.

G-9 The comment states that CNPS would be supportive of rare plant conservation within the open space component of the project as well as the management of such open space by the Bear Yuba Land Trust for protection into perpetuity.

Mitigation Measure 6a requires that if special-status plant species are found, the City must consult with the CDFW and/or the USFWS, "depending on the status of the species, to establish

a plan to ensure the continued presence of these species in the project region." Mitigation Measure 6e requires compensation and/or restoration of McNab cypress woodland and cottonwood forest communities, which can be accomplished in a variety of ways, including through conservation easements. Mitigation Measure 6e provides for several mechanisms to avoid, reduce, or compensate for impacts to sensitive vegetation communities. This allows for the project design to be modified to provide greater reduction of on-site impacts and limited on-site habitat restoration if feasible. It also allows for conservation of McNab cypress that may occur in off-site locations. Under both of these mitigation measures, the established performance standards could be satisfied through rare plant conservation within open space areas as suggested in this comment, or other areas as identified through the City's consultation with the CDFW and/or the USFWS, and management of such open space areas by the Bear Yuba Land Trust would be consistent with the mitigation requirements.

G-10 The comment states that a new biological analysis should be conducted and the EIR updated before the mitigation measures are acceptable. The comment provides conclusory statements.

Responses to Comments G-2 through G-9 address the CNPS' specific comments regarding the Biological Technical Report and the mitigation measures presented in the Draft EIR. These responses demonstrate that the Biological Technical Report was prepared in accordance with industry standards and CEQA requirements and that the revisions to the Biological Technical Report and its appendices are available for review at the City's website and as part of this Final EIR. Thus there is no need to complete a new biological analysis and the impact analysis, conclusions, and mitigation measures presented in the EIR (including the revisions included in this Final EIR) are sufficient and meet CEQA requirements.

References Cited

California Consortium of Herbaria (CCH). 2019. Data provided by the participants of the Consortium of California Herbaria (ucjeps.berkeley.edu/consortium/; July 2019)

California Department of Fish and Wildlife (CDFW). 2019. California Natural Diversity Database (CNDDB) – Version v5.77.14. https://map.dfg.ca.gov/rarefind/view/RareFind.aspx.

INTENTIONALLY LEFT BLANK

Comment Letter H

Greater Grass Valley Chamber of Commerce

Serving Our Community For Over 100 years

April 26, 2019

Mr. Tom Last, Development Director
City of Grass Valley Community Development Department
125 East Main Street
Grass Valley, CA 95945

RE: Dorsey Marketplace Draft EIR

Dear Mr. Last,

On behalf of the Greater Grass Valley Chamber of Commerce, it is our pleasure to write a letter in support of the Dorsey Marketplace Draft EIR.

We have read and discussed the Draft EIR, attended the April 16th Planning Commission's Informational Workshop on the Draft EIR, listening to the Draft EIR presentation and public's comments. We agree with the Applicant that it was prudent to withdraw the project from consideration and taking time to reevaluate the project in terms of current economic trends, to accomplish additional environmental studies, and community needs before resubmission for consideration.

In terms of approval, we feel that the Draft EIR satisfies the CEQA Guidelines and has mitigation measures in place to address the areas of known controversy and issues raised by the community. In addition, it is consistent with the City of Grass Valley's plans for the Core Priority Development Areas and its Economic Strategic Plan.

The Chamber is very much in favor of the proposed Plan Amendment B with the increased housing element, reconsidered architectural design, and the attention to elements that promote the quality of life for future residents and the community at large.

Sincerely,

Joy Porter
Chair of the Board, Greater Grass Valley Chamber of Commerce

Robin Galvan-Davies,
CEO Greater Grass Valley Chamber of Commerce

128 East Main Street • Grass Valley, CA 95945 • (530) 273-4667 • www.grassvalleychamber.com

Champions of the Chamber

Intero Real Estate Services

Nevada County Gold

Waste Management

Partners of the Chamber

Atria Senior Living

Beam "Easy Living" Center

Friends of the Chamber

Bank of the West

Cirinos at Main Street

City of Grass Valley

Eskaton

Gold Miners Inn

Grande Wood Design

Habitat for Humanity ReStore

Jennco Web Works

Mertens Insurance Agency

Mike Bratton State Farm

Network Real Estate

Nevada County Arts Council

Plaza Tire & Auto Service

Sierra Nevada Destination Services

Sierra Theaters

Stanford Mortgage

The Union

H-1

INTENTIONALLY LEFT BLANK

Response to Comment Letter H

Grass Valley Chamber of Commerce
Joy Porter and Robin Galvan-Davies
April 26, 2019

H-1 The comment expresses support for the proposed project and states that the Chamber of Commerce feels that the Draft EIR satisfies the CEQA Guidelines and includes mitigation measures that address concerns raised by the community.

The comment does not identify any deficiencies in the Draft EIR analysis of the project's environmental effects and required mitigation. No response is required.

INTENTIONALLY LEFT BLANK

Comment Letter I

Greater Grass Valley Chamber of Commerce

Serving Our Community For Over 100 years

April 26, 2019

Mr. Tom Last, Development Director
City of Grass Valley Community Development Department
125 East Main Street
Grass Valley, CA 95945

Dear Mr. Last,

On behalf of the Community Affairs Committee led by the Greater Grass Valley Chamber of Commerce, it is my pleasure to write a letter of support of the Dorsey Marketplace Draft EIR

On April 17th, the Applicant's representative, Warren Hughes made a presentation to our Committee, recapping the highlights of the April 16th Planning Commission's Informational Workshop, as well as an overview of the Draft EIR presentation, CEQA Guidelines, and mitigation measures in place to address the areas of known controversy and issues affecting the community.

The housing crisis in Western Nevada County has been a continued focus of the Community Affairs Committee. Those attending today's meeting agree that the Applicant's Amended Plan B, featuring 171 rental units will partially mitigate that crisis.

Those in attendance at the April 17th meeting in agreement to support the Draft EIR:

Jon Katis, KNCO, Board Director GGVCC, Chair, Community Affairs Committee
Michael Anderson, CEO Clientworks, Advocacy Chair, Nevada County Tech Connection
Kathleen Schaffer, Community Member
Jay Strauss, Winton Strauss Law Group
Jonathan Walker, Appreciated Real Estate Company
Robin Galvan-Davies, CEO Greater Grass Valley Chamber of Commerce

In Attendance; not voting
Dan Miller, Nevada County Supervisor, District 3
David Morgan, Field Representative, Congressman Doug LaMalfa
Hilary Hodge, City of Grass Valley City Council Liaison to the Grass Valley Chamber

Sincerely,

Jon Katis,
Chair, Community Affairs Committee

Robin Galvan-Davies,
CEO Greater Grass Valley Chamber of Commerce

128 East Main Street • Grass Valley, CA 95945 • (530) 273-4667 • www.grassvalleychamber.com

Champions of the Chamber

Intero Real Estate Services
Nevada County Gold
Waste Management

Partners of the Chamber

Atria Senior Living
Beam "Easy Living" Center

Friends of the Chamber

Bank of the West
Cirinos at Main Street
City of Grass Valley
Eskaton
Gold Miners Inn
Grande Wood Design
Habitat for Humanity ReStore
Jennco Web Works
Mertens Insurance Agency
Mike Bratton State Farm
Network Real Estate
Nevada County Arts Council
Plaza Tire & Auto Service
Sierra Nevada Destination Services
Sierra Theaters
Stanford Mortgage
The Union

I-1

INTENTIONALLY LEFT BLANK

Response to Comment Letter I

Grass Valley Chamber of Commerce – Community Affairs Committee
Jon Katis and Robin Galvan-Davies
April 26, 2019

I-1 The comment states that the housing crisis in Western Nevada County has been a focus of the Grass Valley Chamber of Commerce - Community Affairs Committee and that the committee feels that proposed Alternative B would help address that crisis.

The comment does not address the accuracy or adequacy of the Draft EIR or the potential adverse environmental effects of the proposed project. No response is required.

INTENTIONALLY LEFT BLANK

Comment Letter J

Protect CEQA
California Environmental Quality Act

May 6, 2019

Via Email to: toml@cityofgrassvalley.com
Via FAX to: (530) 274-4399

Thomas Last
Community Development Director
125 E Main Street
Grass Valley, CA 95945

RE: Comment to Draft Environmental Impact Report ("DEIR") SCH-#2016022053

This letter is being submitted to provide preliminary comments on the draft environmental impact report ("DEIR") prepared for the Dorsey Marketplace project ("the Project"). The site of the Project is the abandoned Spring Hill Mine ("the Site").

Thank you for taking the time to conduct a full study of the Project and the Project Site via an environmental impact review. It is important that large-scale projects with significant potential to impact the land uses and built and physical environment of a community be afforded full study. That said, we feel it is important to raise a number of areas where review should be better focused or more expansive to ensure that decision makers and the public have a more full and adequate understanding of the potential impacts of the Project.

J-1

General Plan and Land Use Conflicts

A necessary element of the plan includes an amendment to the General Plan coincident with a rezoning and other relevant entitlements for the Project.

It's well established in California that the General Plan is the "constitution" for future development in a community. Therefore it is disfavored to amend the General Plan to accommodate a specific proposed project simply to accommodate that project, especially where the EIR approved during the general plan approval process contemplates an entirely different use.

That is the case here. The EIR approved for General Plan 2020 ("the General Plan") contemplated that the Project Site be used for a Business Park, and it was therefore zoned accordingly (i.e., Corporate Business Park). A General Plan has to be considered as a complete whole rather than evaluated in discrete parts, because each part of the General Plan operates with each other part; the entire purpose of the General Plan is to make sure that there is a holistic and comprehensive plan for an entire community.

The amendment to the General Plan to accommodate this property raises potential conflicts and undermines portions of the General Plan, which threaten the consistency of the General Plan as a document in total.

For example, General Plan Policy 1-RP requires projects to provide pedestrian pathways and ease of pedestrian access; the purpose of the policy is to ensure that projects encourage pedestrian circulation and safety and are part of general pedestrian

J-2

J-3

circulation. The DEIR however finds no inconsistency or potentially inconsistency, and fails to address the potential issues for pedestrian safety (see below) raised in comments to the Notice of Preparation (NOP).

There is also a potential inconsistency with the General Plan's policy regarding noise impacts as well. The General Plan requires that noise study include a twenty-year horizon. This is found in Table 6-7, page 6-16 of the General Plan. Is it unclear from the documentation within the DEIR itself whether this requirement has been met; it may be a function of what is and is not included in the DEIR, but the "noise summary" appendix is a single page with little more information (found in Appendix H, "Noise Summary"). The Noise Summary is in general fairly sparse, and it is unclear where the details of the noise impact analysis is to be found, even in the more thorough treatment of noise impacts in the dedicated section on Noise Impacts in the DEIR itself (i.e., starting at section 9-1). Note that this requirement is aimed towards project applicants, not the general plan's overall noise element, or at least presumably so, given that the first bulletpoint in this table is that noise studies should be the financial responsibility of "the applicant."

J-3 Cont.

J-4

Noise Impacts from Unique Sources

The DEIR also fails to consider unique sources of noise, i.e., sources that are specific to the proposed Project. Because specific end-uses of the Project are still unknown, the DEIR should include potential noise impacts from particular uses that could arise by-right as a result of entitlements ultimately granted. Should this DEIR be

J-5

adopted, then its contents will be relied on in making the final judgments on entitlements. If no study has been conducted of the various kinds of uses that could arise by-right, the DEIR will fail as an appropriate informational document for purposes of CEQA.

For example, the Project's commercial element could include particular retail or commercial uses that result in high-impact noises. This includes outdoor dining/entertainment, high-frequency truck deliveries (including the back-up beeper noises), steel gates and docks being used in early-morning hours, truck braking, and other noises that are unique or specific to uses that are associated with uses that are permitted by right in the proposed rezoning (C-2 and R-3).

As a result, the mitigation measures are too speculative, in terms of man-made attenuation mitigations. For certain types of noise sources, a sound wall or similar barrier may be necessary to prevent decibel emissions exceeding acceptable levels to be properly attenuated. This can lead to a cascade of speculative or incomplete information, since the size, materials, and location of structures necessary for appropriate attenuation. This in turn means that potential aesthetic impacts cannot be properly evaluated either.

At a minimum, the DEIR should include a series of analyses of potential noise sources that are unique to the array of by-right uses permitted in the proposed zoning designation (i.e., C-2).

J-5 Cont.

J-6

Traffic/Transportation/Pedestrian Safety

As raised in a comment submitted to the NOP, there are existing serious pedestrian access and safety concerns for the residents who live in the immediate vicinity of the Project Site. (Appendix A). These concerns require particular attention because the Project itself will be attractive for more pedestrian access (given the potential specific uses that can or will arise after the Project is entitled).

Specifically, a number of local residents regularly travel by foot or bicycle to move about and conduct business in the vicinity of the Project Site. This will likely increase as a result of development of the Project, and therefore pedestrian safety, particularly for residents with disabilities and without regular access to automobiles, needs to be specifically considered and addressed by the DEIR. Failure to study pedestrian circulation and impacts on pedestrian safety is a deficiency of the DEIR; pedestrian circulation is a part of the relevant analysis for traffic impacts because of the interaction with traffic patterns.

As it stands the DEIR lacks a comprehensive evaluation on the existing patterns of pedestrian circulation. The lack of specificity in terms of the ultimate specific commercial uses of the site no doubt contributes to this deficiency. If the Project ultimately contains "staples" retail uses--household goods, convenience stores, groceries, etc.--then the impacts resulting from pedestrian traffic and access are unique. Pedestrians crossing into the site can cause traffic queuing, interfere with vehicle circulation in terms of traffic, and also result in more accidents on the Site, which has implications for the use of public safety resources (also an element of environmental impact review).

J-7

Beyond the basic public policy concern with ensuring that pedestrian access be adequately studied (not generally simply accounted for by putting down sidewalks), a thorough count of pedestrian activity in the vicinity of the Project Site, and a realistic count of pedestrian trips and access to the site *based on either the actual or by-right uses* that will arise as a result of approval and entitlement of the Project is necessary because of the potential impact on actual vehicular traffic in the vicinity of the site, in the accessing of the site, and in terms of the internal circulation of the site. J-8

A Range of Uses Should be Studied to Avoid Indefinite Results

As with the potential unique noises analysis, the traffic analysis suffers from the indefinite nature of the Project. While alternatives A and B consider a range of square footage with a range of potential commercial uses, the indefinite nature of the actual uses (i.e., the specific character of each use) and the actual number of establishments makes the traffic impact analysis ("TIA") too speculative and leaves the DEIR as insufficient as an information document. J-9

The TIA considers the potential traffic impact from types of uses and infers counts from square footage; but the lack of sufficient information in terms of the identity of specific uses, leaves too much to speculate about. For example, high-intensity commercial uses (such as discount retailers, grocers, and convenience stores/pharmacies) are unique retail uses that create unique traffic patterns, both in terms of trip generation and internal circulation.

While CEQA does not require that tenants be identified, a project-specific EIR that is meant to provide environmental review sufficient to allow for local entitlements J-10

that would result in by-right construction, at a minimum the variety of uses and definite orientation and type of structures and establishments should be identified. Failure to do so means approving an EIR, and thereby avoiding studying environmental review, for impacts that are otherwise *foreseeable*. Failure to do renders the DEIR insufficient as an information document.

J-10 Cont.

Thank you for your time and attention to this matter.

Best Regards,

Andrew Grundman
Executive Director
Protect CEQA
(916) 273-4811
ag@grundmanlaw.com

c/o Grundman Law
3807 Pasadena Ave.
Ste. 120
Sacramento, CA 95821

Protect CEQA is a California nonprofit unincorporated association comprised of a statewide coalition of environmentalists, labor members, and concerned residents committed to protecting the California Environmental Quality Act (CEQA) and to promoting smart growth development since 2014.

INTENTIONALLY LEFT BLANK

Response to Comment Letter J

Protect CEQA
Andrew Grundman
May 6, 2019

J-1 The comment provides introductory remarks, noting that there are a number of areas where the Draft EIR analysis should be better focused or more expansive to provide a full understanding of the project's potential effects.

The comment does not identify any specific deficiencies in the EIR or concerns about specific environmental effects. All of the issues raised in subsequent comments are addressed in the following responses. No additional response to this comment is required.

J-2 The comment states that the General Plan 2020 should be evaluated as a whole rather than discrete parts. The comment states that the proposed amendment to the General Plan raises additional potential conflicts and undermines other portions of the General Plan thereby threatening consistency with the document as a whole.

Draft EIR Chapter 3, Land Use and Planning provides an analysis of the project's potential to be inconsistent with the General Plan, considering the whole of the General Plan and reflecting the General Plan policies identified in the regulatory framework sections of each of the environmental impact analysis chapters (Chapters 3 through 15). Impact 3-1 finds that the proposed project would require implementation of mitigation measures to ensure consistency with several policies, concluding that both Alternative A and Alternative B would have less than significant impacts with mitigation. A more detailed consistency analysis is provided in Draft EIR Appendix C.

The comment is correct that the project proposes to change General Plan land use designation for the project site. The General Plan EIR was prepared at a programmatic level of analysis and does not provide detailed analysis of site-specific developments, thus it did not, as suggested in the comment "contemplate an entirely different use" for the project site, other than in accounting for the planned business park use of the site in the General Plan buildout projections and assumptions that underlie the impact analysis, particularly for resources such as noise, air quality, public and utility services, and traffic. While the proposed change in land use at the project site would result in changed demands for service, traffic generation rates and patterns, and other operational characteristics (all of which are evaluated in detail in the Dorsey Marketplace EIR), these changes would not substantially alter anticipated environmental conditions throughout the City at buildout of the General Plan. Thus the project would not undermine the General Plan as a "holistic and comprehensive plan for [the] entire community."

The comment does not identify specific content of the General Plan with which the project would conflict. As shown in Table 1-1 of the Grass Valley General Plan, the incorporated City limits at the time the General Plan was prepared included 2,521 acres and the General Plan planning area included an additional 7,373 acres of unincorporated County land. Changing the designation of the 26.8-acre Dorsey Marketplace project site from Business Park to a

mixture of Commercial and Urban High Density would not substantially change overall buildout of the City and implementation of the General Plan. Further, the proposed residential and commercial development on this infill site is consistent with the General Plan discussion under the heading "Future Development within Present City Limits," on page 2-3. In this section the General Plan recognizes the importance of infill development to "facilitate efficient use of land with a minimum of public service extensions" and that "it is realistic to expect infill development to accommodate about one-third of new housing in the Planning Area, including the City, in the next 20 years. Depending on market factors, infill may be able to provide a larger percentage of non-residential development, but by no means will it be able to meet the total commercial and industrial land demand."

The EIR points out several ways in which the project meets some characteristics of the Business Park designation. For example, on page 3-14, the EIR notes that the project would reflect some of the "campus setting" attributes noted in the City's Development Code for the Corporate Business Park zone district, specifically "by providing cohesive architecture, vehicle and pedestrian circulation, uniform sign and lighting standards, and maintenance of a landscape theme."

J-3 The comment cites General Plan Policy 1-RP and states that it addresses pedestrian pathways and access. The comment asserts that the purpose of that policy is to ensure that projects encourage pedestrian circulation and safety. The comment states that the Draft EIR does not find the project inconsistent with this policy and that the EIR fails to address concerns about pedestrian safety raised in comments on the Notice of Preparation (NOP) for this EIR.

Pedestrian safety is discussed in Impact 8-5 of Chapter 8, Transportation. Both alternatives would maintain the existing pedestrian facilities along the project site frontage. On-site pedestrian facilities included in both alternatives consist of continuous sidewalks, crosswalks, accessible paths of travel, pedestrian crossings through the parking lots, patios in front of the major and minor shop pads, extension of existing Dorsey Drive sidewalks, and extension of existing Spring Hill Drive sidewalks. Bicycle parking and bus stops are also proposed.

The project's consistency with General Plan Policy 1-RP is discussed in Appendix C: General Plan Consistency. This comment mischaracterizes the language and purpose of Policy 1-RP. As shown in Appendix C, Policy 1-RP states: "Provide parks and open spaces of different sizes and types to respond to the needs of a diverse population, including trails for pedestrian and equestrian use, bicycle pathways, linear parkways and park-like natural areas." As can be seen when considering the full text of this policy, the focus is not on pedestrian pathways and access generally. Instead the primary intent of the policy is to ensure that sufficient parks, open space, and trails are provided. The EIR finds the project consistent with this policy as evaluated in Chapter 14 because the project would be required to pay parkland dedication and park facilities fees at the time that building permits are issued.

J-4 The comment states that the project may be inconsistent with General Plan policies regarding noise impacts because the General Plan requires that a noise study include a 20-year horizon and it is not clear whether the Draft EIR noise impact analysis meets this requirement. The

comment notes that the Noise Summary provided in Appendix H consists of a single page that does not provide substantial details.

The comment is correct that the General Plan requires that noise studies consider cumulative noise levels. General Plan Table 6-7 lists the requirements for noise studies, and indicates that cumulative noise levels should be considered at a 20-year horizon. The noise analysis presented in the Draft EIR documents noise levels for the following conditions, as shown in Table 9-12: existing, existing plus project, cumulative (labeled as "future"), and cumulative plus project. The cumulative noise levels are based on the cumulative traffic volumes projections provided in the traffic study, which is based on projected traffic in the year 2035. The NOP for this EIR was published in February 2016, thus the cumulative horizon is 19 years in the future. This is generally consistent with the General Plan requirements and with industry-standard methodologies.

The comment is not correct that EIR Appendix H contains a single sheet of data. As shown at the City's webpage for the project (Grass Valley 2019), Appendix H includes nine separate files that provide data used in the noise impact analysis for project construction, which was completed using the Roadway Construction Noise Model (RCNM). The details of the noise analysis that was completed based on this data are presented in Draft EIR Chapter 9, Noise.

J-5 The comment states the Draft EIR fails to consider unique sources of noise that are specific to the proposed project, such as specific types of retail or commercial uses and activities (like truck deliveries, dock, truck breaking).

The noise analysis relies upon the typical industry-standard approach for evaluating a proposed development project. Noise sources associated with the proposed commercial land uses are evaluated in Impact 9-2. Specifically, the discussion under the heading "Operational On-Site Impacts" on pages 9-16 and 9-17 addresses the exposure of the proposed residential uses to truck delivery and mechanical equipment noise. Additionally, the potential for outdoor dining is reflected on the site plans and was considered during preparation of the noise impact analysis. However no significant impacts are anticipated to occur as a result of outdoor dining due to the typical noise levels associated with outdoor dining areas as well as the distance and topographic changes between residential uses (both proposed and existing) and the proposed outdoor patio areas in the commercial portion of the project.

The Draft EIR concludes that there is a potential for residential uses to be exposed to unacceptable noise levels due to project operation. To address this impact, the EIR requires implementation of Mitigation Measure 9b to provide a more detailed and precise analysis of potential noise levels and ensure that any unacceptable noise levels are reduced through the selection of low sound generating mechanical equipment, use of screen walls or roof parapet, restriction of delivery schedules, and noise barriers.

Because the mitigation measure requires attainment of a specific performance standard of ensuring that interior noise levels for residential uses meet the General Plan standards, and identifies the "type(s) of potential action(s) that can feasibly achieve that performance standard and that will considered, analyzed, and potentially incorporated in the mitigation

measure" this measure provides sufficient mitigation for the potential residential noise exposure, as defined by CEQA Guidelines Section 15126.4(B).

J-6 The comment states that the Draft EIR noise mitigation measures are too speculative. It notes that for certain noise sources, a sound wall or other barrier may be needed, which can lead to aesthetic impacts. The comment states that the Draft EIR should include a series of analyses of potential noise sources that are unique to the array of by-right uses permitted in the C-2 zone district.

The noise analysis relies upon the typical industry-standard approach for evaluating a proposed development project. Detailed construction plans have not yet been prepared for the site and the project applicant has not identified any specific businesses that would locate at the site, thus the specific details of noise sources that might be present at the site are not known. Rather, the noise analysis relies on typical noise levels associated with commercial land uses. CEQA Guidelines Section 15151 states that the "evaluation of the environmental effects need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible." The EIR is adequate because it provides detailed analysis of the known and typical noise sources but does not engage in speculation over those characteristics of project operation that cannot be known at this time. Further the EIR includes detailed mitigation measures based upon clear performance standards to ensure that noise impacts are adequately mitigated at the time that the additional operational details become available.

The reference to noise barriers in Mitigation Measure 9b would include barriers constructed around mechanical equipment, which are typically slightly higher than the equipment itself. Thus the barriers are not expected to be full height walls. Further the mechanical equipment associated with commercial uses would primarily be interior to the project site and noise barriers around these noise sources would not be visible from offsite locations. Thus the requirement to provide noise barriers is not expected to create adverse impacts to aesthetics.

The range of uses permitted by-right in the C-2 zone include a variety of retail, commercial, office, and residential uses, as shown in the Grass Valley Municipal Code Section 17.24.030 and Table 2-10. The noise generation characteristics of the range of permitted uses do not vary substantially. Other than outdoor patios for restaurants and cafes, all of the permitted land uses in this zone would occur indoors and thus the noise generation of the uses is predominantly a factor of the traffic that the use would generate, which is reflected in the noise analysis presented in Chapter 9. As noted in Response to Comment J-5, no significant impacts are anticipated to occur as a result of outdoor dining due to the typical noise levels associated with outdoor dining areas as well as the distance and topographic changes between residential uses (both proposed and existing) and the proposed outdoor patio areas in the commercial portion of the project.

J-7 The comment states that there are existing pedestrian access and safety concerns and that because the project could attract more pedestrian and bicycle activity, pedestrian safety should be addressed in the EIR, particularly in relation to the interaction between pedestrian activity and vehicle traffic patterns. The comment states that the lack of certainty about the specific commercial businesses that may locate within the project leads to uncertainty about the

volume of pedestrian activity. The comment also states that pedestrians crossing into the site can cause traffic queuing, interfere with vehicle circulation, and result in more accidents within the project site.

The comment is correct that one of the comment letters received in response to the Notice of Preparation for this EIR identified concerns with existing safety deficiencies for pedestrians. However, the comment (submitted by Shera Banbury) specifically addresses vehicle and pedestrian traffic along Main Street and pedestrian traffic between Sierra College and the Brunswick Basin shopping centers. These concerns are not relevant to pedestrian activity in the immediate vicinity of the project site.

As noted on page 12 of the Traffic Impact Assessment Report (TIAR, Draft EIR Appendix G), the calculation of intersection level of service (LOS) includes appropriate time for pedestrian crossings based on Caltrans standards as well as the actual volume of "pedestrian calls" (which is when a pedestrian pushes the signal button to trigger the pedestrian crosswalk cycle). The AM and PM peak hour traffic counts that were conducted in 2016 specifically included pedestrian and bicycle counts on Dorsey Drive in the vicinity of the project driveway location, shown below as Exhibit 1 and Exhibit 2. There were fewer than five pedestrians and/or bicyclist during the AM and PM peak hours. Thus degree to which the existing level of pedestrian activity affects vehicle traffic is reflected in the traffic impacts analysis.

Exhibit 1 – AM Peak Hour Bicycle/Pedestrian Counts, Dorsey Drive at Project Entrance

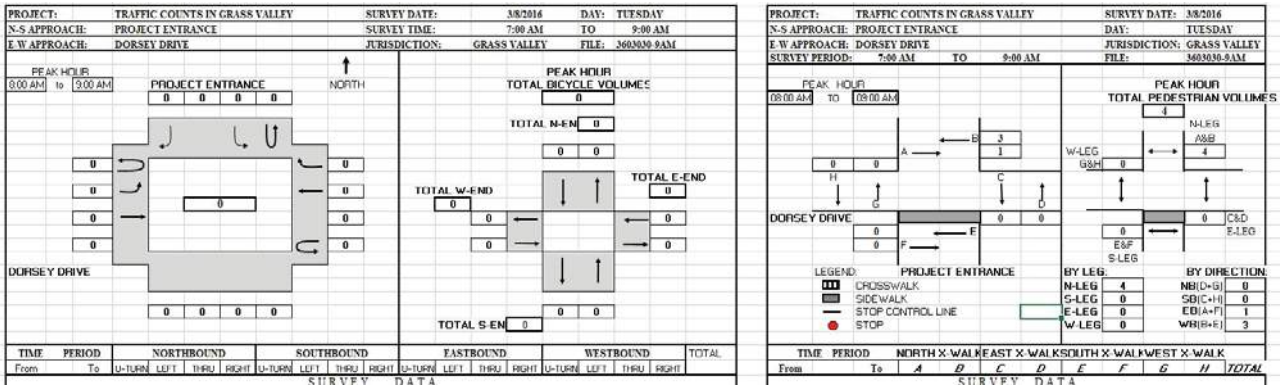
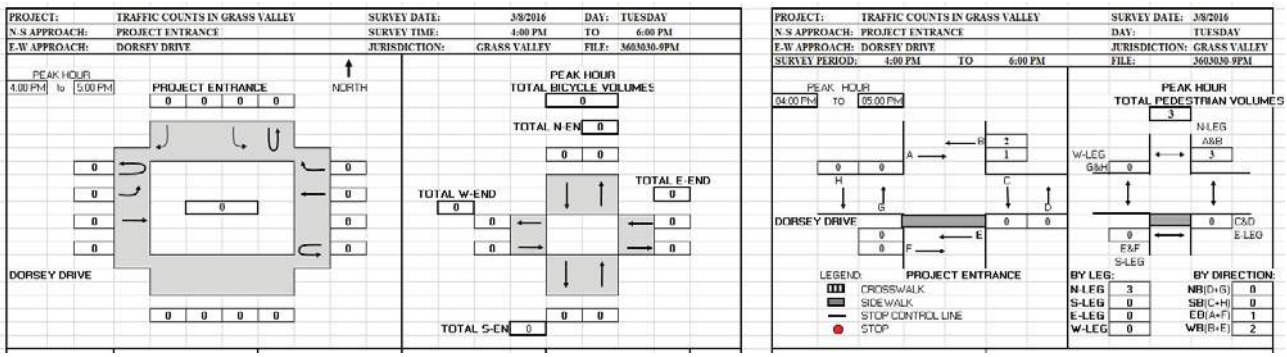


Exhibit 2 – PM Peak Hour Bicycle/Pedestrian Counts, Dorsey Drive at Project Entrance



Further, the project is consistent with the following recommendations from the TIAR to support non-motorized transportation:

- Off-Site
    - All off-site roadway improvements on Spring Hill Drive and Dorsey Drive will be designed to accommodate bicycle traffic consistent with the City and County adopted plans. Only minimal improvements are anticipated for the existing Class II bike facility on southerly Dorsey Drive.
    - Maintain the pedestrian facilities along the project frontage.
- On-Site
    - Implement the City's development standards to satisfy on-site transportation needs of pedestrians and cyclists
    - Install bike racks at store fronts

Additionally, the project driveway would include a traffic signal with a crosswalk across Dorsey Drive. This would facilitate a safer north-south access for non-motorized travel for residents on the north side of Dorsey Drive.

As noted on Draft EIR page 8-3, there are continuous sidewalks on both sides of Dorsey Drive and there are marked crosswalks across both the northbound and southbound SR 20/49 ramps. Thus there is adequate provision for pedestrian safety between the project site and Sierra College. Additionally, the proposed circulation plan complies with all city, state, and federal design and accessibility standards. Thus the design of the on-site vehicle and pedestrian circulation facilities and parking lot would not create substantial hazards for pedestrians.

The comment is correct that the specific tenants of the commercial spaces within the project site may influence the total number of pedestrians accessing the site. The modeling and analysis provides a reasonable estimate of vehicle traffic based on the observed trip generation rates at three nearby shopping centers that are reflective of the range of uses allowed within a shopping center and typical to the project region.

J-8 The comment states that the Draft EIR should include counts of existing pedestrian activity in the vicinity of the site and projections of pedestrian trips based the actual or by-right land uses that would be allowed within the proposed project.

Refer to response to Comment J-8 regarding the TIAR and Draft EIR analysis related to pedestrian and bicycle activity. Currently, the site is undeveloped and does not support any pedestrian or other non-motorized transportation facilities. Existing pedestrian activity adjacent to the project site is limited to use of the sidewalks along Dorsey Drive and Spring Hill Drive. The proposed project includes continuous sidewalks, crosswalks, accessible paths of travel, extension of existing Dorsey Drive sidewalks, and extension of existing Spring Hill Drive sidewalks. These would comply with all city, state, and federal design and accessibility standards. This includes providing sufficient sight distance at all pedestrian crossing points to minimize the potential for vehicle-pedestrian conflicts.

The analysis of potential pedestrian and bicycle safety impacts was based on an industry-standard approach. CEQA Guidelines Section 15151 states that the “evaluation of the

environmental effects need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible." Additionally, CEQA Guidelines Section 15204 states that "CEQA does not require a lead agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commenters." Thus tabulation of potential pedestrian trips associated with each specific land use allowed within the proposed General Plan and zoning designations is not necessary.

J-9 The comment states that the traffic analysis is too speculative because the actual uses of the site and actual number of establishments are unknown and it makes the Draft EIR insufficient as an informative document. The comment gives the example of the different traffic patterns (trip generation and internal circulation) that would result from high-intensity commercial uses.

The traffic modeling and analysis provides a reasonable estimate of vehicle traffic based on the observed trip generation rates at three nearby shopping centers that are reflective of the range of uses allowed within a shopping center and typical to the project region. In order to calculate trip generation for the proposed project's retail and commercial component, peak hour counts were performed on March 2, 2016 at three local shopping centers with similar uses to the proposed project. The three local shopping centers include the K-Mart shopping center, the Raley's shopping center and the Grocery outlet shopping center. As is typical in shopping centers, there is a range of specific retail uses present in each of the three local shopping centers, with some retail uses that tend to generate higher traffic volumes and some that tend to generate lower traffic volumes. It is reasonable to expect that the proposed shopping center would also carry a similar mixture of retail uses and associated ranges of trip generation rates. The three local shopping centers' peak hour traffic was averaged to derive peak hour trip rates that were then applied to the project square footage. These three shopping centers cover the entire breadth of the uses noted in the comment and as such account for the range of traffic patterns expected to occur from a wide variety of retail uses.

In addition, the observed trip generation rates were compared with the trip generation rate published by the Institute of Transportation Engineers to confirm their validity. The three local shopping centers were shown to generate more traffic compared to the published average rates and equations in the Institute of Transportation Engineers' (ITE) Trip Generation Manual 9th Edition, which ensure the TIAR and Draft EIR present a conservative analysis. Shopping centers typically develop with a range of uses, and a range of traffic intensity associated with those uses. It would be speculative and unreasonable to assume that a new shopping center would consist entirely of the highest trip-generating uses. The approach used in the traffic modeling and analysis is consistent with industry-standard methodologies for evaluating the effects of new non-residential land uses.

J-10 The comment states that while CEQA does not require tenants be identified, the EIR is meant to provide sufficient environmental review that would allow for local entitlements. The comment states that the variety of uses and definite orientation and type of structures and establishments should be identified. The comment states that failing to identify these characteristics means that the EIR would fail to identify all of the project's foreseeable impacts and this would render the Draft EIR insufficient as an informational document.

The comment is correct that CEQA does not require future tenants of the proposed commercial uses to be specified. The range of uses permitted by-right in the C-2 zone include a variety of retail, commercial, office, and residential uses, as shown in the Grass Valley Municipal Code Section 17.24.030 and Table 2-10 and as discussed in Draft EIR Chapter 2, Project Description, and Chapter 3, Land Use. Thus the variety of uses that may be supported at the project site is well-defined.

As discussed in Responses to Comments J-5 and J-7, the analyses of transportation and noise impacts rely upon the typical industry-standard approach for evaluating a proposed development project. Specifically, the transportation analysis is based on observed conditions at three local shopping centers that include similar tenants to those anticipated to occupy the Dorsey Marketplace project. The transportation and noise impacts analyses reflect a reasonable estimate of the types of land uses that would locate at the project site and their associated traffic and noise generation.

CEQA Guidelines Section 15151 states that the "evaluation of the environmental effects need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible." Thus the EIR is adequate because it provides detailed analysis of the known project characteristics but does not engage in speculation over those characteristics of project operation that cannot be known at this time.

The "definite orientation and type of structures" for all of the proposed buildings and other site improvements is also known and clearly defined in the Draft EIR. Specifically, the site plans for each alternative are provided in Figures 2-4 and 2-5 while building elevations and renderings are provided in Figures 5-3a through 5-9.

Comment Letter K

Community Environmental Advocates
PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

May 6, 2019

Tom Last, Community Development Director
City of Grass Valley
Re: Dorsey Marketplace Project DEIR Comments

Land Use/ Housing

The project has not demonstrated with assurance that it will provide housing affordable to very low, low, or moderate income households. Without a specific calculation by the applicant of rents to be offered and a method to assure their affordability (such as a condition of approval or a deed restriction), there can be no such assurance. A percentage of the units must include these assurances in order to provide some level of mitigation to impacts on housing affordability. It should be noted that there is an assumption in the Grass Valley Housing Element that R-3 units will be affordable which affected conclusions in the environmental review of the Housing Element. If this project does not meet that expectation, impacts will be significant and unavoidable without the recommended mitigation. K-1

Aesthetics

The development is in an area that currently has a filtered Ridgeline view from SR 20/49 along sections of Dorsey Drive and from the hospital area. The proposal to build 3 story dwelling units close to the freeway violates the policies in the General Plan that designated sections of SR20 and SR 49 as "Scenic Corridors".

The project would eliminate a hill top, cutting off 20' and the existing woodlands, and replace it with massive built up pads (45-60 feet of fill) and vertical structures 20-30 feet tall, plainly visible thoughout the valley. (appendix_B_project_plans.pdf, pgs. 9,10) Vegetation plantings on steep downslopes below the filled region will not provide sufficient screening. K-2

The proposed development will add yet more walls along SR 20/49. There has been an ever-expanding use of walls along this route that has converted a once attractive rural vista into Roseville style prison walls. Walls below the hospital and Margaret Lane have been a constant target for graffiti artists and it has taken a concerted effort to quickly re-paint targeted sections. K-3

An accurate assessment of the aesthetics cannot be made without accurate elevations to show its appearance from all sides.. In particular, the south and west viewscapes of the project should provided. The proposed mitigations seem infeasible. Scaled drawings showing general vegetation type and location outlines at 5 year and 20 year maturity K-4

Community Environmental Advocates

PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

should be presented. ***These are significant (unavoidable or avoidable) impacts that must be mitigated.*** K-4 Cont.

Transportation

The traffic study apparently does not include the revisions to the intersection design at Dorsey and Sutton, which were approved by the City of Grass Valley for the Loma Rica project. That should be included. K-5

The data for the traffic study is old, collected in 2016.
Does the traffic study include the additional traffic from the recently approved Loma Rica Ranch Phase 1 project? A current study should be done, and it should include assessment of impacts from all recently approved projects in the region.

To check the validity of the old data, comparisons at a few select intersections were made in early 2018, and these comparisons reportedly showed volumes to be within 10% of the 2016 measurements. Please provide a table comparing each of the results.

If you assume that the comparisons of data from 2016 and 2018 were sufficient to establish the degree of deviation (< 10%) from the original data, the traffic volume data should all be incremented by 10% to include that range of probable error. Was that done? If not, why not?

How much traffic increase was allowed for the additional year since the "validity check of 2018"? K-6

How will the project reduce vehicular traffic during the morning and afternoon "High School Rush Hour" when the Dorsey freeway interchange and the Dorsey/East Main intersection become overloaded? Will there be improved pedestrian and bicycle pathways to Sierra College and Nevada Union? K-7

The Spring Hill – Idaho-Maryland Rd intersection is very close to Centennial Drive intersection and vehicles turning left off of Centennial drive have a very short merge lane. Were the impacts of the interactions between the intersections assessed? Was realignment considered? K-8

Spring Hill Drive is extremely steep and is particularly hazardous in winter conditions. For this reason alone, Centennial and Spring Hill Drives should be re-aligned to a single intersection and the grade on Spring Hill Drive should be corrected. Is a build up of the intersection to correct grade on the Spring Hill Drive approach planned? K-9

Community Environmental Advocates

PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

Project Objectives ES.3: *"Incorporate safe and convenient walking paths, access to public transit, and enhanced bicycle circulation."* This is an important objective; it is not clear how this project will achieve the objective. How will the project provide connectivity to the Litton Trail, the proposed trails at Loma Rica, and the proposed trails along Wolf Creek, all of which are within a few blocks?

If these items are not addressed, they are significant (unavoidable or avoidable) impacts that must be mitigated.

K-10

Public Services

There are no parks near the proposed project.
What is the walking distance to the nearest park?
What is the walking distance to the nearest soccer field or ball field?
Where are facilities for children to be able to play?
What will be the increase in crime due to lack of facilities for youth?
Payment of fees is not a sufficient mitigation in that there are no parks nearby to apply the fees to. The project should include a pocket park at the minimum for recreation, and also to act as a mitigation for traffic, as a mitigation for GHG emissions, as a fulfillment of the walkability goals of the City of Grass Valley, and as a mitigation for aesthetics.

If these items are not addressed, they are significant (unavoidable or avoidable) impacts that must be mitigated.

K-11

Thank you,

Ralph Silberstein, Laurie Oberholtzer, Ray Bryars, Jonathan Keehn,
On behalf of Community Environmental Advocates (CEA)

INTENTIONALLY LEFT BLANK

Response to Comment Letter K

Community Environmental Advocates
Ralph Silberstein, etc
May 6, 2019

K-1 The comment states that the project has not demonstrated that it will provide affordable housing and has not identified anticipated rental rates or a method to ensure their affordability. The comment states that a percentage of the units must be offered at affordable rates and that there is an assumption in the Grass Valley Housing Element that R-3 residential units will be affordable. The comment states that if the project does not meet the affordability requirements, the impact will be significant and unavoidable.

The project site is currently designated Business Park under the General Plan and zoned Corporate Business Park (CBP). Thus the General Plan, including the Housing Element, does not assume any residential development on the project site. The Housing Element does reflect an assumption that some housing would be developed on non-residentially zoned properties throughout the City, as shown in Table III-1, with a forecast that all of the land zoned CBP within the City could support a total potential of 43 units. As shown in Housing Element Table III-5, development of residential land uses in the CBP zone district is subject to issuance of a Use Permit. This indicates that the City would have discretion in determining whether or not to allow residential development on a given CBP parcel. Thus development of residences in this zone is not by-right and therefore no specific amount of affordable housing is assumed to be developed in the CBP zone. Because the project site is not assumed to support any amount of affordable housing, the lack of a commitment for the project to include affordable housing does not represent a conflict with the Housing Element and the Draft EIR correctly concludes that the project would result in a less than significant impact associated with housing affordability, as discussed in Impact 4-3.

K-2 The comment states that filtered views of ridgeline are available from SR 20/49 looking east across the project site and the proposal violates the policies in the General Plan regarding Scenic Corridors. The comment also states that the project would cut down existing woodland and cut off the hill top by 20 feet and replace it with massive pads and vertical structures. Finally, the comment states that the vegetation screening on the steep downslopes would not be sufficient.

The comment is correct that the General Plan Open Space and Conservation Element identifies SR 20/49 as scenic highways and their routes through the City as scenic corridors. The General Plan discusses that the highways were first identified as scenic corridors in the 1972 General Plan and again in the 1982 General Plan, which established a policy of preserving "the scenic resource value of surrounding prominent hills and ridgelines" and required the City to "establish hillside development standards which will preserve the scenic quality of surrounding hills." The current 1999 General Plan Conservation and Open Space Element calls for protection of viewsheds and view corridors through policies set in the General Plan Design Element and through Design Guidelines. Section 5.2 of the Draft EIR summarizes the City's

Community Design Guidelines (Grass Valley 2002) and lists several policies from the Design Element that are applicable to the proposed project and project site. Text has been added to Section 5.2 to provide more detail related to the Design Guidelines requirements regarding protection of view corridors, including the direction that project designs "should include preservation of significant views of the natural ridge silhouettes."

The City's identification of a scenic corridor along SR 20/49 does not indicate that sites adjacent to the highway cannot be developed. In fact, numerous projects have been constructed along SR 20/49 since the City initially identified the scenic corridor in the 1972 General Plan and the project site is designated for urban development under the General Plan. The City's General Plan policies, Community Design Guidelines, and other regulations do not preclude development that is visible from SR 20/49.

The project's potential impacts to visual resources are evaluated in Chapter 5, Aesthetics. The view from SR 20/49 is represented in the Draft EIR with Key Viewpoint 3, as shown in Figure 5-1 and described on Draft EIR page 5-3. The view from northbound SR 20/49 looking east over the project site includes "rooftops of industrial buildings and parking lots to the south of the project boundary, tall woodland on the slope of the project site's hill, and tree-covered ridgelines beyond the project site." This description also notes that the Dorsey Drive off-ramp is higher in elevation than the highway surface, which limits the easterly views. Text has been added to the description of Key Viewpoint 3 to further explain views of and across the site from SR 20/49. The view from southbound SR 20/49 was also described in the Draft EIR discussion of viewpoints that were considered but rejected from further analysis because the view from that side of the highway "consists of a brick highway barrier and tall trees" (Viewpoint 9).

Key Viewpoint 4 consists of the view easterly across the project site from the terminus of Glasson Way, near the Sierra Nevada Memorial Hospital. This view is described in the Draft EIR as including "clear views of woodland at the upper elevations of the project site" and views of the ridgelines to the east.

The loss of scenic resources that are visible from SR 20/49 is considered in Impact 5-1. This analysis focuses on the loss of trees due to project construction, and finds that the project's compliance with the City's Tree Preservation Ordinance and other landscaping requirements would be sufficient to retain some of the scenic value provided by existing trees onsite because the project would be required to plant new trees. Mitigation Measure 5a includes performance standards that must be met by the final landscaping plans, including a requirement for planting around the southern, western, and eastern project boundaries that is dense enough to fully block sections of views, and that perimeter landscaping must include "species that typically reach heights at least as tall as the proposed buildings." Thus the landscaping would provide replacement of the scenic qualities provided by the existing vegetation on the project site.

The comment is correct that the proposed grading and construction would result in the loss of trees throughout the project site and changes to the site's topography. However, the comment mischaracterizes the proposed grading. As described on Draft EIR page 12-15, "the preliminary grading plan shows that up to 40 feet of cut is proposed in the central portion of

the property and up to 60 feet of fill in the southwestern portion of the property." Text has been added to the analysis of Impact 5-1 to demonstrate that these changes would not impede the existing filtered views of the ridgeline east of the project site. The project would remove the knoll located in the central portion of the project site, and the rooflines of the proposed structures in this area would be generally the same elevation as the existing ground surface. Thus the structures would not block the background views of the ridgeline to the east.

The project would place fill in the southwestern portion of the site, raising the ground elevation. Structures in this portion of the site would be visible from SR 20/49, but the buildings would be setback from the property boundary by approximately 90 feet and setback from the highway by more than 170 feet and their rooflines would be lower in elevation than the structures in the central portion of the site. Thus structures in this portion of the site would not block the background views of the ridgeline to the east.

K-3 The comment states that the project will add more walls along SR 20/49, and that the presence of walls along the highway have degraded the attractive rural vista that was present in the area and the walls have become a constant target for graffiti artists.

The project site is not directly adjacent to the mainline of SR 20/49. Rather it is adjacent to the Dorsey Drive off-ramp. At the southwestern corner of the property, the project site is approximately 35 feet from the travel lane of the off-ramp and approximately 85 feet from the nearest travel lane of the SR 20/49 mainline. Further, the project does not propose to construct a solid wall along the project's frontage on the SR 20/49 off-ramp. However Mitigation Measure 9a requires that a noise attenuation barrier be constructed between the off-ramp and the proposed residential apartment buildings in the southwestern corner of the site. The expected view from the Dorsey Drive off-ramp is shown in Figure 5-3a. This figure demonstrates that with the use of berms and landscaping, views of the noise attenuation barrier would be filtered, and no walls would be constructed adjacent to the highway travel lanes. Additionally, as discussed in Response to Comment K-2, Mitigation Measure 5a identifies performance standards that must be met by the project's landscaping to ensure that views of structures, including walls, from SR 20/49 are filtered.

K-4 The comment states that an accurate assessment of the aesthetics impacts cannot be made without accurate elevations from all sides, particularly the south and west. Additionally, the mitigation measures seem infeasible. Lastly, the project should provide scaled drawings showing general vegetation at 5 years and 20 years maturity and that the significant impacts must be mitigated.

Figures 5-3a and 5-3b provide conceptual renderings of the proposed buildings, including the view of the project from the Dorsey Drive off-ramp. Figures 5-4 through 5-9 provide elevations of several of the proposed buildings. These elevations are typical of the architectural details and the scale and massing of the proposed buildings. It is not necessary for the Draft EIR to include elevations of each individual building in order to accurately evaluate the project's potential aesthetic impacts. The changes in view from each of the four key viewpoints is

evaluated in Draft EIR Impact 5-2. This includes consideration of changes in view from the south (Key Viewpoint 1) and west (Key Viewpoints 3 and 4).

As discussed in Response to Comment K-2, Mitigation Measure 5a identifies performance standards that must be met by the project's landscaping; the City will verify compliance with these standards prior to issuance of building permits.

K-5 The comment states that the traffic study does not include the revisions to the Dorsey/Sutton intersection design, as approved for the Loma Rica project.

The Traffic Impact Analysis Report (TIAR, Appendix G to the Draft EIR) describes the lane geometrics and control utilized in the analysis are consistent with the conditions that existed when the Notice of Preparation (NOP) for the EIR was issued (2016). The comment is correct that the analysis was completed without the changes to the intersection design that were approved with the City's recent (April 2019) approval of Loma Rica Ranch Phase 1. The City's review of the Loma Rica Ranch Phase 1 project included a traffic study that confirmed the modified intersection design would not alter the anticipated traffic volumes and levels of service (Grass Valley 2019).

The Dorsey Marketplace TIAR found that without the intersection improvements, the intersection will experience unacceptable operations in the cumulative condition with or without the Dorsey Marketplace project. The cumulative condition includes buildout of Loma Rica Ranch and other development consistent with the buildout of the General Plan. The TIAR further found that the previously-identified improvement of signalizing the intersection or converting it to a roundabout would allow the intersection to operate at an acceptable level of service. Mitigation Measure 8e requires the project applicant to contribute a fair share of the costs for this improvement. Given the changes in the planned intersection configuration under the Loma Rica Ranch project, Mitigation Measure 8e has been revised. As the Dorsey Drive extension and associated intersection improvements are included in the City's Capital Improvement Program and traffic impact fee, payment of the traffic impact fee would be sufficient to ensure the project contributes a fair share towards the planned improvements to the Dorsey Drive/Sutton Way intersection.

K-6 The comment states that the traffic study data is old (2016). The comment questions whether the traffic study includes additional traffic from the recently approved Loma Rica Ranch Phase 1 project and states that a current study should be done that reflects all recently approved projects in the region. The comment notes that additional traffic data was collected in 2018 and requests that a table comparing the 2016 and 2018 results be provided. Finally, the comment states that the traffic volume data should all be increased by 10% based on the results of the 2018 traffic data collection, and should be further adjusted to reflect increases in traffic since the 2018 data was collected.

The TIAR and Draft EIR evaluate the effects of adding project-generated traffic to existing traffic volumes and the effects of adding project-generated traffic to projected cumulative traffic volumes. The contribution to traffic impacts from all recently approved and pending projects

in the study area is reflected in the TIAR and Draft EIR analysis of the year 2035 conditions with and without the proposed Dorsey Marketplace project. This includes all of the Loma Rica Ranch project, including the recently-approved Phase 1.

The traffic data was collected at the time that the environmental review of the project began. This is consistent with CEQA Guidelines Section 15125(a), which states that the existing conditions at the time that the NOP is published "will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant." Thus reliance on the 2016 traffic volume data is consistent with CEQA requirements and industry-standard practices. The 2018 traffic data collection was completed to allow comparison with the 2016 data to confirm that conditions had not changed substantially. As noted on TIAR page 5, the 2018 traffic volumes were within 10% of the 2016 volumes. Daily and hourly traffic volumes typically vary by approximately 10%, thus the 2018 traffic volumes are considered to be generally consistent with the 2016 data and the 2018 data collection confirmed that the traffic impact analysis was still valid.

Exhibit 3 shows a comparison of Year 2018 and Year 2016 traffic volumes at the Dorsey Drive Interchange. The exhibit shows the following:

- During the AM peak hour, there were 1,219 vehicles per hour (vph) on Dorsey Drive to the west of the interchange in 2016. In 2018, the traffic for this same segment was found to be 984 vph.

- During the AM peak hour, the traffic volume on Dorsey Drive to the east of the interchange was found to be 434 vph in 2016 and 325 vph in 2018.

- During the PM peak hour, there were 1,461 vph on Dorsey Drive to the west of the interchange in 2016. In 2018, the traffic for this same segment was found to be 1,439 vph.

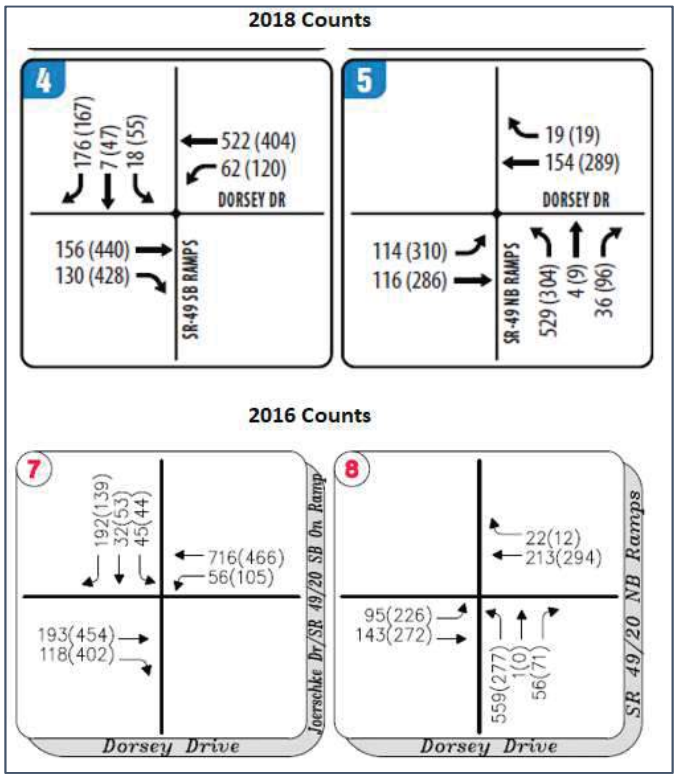
- During the PM peak hour, the traffic volume on Dorsey Drive to the east of the interchange was found to be 649 vph in 2016 and 690 vph in 2018. The increase of 41 vph translates to less than one vehicle every minute.

With the exception of the 2016 PM peak hour traffic on the east side of the interchange, 2016 data was found to be higher than the 2018 data. For this segment, the volume was found to be lower by 41 vph, which translates to less than one (1) vehicles every minute. As such, adjustments to 2016 data were not deemed necessary as this data was predominantly higher than the 2018 data.

It is not required for the traffic impacts analysis to be adjusted to reflect the time that has passed since the NOP was published, thus the traffic study was not adjusted to reflect the 2018 traffic volumes, nor was it adjusted to reflect any additional background traffic growth since 2018. The traffic volumes utilized in the analysis are consistent with the conditions that existed when the NOP for the EIR was issued (2016). CEQA Guidelines Section 15125(a)

establishes that publication of the NOP sets the baseline conditions. As such, the Existing and Existing plus Project conditions analyzed are adequate. Impacts from the Loma Rica Ranch and all other projects expected to be buildout through Year 2035 were included in the cumulative (Year 2035) conditions analysis.

Exhibit 3: Comparison of 2016 and 2018 data



K-7 The comment questions how the project would reduce traffic during the morning and afternoon high school rush hour when the Dorsey freeway interchange becomes overloaded and if there will be improved pedestrian and bicycle pathways to Sierra College and Nevada Union High School.

The TIAR and Draft EIR evaluate the impacts of the project during the AM and PM peak hours. The AM peak hour includes traffic associated with staff and students arriving at local schools. Thus the analysis presented in the TIAR and Draft EIR reflect the conditions on the Dorsey freeway interchange during the morning school rush hour. The TIAR and Draft EIR do not evaluate traffic conditions associated with afternoon school dismissal because this time typically has lower overall traffic volumes as measured over a 60-minute period compared to the evening commute period. Thus the TIAR and Draft EIR evaluate the PM peak hour rather than the hour following school dismissal.

The project's contribution to the AM peak hour traffic volumes and intersection levels of service (LOS) is analyzed in impacts 8-1 and 8-2 in Chapter 8: Transportation. The TIAR and Draft EIR

found that the LOS at the Dorsey freeway interchange would remain at an acceptable level under existing plus project and cumulative plus project conditions in the AM peak hour. Thus the project would not create or substantially contribute to adverse traffic operation effects associated with school traffic and the project is not expected to result in significant adverse impacts associated with students attending Sierra College or Nevada Union High School.

Specifically, the existing and projected traffic operations for the Dorsey Drive freeway interchange intersections are shown in Tables 8-8 and 8-9 for existing plus project conditions and Tables 8-10 and 8-12 for cumulative plus project conditions. In summary, AM peak hour operating conditions at the Dorsey Drive freeway interchange intersections are expected to be as follows:

Dorsey Drive at SR 20/49 southbound/eastbound on-ramp and Joerschke Drive

- Existing Conditions
  - AM Peak Hour no project – LOS A
  - AM Peak Hour plus Alternative A – LOS B
  - AM Peak Hour plus Alternative B – LOS B
- Cumulative Conditions
  - AM Peak Hour no project – LOS B
  - AM Peak Hour plus Alternative A – LOS B
  - AM Peak Hour plus Alternative B – LOS B

Dorsey Drive at SR 20/49 northbound/westbound ramps

- Existing Conditions
  - AM Peak Hour no project – LOS B
  - AM Peak Hour plus Alternative A – LOS C
  - AM Peak Hour plus Alternative B – LOS C
- Cumulative Conditions
  - AM Peak Hour no project – LOS B
  - AM Peak Hour plus Alternative A – LOS C
  - AM Peak Hour plus Alternative B – LOS C

As noted on Draft EIR page 8-3, there are continuous sidewalks along Dorsey Drive between Sierra College and SR 20/49. There are also continuous sidewalks along Sierra College Drive, which provides access to Nevada Union High School. The project would include construction of sidewalks along the project site frontage on Dorsey Drive but does not include construction of any offsite pedestrian or bicycle facilities. The project does not warrant construction of offsite pedestrian or bicycle facilities because the project site connects with existing pedestrian and bicycle facilities that provide access to Sierra College and Nevada Union High School.

The analysis included conditions during the morning commute hour with and without the proposed project. Impacts and necessary mitigations to mitigate the impacts were identified. Frontage improvements that typically include sidewalk will be constructed as part of the

project. The project will also pay the city traffic impact fee as established the public works department which is used to fund infrastructure projects in the City.

K-8 The comment states that the Spring Hill Drive/Idaho-Maryland Road intersection is close to the Centennial Drive intersection and the merge lanes for cars entering Idaho-Maryland Road are short. The comment questions whether these impacts were assessed and if a realignment was considered.

The project's contribution to existing peak hour traffic volumes and intersection LOS is analyzed in Impact 8-2 in Chapter 8 Transportation. As shown in Draft EIR Tables 8-8 and 8-9, the LOS at the Idaho-Maryland Road intersections with Spring Hill Drive and Centennial Drive would remain at acceptable levels with the addition of either Alternative A or Alternative B. In the cumulative condition, Alternative A would decrease the intersection operations to LOS E, but the LOS would be improved to an acceptable level with implementation of Mitigation Measure 8f, requiring creation of a right-turn pocket on Spring Hill Drive. The modeling of intersection operations includes consideration of intersection spacing and lane configurations, and how these factors affect the ability of vehicles to move through the intersection, including making right and left turns and merging into traffic. As noted on Draft EIR page 8-25, there are no substantial vertical or horizontal curves on Idaho-Maryland Road that obstruct drivers line of sight. There are no known safety deficiencies associated with the spacing between these two intersections and the project-generated traffic is not expected to create any hazards due to the spacing. The analysis was conducted based on the existing roadway geometry which included the short merge lanes and the operations resulting from the closely spaced intersections. Impacts and necessary mitigations to mitigate the impacts were identified.

The analysis evaluated the proposed project's impact to surrounding intersections and if any hazards were associated with the construction of the proposed project. No changes to the intersections of Spring Hill Drive and Centennial Drive with Idaho-Maryland Road are proposed under either Alternative A or Alternative B that could create a potential hazard.

K-9 The comment states that Spring Hill Drive is extremely steep and hazardous in winter conditions and states that Centennial and Spring Hill Drives should be realigned into a single intersection and the grade of Spring Hill Drive should be corrected. The comment then questions whether a build-up of the Spring Hill Drive intersection approach is planned.

As discussed in Response to Comment K-8, the TIAR found that the project would not adversely affect operations at the Spring Hill Drive/Idaho-Maryland Road intersection under existing plus project conditions and that feasible mitigation is available to reduce the project's contribution to significant impacts at this location in the cumulative plus project conditions. The slope of Spring Hill Drive and the relationship between the Spring Hill Drive and Centennial Drive intersections are part of the existing conditions in the project area. CEQA requires that mitigation measures imposed on a project must have a direct nexus to one or more of the project's impacts and must be roughly proportional to those impacts. The project would not contribute a substantial volume of new traffic through this intersection and thus requiring the project to reconstruct the intersection would not be roughly proportional to the project's

impacts. As shown in Exhibit 4, the city is collecting fees to improve either geometry and/or traffic control at the intersection of Idaho-Maryland and Centennial Drive. The City plans to relocate Centennial Drive to align with Spring Hill Drive to remedy the existing conditions in this area, however the proposed project cannot be required to contribute to this improvement because the project did not create this condition. Based on the existing traffic volumes through the intersections and the increase in traffic volume the project would generate, the improvement required under Mitigation Measure 8f is more appropriate than the suggested mitigation of requiring reconstruction of two intersections and associated roadway segments. The City cannot require the Dorsey Marketplace project to modify these intersections because such mitigation would not be roughly proportional to the project's impacts.

Exhibit 4: Grass Valley Traffic Impact Fee 2016 Nexus Fee Update

GV TIF ID	Facility	Segment	Cost Estimate	Costs Attributable to New Development	Costs Attributable to Existing Deficiencies (not New Development)	Funding from Other Sources - State/Federal Grants and Funding (I.e. CMAQ, RSTP, others)	City funds (i.e. Gas Tax) *
7	East Main	Bennett St to Idaho-Maryland Rd	$1,849,391	$1,849,391	$0	$0	$0
10	East Main	Idaho-Maryland Rd to Hughes Rd	$1,335,148	$130,258	$1,204,890	$1,024,156	$180,733
14	Idaho-Maryland Rd	@ Centennial Dr	$3,082,724	$3,082,724	$0	$0	$0
15	Idaho-Maryland Rd	East Main to SR-20/49 Ramps	$213,879	$213,879	$0	$0	$0
27	Ophir St	@ Bennett St	$828,953	$828,953	$0	$0	$0
29	Ridge Rd	Hughes Rd to Sierra College Dr	$751,376	$173,394	$577,981	$491,284	$86,697
35	Dorsey Drive	@ Sutton Way	$1,121,115	$1,121,115	$0	$0	$0
42	Brunswick Rd	@ Idaho-Maryland Rd	$1,299,107	$958,091	$341,016	$289,863	$51,152
45	Dorsey Drive	Extension to Brunswick Road	$5,464,511	$5,464,511	$0	$0	$0
46	Railroad Ave Extension	Extension to Bennett Rd	$2,011,362	$2,011,362	$0	$0	$0
48	Bank Street Bridge		$549,773	$142,941	$406,832	$345,807	$61,025
49	Admin Costs and 5-year reviews		1% of fees	$161,266	$0	$0	$0
50	Traffic Model		$150,000	$150,000	$0	$0	$0
	Total		$18,842,412	$16,287,886	$2,530,719	$2,151,111	$379,608

Notes
* Typically a match is required for grant funds. 15% was the assumed match.

Source: Grass Valley 2016

K-10 The comment states that it is not clear how the project will achieve the project objective related to providing facilities for pedestrians, bicyclists, and access to public transit and asks if the project would provide connectivity to Litton Trail, the proposed trails at Loma Rica and the proposed trails along Wolf Creek.

The cited project objective relates to pedestrian connectivity throughout the project site. The project would accomplish this by providing sidewalks, enhanced parking lot pedestrian paths and crosswalks, public art, pedestrian scale building frontages, and outdoor eating areas. Frontage improvements on Dorsey Drive would include provision of a sidewalk. The project would also include bicycle parking throughout the site and a bus stop with a shelter. Furthermore, the required sidewalks along Dorsey Drive for this project will provide a continuous pedestrian connection to the east along Dorsey to the proposed Loma Rica project and its trail network which will connect to the planned and approved Wolf Creek Trail system. The sidewalk improvements will also provide continuous pedestrian access to the west along Dorsey and Sierra College Drive which has access to the Litton Trail.

K-11 Regarding Public Services, the comment states that there are no parks near the proposed project, that payment of fees is not a sufficient mitigation measure and that the project should include a pocket park as mitigation for recreation, traffic, GHG emissions, aesthetics, and fulfillment of walkability goals. The comment questions if the nearest park, soccer field, and ball field is walkable, if there are facilities for children to be able to play and if there will be an increase in crime due to lack of youth facilities.

The proposed project could support a residential population of approximately 184 people under Alternative A and 351 people under Alternative B. Under both alternatives, the project would construct a swimming pool, recreational room, tot lot and dog park. The City of Grass Valley parkland requirements are provided in Draft EIR Table 14-3. Municipal Code section 17.86.030 provides a specific formula for ensuring that this standard is met. According to the standards described in the General Plan and Municipal Code, Alternative A would require 0.92 acres of park or open space and Alternative B would require 1.75 acres of park or open space under the Quimby Act. It is not required that parks or other recreational facilities are within walking distance of the project site. The Draft EIR analysis of traffic and GHG emissions includes typical travel patterns for the proposed residential uses, thus it reflects the effects of people traveling to access recreational facilities.

As discussed in Draft EIR Section 14.1, the City exceeds its park standards of providing between 5 and 8 acres per 1,000 population for community parks but does not meet its standard of 1 to 2 acres per 1,000 population for neighborhood parks. The City has developed Mautino Park (community park) and plans to develop Morgan Ranch Park (neighborhood park). Morgan Ranch has been dedicated to the City and remains open space.

The project's proposed provision of parks and open space relative to the requirements of the General Plan and Municipal Code is evaluated in Impact 14-13. Under both Alternative A and Alternative B, the project applicant would be required to pay the City's park in-lieu fees, sufficient to comply with Section 17.86.030 of the City's Municipal Code. Furthermore, Measure E, the one cent sales tax, provides long-term funding for improving existing and building new parks in the City. As shown in Appendix C of the Draft EIR, both Alternative A and Alternative B are consistent with the Parks and Recreation chapter of the General Plan. Based on the considerations outlined above, in-lieu fees would be appropriate to meet the proposed project's remaining active park requirement.

References Cited

Grass Valley, City of. 2016. City of Grass Valley City Council Agenda Action Sheet for Council Meeting Date October 11, 2016. October 2016.

Comment Letter L

Community Environmental Advocates
PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

May 6, 2019

Tom Last, Community Development Director
City of Grass Valley
Re: DEIR Climate Change Comments (Italics indicate DEIR quotes)

Overall, the DEIR is most informative and well organized. Our concerns are with impacts on climate change and the cumulative effects in several areas and whether the mitigations described are sufficient to be rendered insignificant. Those areas with cumulative impacts are primarily traffic, school, library use and parks.

In considering cumulative effects, we are not referring to just the Dorsey Marketplace, rather the whole of the new projects in the pipeline for the City of Grass Valley. Without such consideration I believe the DEIR cannot be considered adequate. One in particular is the Loma Rica project about one mile away from Dorsey Marketplace with a similar building time frame and which will essentially be impacting the same traffic intersections. As will the other 2 projects in the vicinity, Makiah Woods and Gold Country Village. L-1

Of the 5 or 6 intersections discussed as needing Mitigation Measures, we would suggest that all the MMs 8a, 8b, 8c, 8d, 8e, 8f, 8g, 8h are insufficient and have seemingly not to have been carefully considered. Merely saying that the developer will pay a fair-share cost of restriping or a traffic light or a roundabout or a pork chop something or signal optimization is not sufficient. Too many vehicles are using a finite number of badly designed intersections and roadways already. Adding approximately 1300 living units with at least 2 drivers per household into this mix is not adequate. L-2

General comments on Chapter 11 - Climate Change

PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

The background about climate change is quite thorough and a primer on our situation.

Page 11-5 states: *Relative to 1990, gross United States GHG emissions in 2016 are higher by 2.4%, down from a high of 15.7% greater than 1990 levels in 2007. GHG emissions decreased from 2015 to 2016 by 1.9% (126.8 MMT CO2e), and, overall, net emissions in 2016 were 11.1% less than 2005 levels (EPA 2018).*

But according to the recent 2019 Rhodium report: *After three years of decline, US carbon dioxide (CO2) emissions rose sharply last year. Based on preliminary power generation, natural gas, and oil consumption data, we estimate emissions increased by 3.4% in 2018. This marks the second largest annual gain in more than two decades — surpassed only by 2010 when the economy bounced back from the Great Recession.*

These latest figures should be added to the DEIR to dispel any notion that the problem is being resolved.

L-3

California SB 32 original requirement for reducing GHG emissions was to reduce them to 1990 levels by 2020. That goal was reached in 2016. Page 11-17 of the DEIR says *"SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% less than 1990 levels by 2030.* This means that California will need to reduce each year on average about 2.8 % per year. Recently, the Department of the Interior announced that new data shows the 2018 California wildfire season is estimated to have released emissions equal to about one year of power use.

This project should do all that is possible not to add to these emissions.

L-4

City Energy Plans

Community Environmental Advocates

PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

Page 11-6 states: *Neither the City of Grass Valley (City) nor Nevada County has adopted plans, policies, or regulations for the purpose of reducing GHG emissions. No official GHG inventory has been completed for the City.*

Recently both Grass Valley and Nevada County have adopted Energy Action Plans. The goal of the Grass Valley plan (page 2) is *to reduce the projected annual utility-supplied electricity use in 2035 by 36% and annual natural gas use by 29%, which translates to annual energy savings of 42,466,551 kWh of electricity and 1,410,586 therms from the projected business as usual forecast. These savings are estimated to result in over $11.5 million in annual cost savings in 2035 through reduced energy use.* The heart of the plan is contained in Chapter 3: Goals and Strategies and Chapter 4: Implementation Plan. *The goals address three key areas of energy: energy efficiency, renewable energy, and water efficiency". . Additionally, because of the projected increase in households and employment in Grass Valley, the community's residential energy use is forecast to increase by 13% and non-residential energy use is forecast to increase by 19% by 2035.*

L-5

Page 26 of the Grass Valley EAP - Strategy 2.1 of Goal 2 of the EAP states: *Prepare for the inclusion of renewable energy systems in new construction and large retrofit projects in order to meet California Zero Net Energy Goals by providing informational material when available. California's Zero Net Energy (ZNE) goals as part of the California Building Energy Efficiency Standards require new residential construction to be built to achieve ZNE standards by 2020 and new commercial construction by 2030. A ZNE building produces as much energy through clean, renewable resources as it consumes over the course of a year. These buildings are high performing, highly efficient, more resilient to economic and climate changes, offer more comfortable homes with higher resale value, and more productive workspaces. Achieving ZNE in new construction will help property owners and renters save money on energy costs, foster technological innovation, and improve the workforce skillset in Grass Valley and*

Community Environmental Advocates

PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

surrounding areas to meet these standards. The California Energy Commission's (CEC) Local PV Ordinance Cost Effectiveness Study determined that incorporating a solar PV system in all single family and multifamily new construction is currently feasible and cost effective in all climate zones in California.

The DEIR on page 11-19 states: *The key policy timelines are that all new residential construction in California will be zero net energy by 2020, and all new commercial construction in California will be zero net energy by 2030 (CPUC 2013).3 As most recently defined by CEC in its 2015 Integrated Energy Policy Report, a zero net energy code building is "one where the value of the energy produced by on-site renewable energy resources is equal to the value of the energy consumed annually by the building" using the CEC's time-dependent valuation metric (CEC 2015b).*

Thus, both the DEIR and the GV EAP both recognize the same goal of zero net energy for residential buildings in 2020 and beyond and a goal of ZNE for non-residential by 2030.

L-5 Cont.

Climate Change Impact Analysis

11-1 *Would the project impede the City or state efforts to meet AB 32 standards for the reduction of GHG emissions? Both Alternatives Potentially Significant.*
After implementing mitigation measures 11a, both alternatives remain significant but unavoidable.

Alternative A
Although Mitigation Measure 11a requires provision of site improvements that would reduce the project's GHG emission, approximately 89% of Alternative A's annual GHG emissions are from mobile sources and these would not be reduced by the

L-6

REFERENCES

ADAM. (2010). *California Environmental Protection Agency—Air Resources Board*. Retrieved from http://www.arb.ca.gov/ADAM

Bench, G., Grant, P., Ueda, D., Cliff, S., Perry, K., and Cahill, T. A. (2002). The Use of STIM and PESA to Measure Profiles of Aerosol Mass and Hydrogen Content, Respectively, Across Mylar Rotating Drums Impactor Samples. *Aerosol Sci. Technol.*, 36:642–651.

California Department of Health Services. (2010). *Web Based Inquiry for Mortality Data*. Retrieved from http://www.applications.dhs.ca.gov/vsq/default.asp accessed 3 May, 2011.

CalTrans. (2010). *CA Transportation Authority, Average Daily Truck Traffic on the California Highway System*. Retrieved from http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/truck2008final.pdf

Cahill, T., Cliff, S. S., Jimenez-Cruz, M., and Perry, K. (2003). *Aerosols by Size, Time, and Composition in Support of the Fresno Asthmatic Children's Environment Study, 2001*. Final Report to the California Air Resources Board, Sacramento, CA.

Cahill, T., Dutcher, D., Clark, C., Martin, J., McCarthy, T., and Lipnick, D. (1998). *Comparison of Cardiac and Stroke Mortality to Carbon Monoxide, Ozone, and Particulate Air Pollutant Concentrations in the Sacramento Valley Region*. Report to the Health Effects Task Force, American Lung Association Sacramento Emigrant Trails, Sacramento, CA.

Cahill, T. A., and Barnes, D. E. (2009). *Comparison of Fine Mass, UC Davis DRUM versus FRM, at the Air Resources Board 13th and T Street Site*. Final Report to the California ARB, Sacramento, CA.

Cahill, T. A., Cahill, T. M., Spada, N. J., and Barnes, D. E. (2007). *Organic and Elemental Aerosols near Watt Avenue, Late Winter—Spring, 2007*. Final Report to the Sacramento Metropolitan Air Quality Management District, Sacramento, CA.

Cahill, T. A., Eldred, R. A., Motallebi, N., and Malm, W. C. (1989). Indirect Measurement of Hydrocarbon Aerosols Across the United States by Non-sulfate Hydrogen-Remaining Gravimetric Mass Correlations. *Aerosol Sci. Technol.*, 10:421–429.

Cahill, T. A., and Feeney, P. J. (1973). *Contribution of Freeway Traffic to Airborne Particulate Matter*. Final Report of the California Air Resources Board, Contract ARB-502, Sacramento, CA.

Cahill, T. A., and Flocchini, R. G. (1974). *Regional Monitoring of Smog Aerosols*. Annual Reports to the California Air Resources Board, Contract 2–006, 1974, 1975, 1976, 1977, Sacramento, CA.

Cahill, T. A., Goodart, C., Nelson, J. W., Eldred, R. A., Nasstrom, J. S., and Feeney, P. J. (1985). Design and Evaluation of the Drum Impactor, in *Proceedings of International Symposium on Particulate and Multi-phase Processes*, T. Ariman and T. Nejat Veziroglu, eds., Hemisphere Publishing Corporation, Washington, DC, Vol. 2, pp. 319–325.

Cahill, T. M. (2010). Size-Resolved Organic Speciation of Wintertime Aerosols in the California Central Valley. *Environ. Sci. Technol.*, 44:2315–2321.

Chan, D., and Stachowiak, G. W. (2004). Review of Automotive Brake Friction Materials. *Proc. Instn. Mech. Engrs.*, 218(9):953–966.

Chen, L. W. A., Watson, J. G., Chow, J. C., and Magliano, K. L. (2007). Quantifying PM2.5 Source Contributions for the San Joaquin Valley with Multivariate Receptor Models. *Environ. Sci. Technol.*, 41(8):2818–2826.

Chow, J. C., Chen, L. W. A., Watson, J. G., Lowenthal, D. H., Magliano, K. A., Turkiewicz, K., and Lehrman, D. E. (2006). PM2.5 Chemical Composition and Spatiotemporal Variability During the California Regional PM10/PM2.5 Air Quality Study (CRPAQS). *J. Geophys. Res.—Atmos.*, 111: D10.

Chow, J. C., Watson, J. G., Lowenthal, D. H., Chen, L. W. A., Zielinska, B., Mazzoleni, L. R., and Magliano, K. L. (2007). Evaluation of Organic Markers for Chemical Mass Balance Source Apportionment at the Fresno Supersite. *Atmos. Chem. Phys.*, 7(7):1741–1754.

Chow, J. C., Watson, J. G., Lowenthal, D. H., and Magliano, K. L. (2008). Size-Resolved Aerosol Chemical Concentrations at Rural and Urban Sites in Central California, USA. *Atmos. Res.*, 90(2–4):243–252.

Devlin, R. (2003). What We Know and What We Think We Know About Health Effects of Fine Particles; Is It Enough? American Association of Aerosol Research (AAAR), Annual Meeting, Charlotte, NC.

Flocchini, R. G., Cahill, T. A., Shadoan, D. J., Lange, S. J., Eldred, R. A., Feeney, P. J., Wolfe, G. W., Simeroth, D. C., and Suder, J. K. (1976). Monitoring California's Aerosols by Size and Elemental Composition. *Environ. Sci. Technol.*, 10:76–82.

Fujita, E. M., Zielinska, B., Campbell, D. E., Arnott, W. P., Sagebiel, J. C., Mazzoleni, L., Chow, J. C., Gabele, P. A., Crews, W., Snow, R., Clark, N. N., Wayne, W. S., and Lawson, D. R. (2007). Variations in Speciated Emissions from Spark-Ignition and Compression-Ignition Motor Vehicles in California's South Coast Air Basin. *J. Air Waste Manage.*, 57(6):705–720.

Gertler, A., Abu-Allaban, M., Coulombe, W., Gillies, J. A., Pierson, W. R., Rogers, C. F., Sagebiel, J. C., Tarnay, L., and Cahill, T. A. (2003). Measurements of Mobile Source Particulate Emissions in a Highway Tunnel. *Int. J. Vehicle Des.*, 27:86–93.

Hayes, T. P., Kinney, J. J. R., and Wheeler, N. J. M. (1984). California Surface Wind Climatology State of California Air Resources Board, Aerometric Data Division, Sacramento, California.

Kennedy, P., Gadd, J., and Moncrieff, I. (2002). *Emission Factors for Contaminants Released by Motor Vehicles in New Zealand*. Ministry of Transport, Auckland, New Zealand.

Kleeman, M. J., Riddle, S. G., Robert, M. A., Jakober, C. A., Fine, P. M., Hays, M. D., Schauer, J. J., and Hannigan, M. P. (2009). Source Apportionment of Fine (PM1.8) and Ultrafine (PM0.1) Airborne Particulate Matter During a Severe Winter Pollution Episode. *Environ. Sci. Technol.*, 43(2):272–279.

Kleeman, M. J., Schauer, J. J., and Cass, G. R. (2000). Size and Composition Distribution of Fine Particulate Matter Emitted from Motor Vehicles. *Environ. Sci. Technol.*, 34(7):1132–1142.

Lippmann, M. (2009). Semi-Continuous Speciation Analyses for Ambient Air Particulate Matter: An Urgent Need for Health Effects Studies. *J. Expo. Sci. Epidemiol.*, 19:235–247.

Malm, W. C., Sisler, J. F., Huffman, D., Eldred, R. A., and Cahill, T. A. (1994). Spatial and Seasonal Trends in Particle Concentration and Optical Extinction in the United States. *J. Geophys. Res.*, 99(D1):1347–1370.

Pope, C. A., III, Thun, M., Namboodiri, M. M., Dockery, D. W., Evans, J. S., Speizer, F. E., and Heath, C. W., Jr. (1995). Particulate Air Pollution as a Predictor of Mortality in a Prospective Study of U.S. Adults. *Am. J. Respir Crit. Care Med.*, 151(3) (Part 1):669–674.

Raabe, O. G., Braaten, D. A., Axelbaum, R. L., Teague, S. V., and Cahill, T. A. (1988). Calibration Studies of the Drum Impactor. *J. Aerosol Sci.*, 19(2):183–195.

Riddle, S. G., Jakober, C. A., Robert, M. A., Cahill, T. M., Charles, M. J., and Kleeman, M. J. (2007). Large PAHs Detected in Fine Particulate Matter Emitted from Light-Duty Gasoline Vehicles. *Atmos. Environ.*, 41(38):8658–8668.

Wesolowski, J. J., John, W., Devor, W., Cahill, T. A., Feeney, P. J., Wolfe, G., and Flocchini, R. (1977). *Collection Surfaces of Cascade Impactors, in X-Ray Fluorescence Analysis of Environmental Samples*. T. Dzubay, ed., Ann Arbor Science Publishers, Ann Arbor, Michigan, pp. 121–130.

Zielinska, B., Goliff, W., McDaniel, M., Cahill, T., Kittelson, D., and Watts, W. (2003). *Chemical Analyses of Collected Diesel Particulate Matter Samples in the E-43 Project*. National Renewable Energy Laboratory, Golden, COLORADO.

Zielinska, B., Sagebiel, J., McDonald, J. D., Whitney, K., and Lawson, D. R. (2004). Emission Rates and Comparative Chemical Composition from Selected in-use Diesel and Gasoline Fueled Vehicles. *J. Air Waste Manage. Assoc.*, 54:1138–1150.

EXHIBIT 3

Atmospheric Environment 136 (2016) 31–42

Contents lists available at ScienceDirect

Atmospheric Environment

journal homepage: www.elsevier.com/locate/atmosenv

Artificial ultra-fine aerosol tracers for highway transect studies

Thomas A. Cahill [a, b, *], David E. Barnes [a], Leann Wuest [a], David Gribble [a], David Buscho [a], Roger S. Miller [a], Camille De la Croix [c]

[a] Department of Physics, University of California, Davis, CA 95616, USA
[b] Health Effects Task Force, Breathe California of Sacramento/Emigrant Trails, 909 12th Street, Suite 100, Sacramento, CA 95814, USA
[c] École Nationale Supérieure de Chimie et de Physique de Bordeaux, Bordeaux, France

ARTICLE INFO

Article history:
Received 4 December 2015
Accepted 29 March 2016
Available online 7 April 2016

Keywords:
Aerosols
Roadway configurations
Downwind distribution vs configuration
Vegetation

ABSTRACT

The persistent evidence of health impacts of roadway aerosols requires extensive information for urban planning to avoid putting populations at risk, especially in-fill projects. The required information must cover both highway aerosol sources as well as transport into residential areas under a variety of roadway configurations, traffic conditions, downwind vegetation, and meteorology. Such studies are difficult and expensive to do, but were easier in the past when there was a robust fine aerosol tracer uniquely tied to traffic – lead. In this report we propose and test a modern alternative, highway safety flare aerosols. Roadway safety flares on vehicles in traffic can provide very fine and ultra-fine aerosols of unique composition that can be detected quantitatively far downwind of roadways due to a lack of upwind interferences. The collection method uses inexpensive portable aerosol collection hardware and x-ray analysis protocols. The time required for each transect is typically 1 h. Side by side tests showed precision at ± 4%. We have evaluated this technique both by aerosol removal in vegetation in a wind tunnel and by tracking aerosols downwind of freeways as a function of season, highway configuration and vegetation coverage. The results show that sound walls for at-grade freeways cause freeway pollution to extend much farther downwind than standard models predict. The elevated or fill section freeway on a berm projected essentially undiluted roadway aerosols at distances well beyond 325 m, deep into residential neighborhoods. Canopy vegetation with roughly 70% cover reduced very fine and ultra-fine aerosols by up to a factor of 2 at distances up to 200 m downwind.

1. Introduction

Pollutants emitted from vehicles have a disproportionate impact on sensitive receptor populations, such as residences, schools, senior housing, and medical facilities, since roadways are so ubiquitous. This situation is exacerbated when efforts to reduce energy use favors infill development close to roadways. This makes the ability to accurately predict pollutant concentrations downwind of roadways critical in terms of both roadway design and urban and sub-urban planning.

Clearly, the primary effort must be to reduce toxic emission rates from vehicles on roadways. Enormous advances have been made in the past 40 years in reducing particulate pollutants from highway vehicles, including the elimination of lead from gasoline. California's pioneering effort in this regard was driven, however, primarily by the need to remover reactive hydrocarbons and oxides of nitrogen from exhaust to control ozone. The lead removal was a necessary requirement for the catalytic converter to operate. California also controlled sulfur in gasoline to avoid sulfuric acid emissions from the converter (Courtney et al., 1978). Emissions of diesel exhaust from trucks also dropped steadily in these decades. (Gertler et al., 2003; Propper et al., 2015). The stunning success of these actions resulted in less emphasis on highway impact studies in the next decade.

In the 1990s, epidemiological studies showed important health impacts near freeways, even after the elimination of lead. Specifically, there was a significant loss of lung function in children living within 1.6 km of Los Angeles freeways (Peters et al., 1999a,b; Gauderman et al., 2000). The problem was made more complex by an increased understanding of vehicular emissions, and especially the role of very fine ($0.25 > D_p > 0.1$ μm) and ultra-fine

* Corresponding author. Department of Physics, University of California, Davis, CA 95616, USA.
E-mail address: tacahill@ucdavis.edu (T.A. Cahill).

http://dx.doi.org/10.1016/j.atmosenv.2016.03.058

(<0.1 μm) insoluble aerosols on cardio-vascular disease. Very fine and ultra-fine metals are known to penetrate into the deep lung and transport into the circulatory system (Lewis et al., 2005; Chen and Lippmann, 2009; Oberdorster et al., 2007; Lippmann, 2009; Ostro et al., 2010; EPA, 2015). Traffic is increasingly implicated (Brugge et al., 2007; Hagler et al., 2009; HEI, 2009; Lin and Peng, 2010; Karner et al., 2010; WHO, 2013), with copper and iron implicated in hydroxyl radical formation in lung fluid (Charrier et al., 2014; Charrier and Anastasio, 2015). Recent publications have identified very fine and ultra-fine transition metals, including iron and copper, as a major component of "wear" aerosols from brake debris (Cahill et al., 2014; Grigoratos and Martini, 2015). These very fine and ultra-fine "wear" aerosols are tied to a very sharp (~25%) increase in ischemic heart disease death rates in Bakersfield, CA (Cahill et al., 2011).

A recent European survey noted that mass derived from "wear" aerosols from brakes, roadway resuspensions, etc. was approaching and would soon pass exhaust aerosols near roadways, with uncertain health impacts (Denier Van der Gon et al., 2013). Their consensus statement concludes, "In light of the continuous increase of the relative contribution of non-exhaust emission to ambient PM, where it is becoming the dominant emission process for urban transport, it is more than timely to devote greater efforts to properly quantifying non-exhaust emissions and assessing health relevance."

A key factor in assessing health relevance of highway pollution is establishment of transport phenomena from roadways into receptor populations, largely by downwind transect studies. The primary method used to establish transects of downwind impacts of roadways is use of highway pollutants themselves. This was especially easy when one had very fine lead uniquely associated with automobiles, and especially the unique form PbBrCl, with few interfering species. The largest study of this kind was part of the California effort in 1972 to assess the impact of lead in Los Angeles (Cahill and Feeney, 1973). While at-grade freeways without obstructions were in excellent agreement with predictions from lead emission rates and line source downwind dispersion, dramatic order of magnitude differences were seen as a function of freeway configuration (Feeney et al., 1975). Specifically, elevated or fill section freeways on a berm had 10 times the lead at 160 m downwind than the at-grade freeways. At 100 m downwind, the 24 h lead level in a residential area was 10 $\mu g/m^3$, 4 times the admittedly inadequate California standard of the time and 67 times the current US EPA standard of 0.15 $\mu g/m^3$. This problem was resolved in California by removal of lead from gasoline, required so as to not poison the catalytic converter.

Now with a new appreciation of health impacts from roadways, both from diesel exhaust and very fine and ultra-fine metals, the need for transects again becomes urgent, both to aid urban planners who might inadvertently put downwind populations at risk and also to better understand the existing health impact data. However, the very success of prior efforts at tailpipe emissions has made measurement of such transects more difficult. The competition between the highway pollutant and the regional or upwind background limits natural tracers to freeway species that dominate the local environment. An additional criterion is that the pollutant must be a robust measure of the traffic flow to allow extension of the results to other sites. Finally, priority should be given to those pollutants that have the highest chance of deleterious impact, especially to health.

In response to the health concerns and lack of data, new studies of freeway impacts have been initiated in the past 15 years. Two studies especially relevant to the health data were done in Los Angeles, first for the automobile-dominated I-405 (Zhu et al., 2002a) and the second on the heavily truck traveled I-710 freeway (Zhu et al., 2002b). I-710 connects the ports of Los Angeles and Long Beach to the intermodal truck-rail facilities near San Bernardino, and thus has very heavy truck traffic. In 2002, that averaged an average traffic flow of around 216,000 v/day with roughly 25% trucks, more than ½ with 5 axels or more (CalTrans, 2015). Further, the Zhu et al. studies occurred in the typical marine inversion of the Los Angeles basin, similar to that in the 1972 lead studies and the Peters et al., 1999b children's health data. This team used natural tracers from highway emissions, black carbon (diesel dominated), particle numbers, and carbon monoxide, upwind and downwind of the freeways (Fig. 1). There is a good to excellent correlation between black carbon, particle number, and carbon monoxide, all of which have important upwind concentrations. The pattern from the I-710 freeway was also very similar to that seen in Zhu et al., 2002a for the I-405 freeway.

The Zhu et al. data can be compared to one of the earlier lead transects from freeways in Los Angeles, 1972. (Cahill and Feeney, 1973; Feeney et al., 1975). Eighty individual 2 h transects were made near Los Angeles freeways, each with size resolved aerosol samples (Lundgren, 1967). These were placed both upwind and downwind of freeways in a variety of freeway configurations, meteorological conditions, and times of day. Each of the roughly 2400 samples was analyzed for typically 35 elements sodium to lead by particle induced x-ray emission (PIXE). (Johansson et al., 1970; Cahill, 1980). While the focus was on lead, an extremely useful element was bromine, since lead was emitted as PbBrCl from the tailpipe due to the admixture of ethyl additives (Habibi, 1973). This allowed isolation of freeway lead from other industrial sources in the Los Angeles basin. These data include an at-grade freeway, and thus are relevant to the Zhu et al. data. In Fig. 1, the 1972 at-grade freeway lead data (Cahill and Feeney, 1973) are plotted with the Zhu et al., 2002b I-710 data, normalizing to the edge-of-freeway maximum. The accord between two very different data sets taken 30 years apart is comforting, and both sets of data are in reasonable agreement with the CA ARB Emfac2007 model of roadway impacts. (ARB, 2007).

Some important items to note about these transects. First, the health data in children (Peters et al., 1999a,b) extend much farther out from freeways, to 1.6 km, than the at-grade data and models support. Also, the downwind fall off shows no sign of particle removal by coagulation, which was common when both gasoline and diesel fuel contained high levels of sulfur. Finally, it shows that CO as a diffusion limited system can be used as a surrogate for ultra-fine particles in the absence of confounding particle removal factors like vegetation.

However, there are limitations to the applicability of these and most other transect studies. First, the studies such as Zhu et al., 2002a,b are difficult and expensive, requiring a large study team, site security, access to power for the collection instrumentation, and other considerations. These factors have limited the number of freeway transects in the literature. Economics also can limit the collected species. Very fine and ultra-fine transition metal "wear" aerosols are rarely measured. It is also notable that there are important concentrations of these species upwind of the freeway, indicating an urban ultra-fine particle background that must be measured and subtracted from the freeway data.

The alternative proposed and tested in this study is to emit an artificial ultra-fine aerosol tracer that has little or no background concentrations from a vehicle on the highway. This makes detection easy and inexpensive, and if the pollutant is ultra-fine, allows studies of mitigation by removal onto vegetation.

2. Experimental methods

In increasing complexity of roadway transects in the era of ultra-

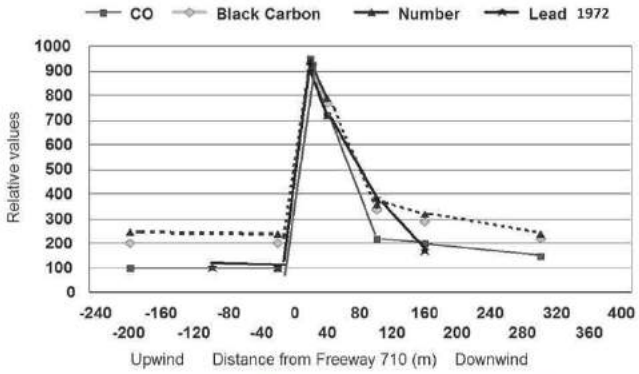


Fig. 1. Highway transect of Zhu et al., 2002b with added data from Cahill and Feeney, 1973 for lead.

fine "wear" aerosols and the need for effective mitigation can be addressed by using a very fine to ultra-fine aerosol tracer emitted by test vehicles on the highway. These requirements were met by standard highway safety flares as a potential source of the aerosols. Flares generally consist of a mixture of strontium and potassium nitrates, potassium perchlorate, finely powdered magnesium, aluminum and sulfur in a charcoal and a sawdust matrix. We used Orion™ Model #3152 15 min Emergency Flares. The flare weighs 0.17 kg and burns for 15 ± 1 min. The major aerosol component heavier than sodium is potassium, but strontium is the second most abundant aerosol at 70% of potassium. Others components are chlorine, 50% of potassium, followed by sulfur, 35%, silicon 20%, magnesium 12%, phosphorus 3%, and smaller tracers (Fujii et al., 2008). Many of these elements are easily measured by x-ray fluorescence techniques, and in their ensemble, are nothing like background aerosols in size and composition. The strontium provides the characteristic red color. The size and composition of the flares was tested in the UC Davis Engineering 60 m wind tunnel using a DELTA Group 8 DRUM impactor with 8 size modes (Raabe et al., 1988).

The velocities chosen are high enough so removal onto vegetation by very fine and ultra-fine particles is minimal. Almost all aerosol mass was smaller than 0.5 μm aerodynamic diameter. Strontium was chosen as the key tracer element since there is very little strontium in soil (375 ppm) and relatively little soil below 2.5 μm. A typical size distribution of diesel mass is shown for comparison. (Zielinska et al., 2003).

In order to evaluate whether flare aerosols were suitable for studies of mitigation by vegetation, removal studies were done on the 20 m wind tunnel of the College of Engineering, UC Davis. (Roney and White, 2006). A 2 m by 1 m section of the tunnel was loosely packed by several types of vegetation (redwood, deodar, and live oak) at about 10 times what would occur in nature. Flare aerosols were run through the vegetation at various wind speeds, and aerosol mass and composition were measured before and after the vegetation. Both mass and S-XRF data were used to quantify particle capture. The tunnel was run at wind velocities of 0.5, 1.0, 2.0, 3.0, and 4.0 m/s for each type of vegetation. Finally, the vegetation was weighed and the leaf area estimated by an LSAI 2000 plant surface area analyzer (Smolander and Stenberg, 1996).

Fig. 7 shows the result, with low wind speeds being highly effective in removing these aerosols as it allows diffusion to leaf and needle surfaces. (Fujii et al., 2008). These data also explain why the data at 2, 3, and 4 m/sec in Fig. 2 are almost identical.

3. Evaluation in field studies

For the freeway evaluations, the preferred method of aerosol tracer emission was a set of 4 flares, 15 min each, sequentially ignited in a steel housing open to the air but invisible to neighboring vehicles in the back of an open pick-up truck imbedded in traffic. The aim was to provide a line source so that the farthest downwind sampler would have the same source access as the nearest sampler, taking into account the lateral variability of the wind. If freeway access on ramps made the line source much larger than required, the number of flares was increased to provide the roughly same source strength.

The initial field evaluation was made in Detroit as part of the ongoing US EPA NEXUS study. (NEXUS, 2013; Vette et al., 2013; Baldauf et al., 2013; McGee et al., 2015). Lessons were learned showing the importance of paired off ramps that were close enough so that the test truck does not spend an inordinate amount of time away from the designed upwind line source. Since DRUM samplers (Raabe et al., 1988), were already in use, they were used to measure the very fine strontium.

For the Sacramento tests, (Cahill et al., 2013), we selected sites downwind of Interstate 5 south of the Highway 50 (W-X) freeway. The current study covered but a small subset of the potential conditions encountered near freeways. None of the freeway sections had heavy braking during the transects. In one site where no convenient freeway on ramp was available, a rolling cart with the flares was walked back and forth for an hour along a bikeway just upwind of the freeway.

3.1. Aerosol collection

Since the size distribution was very fine to ultra-fine, simple battery powered $PM_{2.5}$ Stacked Filter Units, SFUs (Cahill et al., 1977), were used to collect the samples. An inlet was set at roughly 10 μm, and the pre filter collected particles a between 10 and 2.5 μm. The 25 mm stretched Teflon after filter collected all particles <2.5 μm, validated by comparisons to standard dichotomous samplers (Cahill et al., 1990). Sampling flow was 10 l/min and sampling durations were 1 h to match the freeway emissions, yielding an areal density of 3.2 cm^2/m^3. While we had these SFU samplers available, a better choice would have been a 1.0 μm cut point cyclone at a

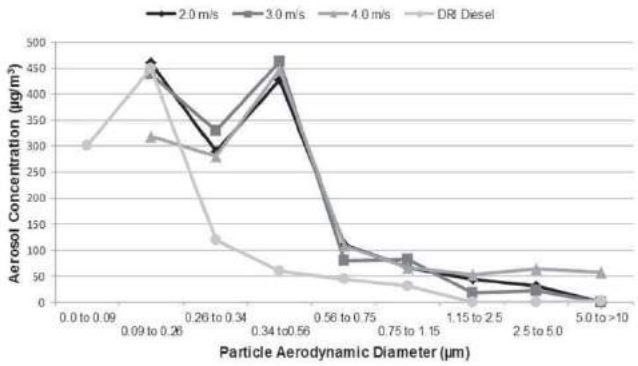


Fig. 2. Size distribution of aerosols as a function of wind velocity after passing through 2 m of loosely packed redwood branches.

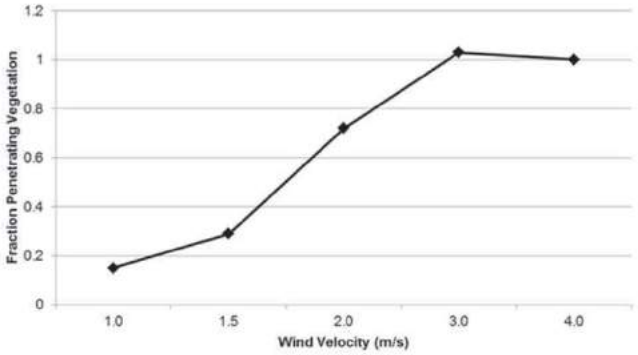


Fig. 3. Removal of flare aerosol mass by 2 m of redwood branches.

higher flow rate, which would have reduced the strontium from fine soil be an additional factor of 3 and allowed for less sensitive analytical methods.

3.2. Aerosol analysis

The analyses were performed at the Advanced Light Source, Lawrence Berkeley National Laboratory, on the UC Davis modified polarized x-ray milli-probe on Beam Line 10.3.1. Minimum detectable limit was around 2 ng/cm^2 and S-XRF protocols have been repeatedly validated, most recently in Science Magazine (Jenniskens et al., 2012). Each filter was scanned edge to edge with a 0.5 mm × 2 mm beam spot to check for depositional anomalies and establish blank values. The residual strontium was subtracted to give net flare strontium values, which were typically on the order of 20–35 ng/cm^2 for a single highway flare and a 1 h run duration.

3.3. Quality assurance

Two independent methods were used to establish the accuracy and precision of the aerosol collection and analysis. The total precision was confirmed through the use of paired SFU samplers at a downwind site, normally the 60 m site. The five side by side tests, with separate inverters and pumps, yielded a mean precision of ±4% in the ambient aerosol strontium. Since there was no detectable enhancement of sulfur at the immediately downwind site, accuracy and precision were also confirmed by the values for regional sulfur (ammonium sulfate) aerosols, showing a precision of ±9% over all SFU samplers during the entire study.

4. Meteorology

The meteorology conditions during the studies are shown for summer and fall, 2011, and winter, 2012 (see Table 1).

The summer meteorology was dominated by the strong southwest and west winds each afternoon, while fall and winter winds were more variable and generally more from the northwest.

5. Results

5.1. At-grade freeway configurations

The initial tests were done with at-grade freeways since there was so much earlier data and experience and theory are in good agreement. Data from the present studies and earlier at-grade studies relevant to the project are shown below in Table 2.

Table 1
Weather during the transects. The shaded areas are the dates used for each site.

	T avg	Rh avg	Precip	v avg	v max	Dir	Visibility	Site
August 2011								
17	76	55	0	4	30	sww	10	
18	77	53	0	5	16	sw	10	35th Ave.
19	70	62	0	9	15	sw	10	
22	74	59	0	8	25	sw	10	
23	77	55	0	2	10	west	10	10th Ave, 13th Ave.
24	80	45	0	4	20	sw	10	
Nov 2011								
12	56	76	0.01	4	12	nnw	5	fog, rain
13	57	71	0	3	14	nnw	9	10th Ave, 13th Ave.
14	57	75	0	4	12	wsw	9	
Jan 2012								
15	46	68	0	7	25	ssw	10	
16	40	50	0	3	17	nw	10	10th Ave, 35th Ave.
17	38	58	0	1	6	sse	10	

The two northern locations were chosen with streets that allowed downwind transport of freeway aerosols on the prevailing winds. The northern site, 10th Avenue, was downwind of an at-grade freeway, with a modest screen of trees at the freeway, a 1.5 m berm and a 4 m sound wall, and a clear downwind fetch without canopy vegetation.

This site was paired with site to the south at 13th Avenue, which was also an at-grade freeway, had a similar modest tree barrier and 4 m sound wall, but transported aerosols into a 70% cover tree canopy. The aim was to evaluate the role of canopy vegetation in reducing ultra-fine aerosols, building on similar work in North Carolina (Baldauf et al., 2013). Both sites are shown below in Fig. 8. Since the near upwind site had too much freeway influence, a background site was set up across the Sacramento River for the November tests (see Fig. 4).

The tests were run in summer, fall, and winter, but the winter tests did not extend into the persistent and strong surfaced based inversions that result in the highest regional $PM_{2.5}$ mass every winter (Cahill et al., 2014).

The results for the 10th Avenue tests are shown below in Fig. 5.

Turning to the other member of this pair, the 13th Avenue profile, much the same downwind pattern is seen, but with lower concentrations. The very fine and ultra-fine concentrations in summer, when the ~70% tree canopy was intact, are only about 50% of what were seen at 10th Avenue at 60 m, 82%, at 120 m, and 50% at 210 m. This is consistent with vegetation impact of the Baldauf et al., 2013 work (see Fig. 6).

However, the gross mismatches of the downwind transect data as compared to the at-grade data and modeling needs resolution. Even in winter, there are far more aerosols present at 210 m downwind than the models and data from at-grade freeways predict. Clearly, this shows that freeways with sound walls have far more downwind impact than existing models like Emfac2007 predict.

Resolution of this problem is aided by the extensive freeways transect data done in 1972 when lead was a conserved very fine freeway tracer. There was one set of tests for an at-grade freeway, but in addition two sets for elevated or fill section freeways on solid berms (Fig. 7), and three sets for depressed freeways below grade (Fig. 13). To establish a quantitative connection between on road emissions and downwind values, a "sliding box model" was used as a well-tested way to measure roadway emissions when one has access to both upwind and downwind information on pollutants, a flat terrain, and a lateral wind across the roadway (Cahill and Feeney, 1973). The dimensions of the box are set by the roadway width, including lateral turbulence, and the top of the mixed zone, set by truck vehicle height and velocity. The latter is the greatest uncertainty, but extensive data on the height of the mixed zone were taken in Los Angles in 1973 and the value, 3.5 m, was used in several studies. The length of the box is arbitrary, and we used 1.6 km. The box so defined represents a volume into which pollutants are uniformly mixed by vehicular turbulence. The lateral

Table 2
Summary of relevant transect studies for at-grade freeway configurations. Vegetation barriers were ~30% opaque at 10th and 13th Ave. A low 1.5 m berm was present at 10th Avenue. Data from other relevant studies are also included. The current studies using artificial flare aerosols are highlighted in bold type.

Freeway configuration	Vegetation	Vegetation	Season			Tracer used	Transect site
	Barrier + sound wall	Downwind canopy	Summer	Fall	Winter		2013
At-grade*	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Flare aerosols**	**10th Ave**
At-grade	**Yes**	**Yes**	**Yes**	**Yes**		**Flare aerosols**	**13th Ave**
	Barrier + sound wall	Downwind canopy	Summer	Fall	Winter		1972
At-grade	No	No	Yes			Lead	I-405
							2002
At-grade	**No**	**No**	**Yes**	**Yes**		Roadway aerosols	Zhu et al. I-710
							2007
At-grade, braking	No	No	Spring		Yes	Roadway aerosols	Watt Ave
							2010
At-grade	**No**	**No**		**Yes**		Flare and Roadway aerosols	NEXUS I-96

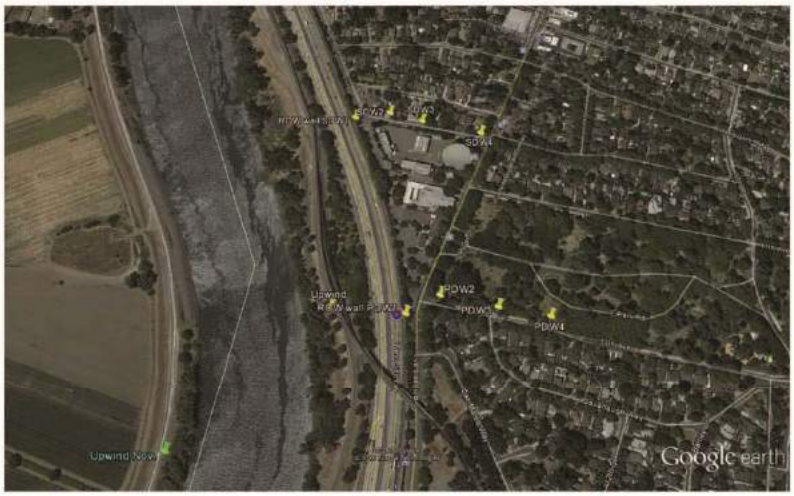


Fig. 4. Location of the 10th and 13th Avenue transects downwind of I-5 in Sacramento.

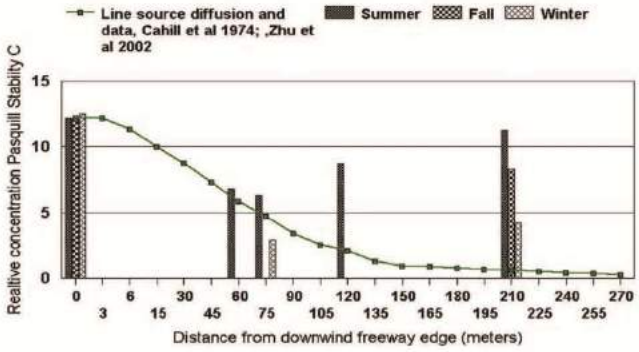


Fig. 5. Transport of very fine and ultra-fine flare tracer aerosols downwind of I-5 on 10th Avenue as a function of season. The plot also includes the line source diffusion modeling results that matched the lead (Cahill and Feeney, 1973) and fine aerosol and CO results (Zhu et al., 2002b) at at-grade freeways.

wind causes the virtual box to slide across the freeway while vehicles are emitting into the box. A new box takes its place upwind in a smooth transition and the process repeats.

Since accurate traffic data and meteorology were available and emissions of automotive lead were precisely known from the literature, (Habibi, 1973), the sliding box model gave a roadway edge prediction at the at-grade freeway section of 4.0 ± 0.4 μg/m^3 for 5000 vehicles/hr, winds > 5 km/h. The data at the at-grade site based on highway emission data (Habibi, 1972) were in excellent agreement with the model, 4.0 ± 0.6 μg/m^3 without any need for scaling. The results are shown in Table 3.

The sliding box model was also successfully applied in General Motors test facility studies of sulfur from catalytic converters. (Courtney et al., 1978).

The 1972 results from the fill section established that freeway pollution was transported downwind into residential areas far more than at-grade models and data predict, with important health impacts. The results were so at odds with the at-grade data that we returned to sample again, and at farther differences downwind, confirming and extending the earlier work.

Data were modeled using and elevated line source diffusion model with various stability classes (Cahill and Feeney, 1973, Fig. 62). Based upon qualitative observations of the meteorology, Pasquill stability class C (slightly unstable) was used as the preferred class, but model runs were done from Class A (unstable) to Class F (very stable). Modest reductions in concentration were made for particle settling based on a 1.0 μm size since our measurements showed 80% of all lead was below 5.0 μm aerodynamic diameter.

Fig. 8 shows the results for the selected Class C, Class B (more unstable) and Class D (neutral stability). The more stable classes E and F (not shown) propagated the freeway aerosols even farther

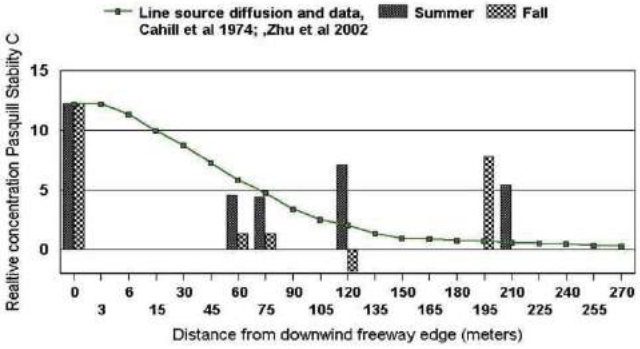


Fig. 6. Results for the 13th Avenue transects.

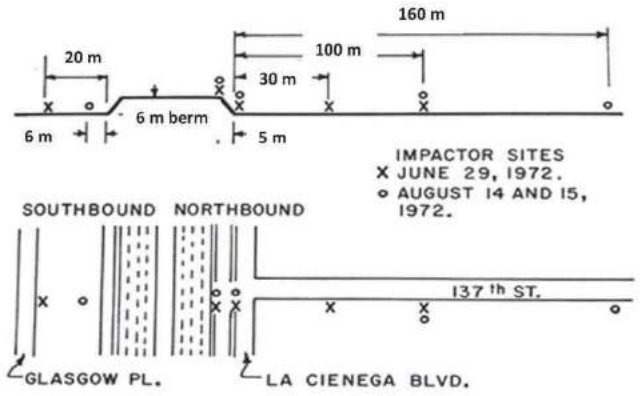


Fig. 7. Fill section on the San Diego Freeway (current I-405).

Table 3
Lead levels in μg/m³ normalized to 5000 v/h, for wind velocities >5 km/h. Prior nomenclature was I-405 (San Diego), I-10 (Santa Monica), and I-110 (Harbor) freeways.* Data were taken on a pedestrian bridge over the middle of the freeway (Fig. 13).

	Freeway sites	On freeway	Right of way fence	Downwind # 1	Downwind # 2
Freeway configuration	Distance to median	30 m	40 m	100 m	160 m
At-grade theory		4.0 ± 0.4 μg/m³	3.1 μg/m³	1.4 μg/m³	0.41 μg/m³
At-grade data	I – 405	4.0 ± 0.6 μg/m³	3.4 ± 0.6 μg/m³	1.4 ± 0.2 μg/m³	0.35 ± 0.06 μg/m³
Fill sections data	I – 405 at 137th St. (2)	4.8 ± 1.2 μg/m³	2.3 ± 0.6 μg/m³	3.1 ± 0.8 μg/m³	3.5 ± 0.9 μg/m³
Cut sections data	I–10 at 4th, (2) I-110 at 146th	4.7 ± 0.6* μg/m³	1.3 ± 0.2 μg/m³	0.3 ± 0.05 μg/m³	

from the freeway with only modest dilution. The data from Table 3 include average of all runs with wind velocities >5 km/h and upwind directions normal to the freeway, to ±45°. The semi-quantitative agreement with theory and experiment supported the observational data and confirmed that fill section freeways have major impact far downwind. At the 100 m site downwind of the fill section freeway in a residential neighborhood, the measured 24 h lead level for particles below 5 μm was 10 μg/m³ ± 2.5 μg/m³. The current US EPA standard is 0.15 μg/m³, quarterly average.

Note than as wind velocities drop to an average 1.6 km/h, the model predicts the edge of freeway value at 25 μg/m³ of lead/5000 v/hr, close to the observed 30 μg/m³ of lead/5000 v/hr observed in these conditions at two sites.

The fill section lead data seen in 1972 are added to the 10th Avenue data in Fig. 9.

The good agreement between the 1972 fill section data with the 2013 data shows that the combination of the sound wall and/or the weak (~30%) vegetation screen has turned the at-grade section into an equivalent fill section freeway, with serious implications downwind.

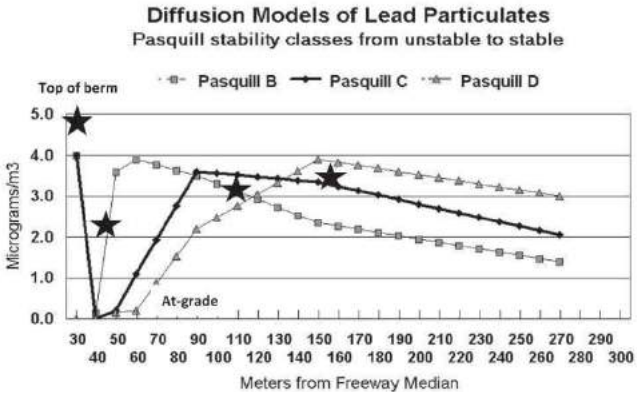


Fig. 8. Line source diffusion modeling of 1972 fill section lead data. Distances are from the freeway median, and data from Table 3 shown by stars.

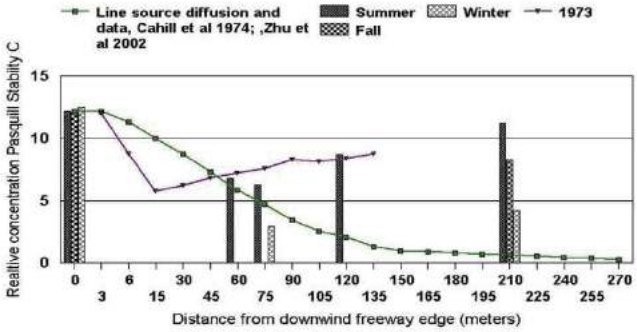


Fig. 9. Transport of flare tracer aerosols downwind of I-5 on 10th Avenue as a function of season, with a fit the lead seen at the fill section freeway site in 1973.

6. Results

6.1. Raised or fill section freeways

The final site used for these evaluations was 35th Avenue downwind of I-5 south of Sacramento. This was a complex site, with a large and opaque screen of redwood trees at the edge of a freeway on a 15 m berm above 35th Avenue (Fig. 11). This site was chosen partly to repeat the measurements done in the 1972 Los Angeles lead study on raised freeways. There was almost no tree canopy downwind. Convenient freeway off ramps allowed an efficient use of the pickup source truck in freely flowing traffic.

Below we include both the current I – 5 transects and others non-at-grade roadways relevant to the study (see Table 4 and Fig. 12).

The results for the fill section freeway in the Los Angeles lead study are also shown, as well as at at-grade freeway profiles. While the results confirm and extend the Los Angeles fill section results, the implications are unfortunate. The fill section freeway with a strong redwood screen results in reductions in roadway aerosols out to about 200 m, but beyond that point, roadway pollutants are pushed deeply into downwind residential neighborhoods far from the freeway with little dilution. There is the possibility that the redwood screen may have actually enhanced the downwind transport, acting like a massive sound wall. At the wind velocities seen during this study, diffusion onto vegetation would not be a factor, unlike during the winter inversion conditions.

At 160 m downwind, the at-grade theory, at-grade data, and Emfac2007 all predict pollution levels circa 10% of the near freeways values. However, the fill section gives 87%, of the near freeway values, and the levels were still rising farther downwind.

The profile has been recently better explained by improved models (Baldauf et al., 2013) that showing a gyre behind the berm over which the freeway air passes with little dilution (Fig. 13).

The result of these early experiments showed that impact studies of roadways must include all highway configurations, greatly increasing the number of transects required. This result was neglected in the assumption that by removing lead from gasoline would also remove freeway health impacts. That assumption is no longer tenable, and the need for many more transects drives our attempt to develop better methods are needed to achieve this goal.

One meteorological condition that was not encountered in these tests was the typical winter inversions common in the California Central valley. Models show that in this case on roadway pollutants reach their maximum values, and it is in these conditions with low wind velocities that diffusion of ultra-fine pollutants onto

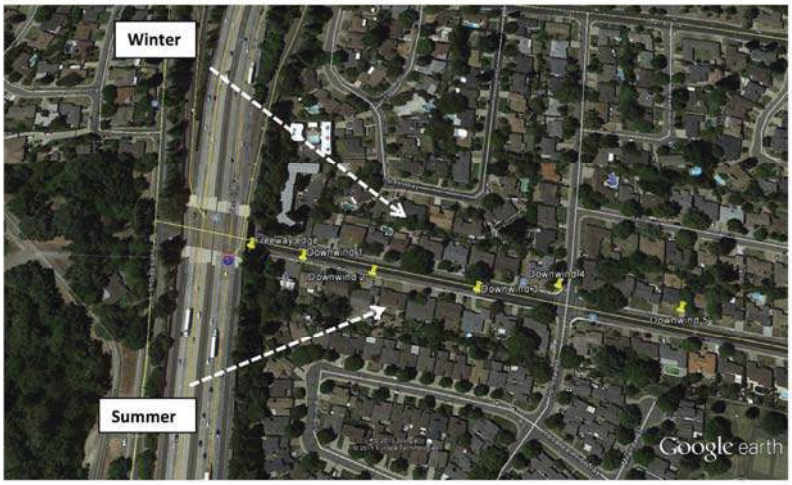


Fig. 10. Location of the 35th Avenue transect downwind of I-5 in Sacramento. The wind in the summer test was from the southwest, while the winter winds were from the northwest (marked).

Fig. 11. Redwood barrier east (and west, not shown) of Interstate 5 at 35th Avenue.

vegetation becomes most efficient (Fig. 3).

7. Results

7.1. Depressed or cut section freeways

While we had no cut section freeways in the current study, we include such data from the 1972 tests for completeness sake (Fig. 14, I-10). It, too, illustrates the dramatic order of magnitude of impacts of freeway configuration seen in Table 3. The cut section freeway was 5 times cleaner than the at-grade freeway at 100 m. As in the case of the fill section freeway, the results so differed from our expectations and that of other agencies (US EPA, 1972) that we returned to the Santa Monica freeway cut section we used before and made additional measurements.

Specifically, we placed a fast rotating 5 stage Lundgren impactor (Lundgren, 1967) directly next to the south traffic lane and placed a sampler at the middle of the pedestrian overcrossing. The pattern of optical absorption at the freeway showed a regular pattern of 7–11 min duration in which the optical absorption (soot) showed cleaner air being drawn down in to the freeway. When these data were combined with the low values at both freeway ROW fences and the elevated values directly above the freeway median, we proposed that the waste heat of the vehicles, partially trapped in this cut section, were warming the air. Using traffic and gasoline mileage, we predicted 1.0° C/minute in the sliding box mixed zone. Thus, in 7–11 min, the on freeway air had become warm enough to rise, drawing clean air in from the edges and thus sparing houses direct adjacent to the freeway. A similar effect was seen in the Watt Avenue transects Spring data (Cahill et al., 2014), and supported by

Table 4
Summary of relevant transect studies for fill and depressed freeways. The vegetation barriers was ~100% at 35th Avenue (Fig. 10).* A vegetation barrier was also present at I-10.1

Freeway configuration	Vegetation	Vegetation	Season			Tracer used	Transect site
	Barrier + sound wall	Downwind canopy	Summer	Fall	Winter		2013
Raised 12 m	**Yes**	**No**	**Yes**		**Yes**	**Flare aerosols**	**35th Ave**
	Barrier + sound wall	Downwind canopy	Summer	Fall	Winter		1973
Raised 16 m	No	No	Yes			Lead	I–405 (2)
Depressed	No*	No	Yes			Lead	I–10 (2) I–110

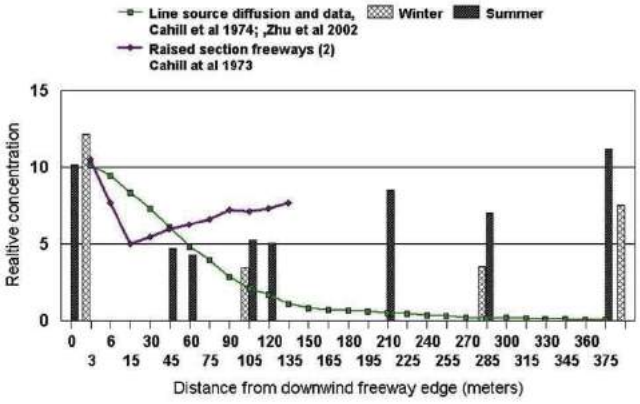


Fig. 12. Results of the 35th Avenue fill section freeway, summer and winter.

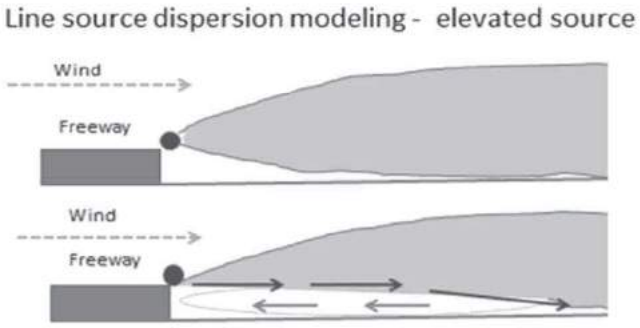


Fig. 13. Models of downwind dispersion from raised or fill section roadways. Top, the model used in Cahill and Feeney, 1973, the bottom the Baldauf et al., 2013 model.

measured temperature profiles on and across the heavily traveled roadway.

There was also a strong screen of trees at the lip of the depression, which may also have helped screen local residences from freeway impacts. We must note that the LA measurements were made in the typical summer marine inversion common in Los

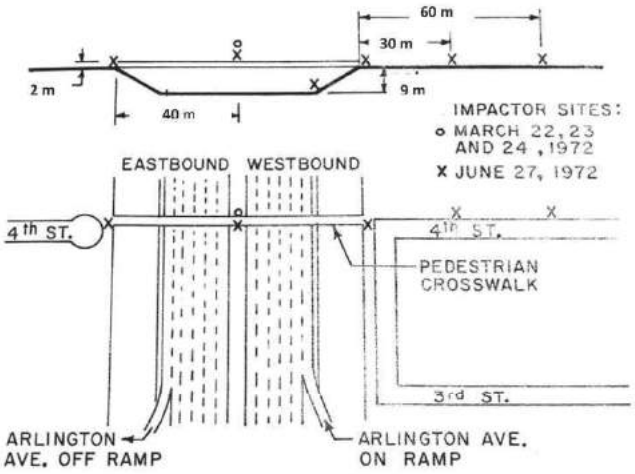


Fig. 14. Configuration and sampler placement at the Santa Monica freeway (current I-10) cut section.

Angles, with cool wind from the west. It should be tested in other metrological regimes as it provides a potential method to mitigate freeway impacts.

8. Conclusions

We present a new way to accomplish such transects accurately and inexpensively. We present and evaluate a method of tracking aerosol penetration downwind of roadway using artificial very fine and ultra-fine aerosol tracer from emergency road flares emitted from vehicles on the highways. The unique size and composition of flare aerosols allows for inexpensive, portable aerosol collection samplers and easy to analyze Teflon filters. Each measurement takes only 1 h, and can be repeated in as little as 30 min to reload filters. The method is strictly quantitative, shown by the accuracy and precision ±4% of the side by side field tests, and is capable of establishing impacts far downwind. Another option, as was done in the NEXUS study in Detroit, is using continuous collection of aerosols by rotating drum samplers, with collection onto the 0.26 to 0.09 μm DRUM size mode. The fast time response allows each study to follow diurnal patterns in traffic and meteorology. Since the very fine and ultra-fine particles are similar to the size of both "wear" and diesel aerosols, we have shown that they can mimic removal onto vegetation, a major potential means of mitigation. Thus, while the primary purpose of this work was to examine the utility of artificial ultra-fine tracer aerosols for highway transect studies under realistic conditions, the results also highlighted the need for a much more complete set of freeway transect studies including various freeway configurations, traffic conditions, downwind vegetation, and meteorology in order to predict health impacts from roadways.

Acknowledgements

The authors gratefully acknowledge the support of the Sacramento Metropolitan AQMD for this work, as well as volunteers from Breathe California/Sacramento Emigrant Trails. One of us (C. dIC) benefited from intern support from the École Nationale Supérieure de Chimie et de Physique de Bordeaux, France. We also wish to recognize the efforts made by the ALS analytical team, Dr. Yongjing Zhao, Dr. Steve Cliff, and Prof. Kevin Perry (U. Utah) for the sensitivity achieved in the filter analyses. Finally, the understanding of the Sacramento Police Department is appreciated after a bomb threat was phoned in by a resident who observed a 10th Avenue SFU sampler near the city water works. New protocols were put in place to avoid future problems.

References

ARB, 2007. Emfac2007. California Air Resources Board. www.arb.ca.gov/msei/onroad/.../docs/user_guide_Emfac2007.pdf.

Baldauf, Richard, McPherson, Greg, Wheaton, Linda, Zhang, Max, Cahill, Tom, Bailey, Chad, Hemphill-Faller, Christina, Withycombe, Earl, Titus, Kori, 2013. Integrating Vegetation and Green Infrastructure into Sustainable Transportation Planning, Transportation Research Bulletin. National Academy of Sciences.

Brugge, Doug, Durant, John L., Rioux, Christine, 2007. Near-highway pollutants in motor vehicle exhaust: a review of epidemiologic evidence of cardiac and pulmonary health risks. Environ. Health 6, 23. http://dx.doi.org/10.1186/1476-069X-6-23.

Cahill, Thomas A., Ashbaugh, Lowell L., Barone, John B., Eldred, Robert A., Feeney, Patrick J., Flocchini, Robert G., Goodart, Charles, Shadoan, Danny J., Wolfe, Gordon W., 1977. Analysis of respirable fractions in atmospheric particulates via sequential filtration. J. Air Pollut. Control Assoc. 27, 675–678.

Cahill, Thomas A., Eldred, Robert A., Feeney, Patrick J., Beveridge, Peter J., Kent Wilkinson, L., 1980. The stacked filter unit revisited. In: Mathai, C.V. (Ed.), Visibility and Fine Particles, pp. 213–222.

Cahill, T.A., Feeney, P.J., 1973. Contribution of Freeway Traffic to Airborne Particulate Matter. Final Report of the California Air Resources Board, Contract ARB-502.

Cahill, T.A., 1980. Proton microprobes and particle-induced x-ray analytical systems. Annu. Rev. Nucl. Part. Sci. 30, 211–252.

Cahill, T.A., Barnes, David E., Spada, Nicholas J., Lawton, Jonathan A., Cahill, Thomas M., 2011. Very fine and ultra-fine metals and ischemic heart disease in the California Central Valley 1: 2003 – 2007. Aerosol Sci. Technol. 45, 1125–1134.

Cahill, Thomas A., Barnes, David E., Miller, Roger E., Wuest, Leann, Barberie, Sean, Gribble, David, Buscho, David, Snyder, Jason, De la Croix, intern Camille, Martin, Jeanette, August, 2013. Ultra-fine Tracer Transects Downwind of Interstate 5, Sacramento. Final Report to the Breathe California of Sacramento/Emigrant Trails Health Effects Task Force.

Cahill, Thomas A., Barnes, David E., Spada, Nicholas J., 2014. Seasonal variability of ultra-fine metals downwind of a heavily traveled secondary road. Atmos. Environ. 94, 173–179.

Charrier, Jessica G., McFall, Alexander S., Richards-Henderson, Nicole K., Anastasio, Cort, 2014. Hydrogen peroxide formation in a surrogate lung fluid by transition metals and quinones present in particulate matter. Environ. Sci. Technol. 48 (12), 7010–7017.

Charrier, Jessica G., Anastasio, Cort, 2015. Rates of hydroxyl radical production from

transition metals and quinones in a surrogate lung fluid. Environ. Sci. Technol. 49 (15), 9317–9325.
CalTrans, http://www.dot.ca.gov/roadsandtraffic.html (2015).
Chen, L.C., Lippmann, M., 2009. Effects of metals within ambient air particulate matter (PM) on human health. Inhal. Toxicol. Int. Forum Resp. Res. 21, 1–31.
Courtney, W.J., Rheingrover, S., Pilotte, J., Kaufmann, H.C., Cahill, T.A., Nelson, J.W., 1978. Continuous observation of particulates during the general motors sulfate dispersion experiment. J. Air Pollut. Control Assoc. 28, 225–228.
Denier Van der Gon, H., Gerlofs Nijland, M., Gehrig, R., Gustafsson, M., Janssen, N., Harrison, R., Hulskotte, J., Johansson, C., Jozwicka, M., Keuken, M., Krijgsheld, K., Ntziachristos, L., Riediker, M., Cassee, F., 2013. The policy relevance of wear emissions from road transport, now and in the future—an international workshop report and consensus statement. J. Air Waste Manag. Assoc. 63, 136–149.
EPA, 2015. Workshop on Ultra Fine Particles. http://www2.epa.gov/air-research/epa-workshop-ultrafine-particle.
Feeney, P.J., Cahill, T.A., Flocchini, R.G., Eldred, R.A., Shadoan, D.J., Dunn, T., 1975. Effect of roadbed configuration on traffic derived aerosols. J. Air Pollut. Control Assoc. 25, 1145–1147.
Fujii, Eris, Jonathan, Lawton, Cahill, Thomas A., Barnes, David E., Hayes (IASTE intern), Chui, Spada, Nick, 2008. Removal Rates of Particulate Matter onto Vegetation as a Function of Particle Size. Final Report to the Breathe California of Sacramento Emigrant Trails Health Effects Task Force (HETF) and Sacramento Metropolitan AQMD.
Gauderman, W.J., McConnell, R., Gilliland, F., London, S., Thomas, D., Avol, E., Vora, H., Berhane, K., Rappaport, E.B., Lurmann, F., Margolis, H.G., Peters, J., 2000. Association between air pollution and lung function growth in southern California children. Am. J. Respir. Crit. Care Med. 162, 1383–1390.
Gertler, Alan, Mahmoud, Abu-Allaban, William, Coulombe, Gillies John, A., Pierson William, R., Rogers Rogers Fred, C., Sagebiel, John C., Tarnay, Leland, Cahill, Thomas A., 2002. Measurements of mobile source particulate emissions in a highway tunnel. Int. J. Veh. Des. 27, 86–93.
Grigoratos, Theodoros, Martini, Giorgio, 2015. Brake wear particle emissions: a review. Environ. Sci. Pollut. Res. 22 (Issue4), 2491–2504.
Habibi, Kamram, 1973. Characteristics of particulate matter in vehicle exhaust. Environ. Sci. Technol. 7, 223.
Hagler, G.S.W., Baldauf, R.W., Thoma, E.D., Long, T.R., Snow, R.F., Kinsey, J.S., Oudejans, L., Gullett, B.K., 2009. Ultrafine particles near a major roadway in Raleigh, North Carolina: downwind attenuation and correlation with traffic-related pollutants. Atmos. Environ. 43 (6), 1229–1234.
Health Effects Institute, 2009. Traffic Related Air Pollution: a Critical Review of the Literature on Emissions, Exposure, and Health Effects, HEI 17, Boston, MA.
Jenniskens, Peter, Fries, Marc D., Qing-Zhu, Yin, , et al.Worden, Simon P., 2012. Radar-enabled recovery of the Sutter's Mill Meteorite, a carbonaceous chondrite regolith breccia. Science 338, 1583–1587. http://dx.doi.org/10.1126/science.1227163.
Johansson, T.B., Akselsson, R., Johansson, S.A.E., 1970. X-ray analysis: elemental analysis at the 10^{-12} g Level. Nucl. Instrum. Methods 84, 141.
Karner, A.A., Eisinger, D.S., Neimeier, D.A., 2010. Near roadway air quality: synthesizing the findings from real world data. Environ. Sci. Technol. 44, 5334–5344.
Lewis, T.C., Robins, T.G., Dvonch, J.T., Keeler, G.J., Yip, F.Y., Mentz, G.B., Lin, X.H., Parker, E.A., Israel, B.A., Gonzalez, L., Hill, Y., 2005. Air pollution-associated changes in lung function among asthmatic children in Detroit. Environ. Health Perspect. 113, 1068–1075.
Lin, C.C., Peng, C.K., 2010. Characterization of indoor PM10, PM2.5, and ultra-fine particles in elementary school classrooms: a review. Environ. Eng. Sci. 27, 915–922.
Lippmann, Morton, 2009. Semi-continuous speciation analyses for ambient air particulate matter: an urgent need for health effects studies. J Expo. Sci. Epidemiol. Stud. 19, 235–247.
Lundgren, Dale, 1967. An aerosol sampler for determination of particle concentration as a function of size and time. J. Air Pollut. Control Assoc. 17 (Issue 4), 225–229.
McGee, M.A., Kamal, A.S., McGee, J.K., Wood, C.E., Dye, J.A., Krantz, Q.T., Landis, M.S., Gilmour, M.I., Gavett, S.H., 2015. Differential effects of particulate matter upwind and downwind of an urban freeway in an allergic mouse model. Environ. Sci. Technol. 49 (6), 3930–3939.
NEXUS, Kimbrough EPA, Sue, Shores EPA, Richard C., Whitaker EPA, Donald A., May 2013. FHWA and EPA National Near-road Study, Detroit, MI. Final report for the Detroit EPA/FHWA study. Report No.: DTFH61-07-X-30015. http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/near_road_study.
Oberdorster, Gunter, Stone, Vicki, Donaldson, Ken, March 2007. Toxicology of nanoparticles: a historical perspective. Nanotoxicology 1 (1), 2_25.
Ostro, Bart, Lipsett, Michael, Reynolds, Peggy, Goldberg, Debbie, Hertz, Andrew, Garcia, Cynthia, Henderson, Katherine D., Bernstein, Leslie, 2010. Long-term exposure to constituents of fine particulate air pollution and mortality: results from the California Teachers Study. Environ. Health Perspect. 118 (number 3), 363–369.
Peters, John M., Avol, Edward, Navidi, William, London, Stephanie J., James Gauderman, W., Lurman, Fred, Linn, William S., Margolis, Helene, Rappaport, Edward, Gong Jr., Henry, Thomas, Duncan C., 1999a. A study of twelve southern California communities with differing levels and types of air pollution I. Prevalence of respiratory morbidity. Am. J. Respir. Crit. Care Med. 159 (No. 3), 760–767.
Peters, John M., Avol, Edward, Navidi, William, London, Stephanie J., James Gauderman, W., Lurman, Fred, Linn, William S., Margolis, Helene, Rappaport, Edward, Gong Jr., Henry, Thomas, Duncan C., 1999b. A study of twelve southern California communities with differing levels and types of air pollution; II. Effects on pulmonary function. Am. J. Respir. Crit. Care Med. 159 (No. 3), 768–775.
Propper*, Ralph, Wong, Patrick, Bui, Son, Austin, Jeff, Vance, William, Alvarado, Álvaro, Croes, Bart, Luo, Dongmin, 2015. Ambient and emission trends of toxic air contaminants in California. Environ. Sci. Technol. 49 (19), 11329–11339. http://dx.doi.org/10.1021/acs.est.5b02766(20015).
Raabe, Otto G., Braaten, David A., Axelbaum, Richard L., Teague, Stephen V., Cahill, Thomas A., 1988. Calibration studies of the DRUM impactor. J. Aerosol Sci. 19 (2), 183–195. Plus personal communication 1995.
Roney, Jason A., White, Bruce R., 2006. Estimating fugitive dust emission rates using an environmental boundary layer wind tunnel. Atmos. Environ. 40 (issue 40), 7668–7685.
Smolander, Heikki, Stenberg, Pauline, 1996. Response of LAI-2000 estimates to changes in plant surface area index in a Scots pine stand. Tree Physiol. 16 (3), 345–349.
US EPA, 1972. Private Communication from a Senior EPA Scientists, R.S.
Vette, A., Burke, J., Norris, G., Landis, M., Batterman, S., Breen, M., Isakov, V., Lewis, T., Gilmour, M.I., Kamal, A., Hammond, D., Vedantham, R., Bereznicki, S., Tian, N., Croghan, C., 2013. The near-road exposures and effects of Urban Air Pollutants Study (NEXUS): study design and methods. Sci. Total Environ. 448, 38–47.
WHO, July 18, 2013. Aerosols and Health RAVIHAAP. Final Technical Report.
Zielinska, B., Goliff, W., McDaniel, M., Cahill, T., Kitteison, D., Watts, W., 2003. Chemical Analyses of Collected Diesel Particulate Matter Samples in the E-43 Project. National Renewable Energy Laboratory.
Zhu, Y., Hinds, William C., Kim, Seongheon, Sioutas, Constantinos, 2002a. Concentration and size distribution of ultrafine particles near a major highway. J. Air Waste Manag. Assoc. 52, 1032–1042.
Zhu, Y., Hinds, W.C., Kim, S., Shen, S., Sioutas, C., 2002b. Study of ultra-fine particles near a major highway with heavy duty diesel traffic. Atmos. Environ. 36, 4323–4335.

EXHIBIT 4

Aerosol Science and Technology
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/uast20

Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 2: 1974–1991

Thomas A. Cahill [a b], David E. Barnes [a], Earl Withycombe [b] & Mitchell Watnik [c]
[a] DELTA Group, University of California, Davis, California, USA
[b] The Health Effects Task Force, Breathe California of Sacramento-Emigrant Trails, Sacramento, California, USA
[c] The Statistical Laboratory, University of California, Davis, California, USA

Available online: 12 May 2011

To cite this article: Thomas A. Cahill, David E. Barnes, Earl Withycombe & Mitchell Watnik (2011): Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 2: 1974-1991, Aerosol Science and Technology, 45:9, 1135-1142

To link to this article: http://dx.doi.org/10.1080/02786826.2011.582196

Aerosol Science and Technology, 45:1135–1142, 2011
Copyright © American Association for Aerosol Research
ISSN: 0278-6826 print / 1521-7388 online
DOI: 10.1080/02786826.2011.582196

Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 2: 1974–1991

Thomas A. Cahill,[1,2] David E. Barnes,[1] Earl Withycombe,[2] and Mitchell Watnik[3]
[1]*DELTA Group, University of California, Davis, California, USA*
[2]*The Health Effects Task Force, Breathe California of Sacramento-Emigrant Trails, Sacramento, California, USA*
[3]*The Statistical Laboratory, University of California, Davis, California, USA*

The southern part of Central Valley of California in winter has long had high PM_{10} mass, which until about 1990 included sulfate, vanadium, and nickel from the burning of crude oil used to generate steam to enhance heavy petroleum recovery. In roughly 1990, natural gas became the major energy source used for steam generation. In 1989–1991, data were collected throughout California on the mortality from strokes and ischemic heart disease (IHD). Although no spatial variability was seen for strokes, the southern San Joaquin Valley was found to have IHD mortality rates roughly 60% greater than the rest of the valley. PM_{10} was statistically identified as the major factor associated with the IHD mortality. However, when the rate of IHD was reexamined in the 2003–2007 period, a sharp reduction, about 30%, was seen in the relative rates for southern San Joaquin Valley as compared with the northern Sacramento Valley. We have measured very fine and ultrafine vanadium and nickel aerosols in a winter experiment in 2009, which shows an order of magnitude reduction in vanadium and nickel aerosols as compared with the pre-1990 data, which is a consequence of the switch from burning crude oil to natural gas to generate the steam. The inference of a causal relationship between the reduced vanadium and nickel and the improved IHD rate is supported by a growing body of laboratory and epidemiological work on the toxicity of vanadium and nickel, including from oceangoing ships burning crude or residual oil.

Received 14 October 2010; accepted 27 November 2010.
The authors wish to gratefully acknowledge the input and oversight of the project by the ALASET Health Effects Task Force under Jananne Sharpless, Chair, and Betty Turner, ALASET liaison, HETF members Tom Cahill, Mel Knight, Michael Lipsett, Ralph Propper, Marc Schenker, Steve Van den Eden, and Earl Withycombe, as well as the suggestions of William Wilson, US EPA. The authors also wish to gratefully acknowledge the financial support of the Sacramento Metropolitan Air Quality Management District under its CEO, Norm Covell, and the Yolo-Solano AQMD, under its CEO, Larry Greene. Finally, the authors wish to thank Ms. Jeanette Martin for her untiring assistance in designing and assembling the original report.
Address correspondence to Thomas A. Cahill, DELTA Group, University of California-Davis, One Sheids Ave., Davis, CA 95616, USA. E-mail: tacahill@ucdavis.edu

INTRODUCTION

The Central Valley of California is well known for exhibiting in much of its area serious violations of federal PM_{10}, $PM_{2.5}$, in winter, and ozone standards, in summer, matching or exceeding those seen for any commensurate area of the United States. Yet other parts of the valley share agriculturally based land uses and meteorology and do not exhibit serious violations of these standards. Although efforts continue to control particulate matter (PM) and ozone violations, this pollutant gradient offers an ideal situation to examine the effects of pollutants on health. Many of the confounding variables seen in comparison studies, such as meteorology, land use patterns, and cigarette smoking, are very similar throughout the Valley, and a wealth of data exists on the pollutants and their sources from district air monitoring and Air Resources Board (ARB) studies. The presence of detailed analysis of mortality from ischemic heart disease (IHD) and stroke during 1989–1991 reported by the Cardiovascular Disease Outreach and Epidemiology (CORE) Program (Kao et al. 1994) and the California Department of Health Services (CADHS 2010) provides a natural opportunity to compare the pollutant data and mortality data for the identical time ranges. While this article focuses on PM effects, the original report (Cahill et al. 1998) also examined the effects of ozone and carbon monoxide (CO) on IHD and stroke mortality; some of which are presented in this article for completeness. However, complexities in the spatial and temporal gradients of ozone require further interpretation, and thus, they are not examined in any detail in this article.

BACKGROUND

The northwest-southeast trending 550 km by 100 km Central Valley of California is one of the richest agricultural areas in the world (Figure 1). In addition, there are two major metropolitan areas in the Valley, the Sacramento-Fresno regions each with about 1 million residents, and otherwise towns are generally medium (circa a few 100,000) to small and spread

FIG. 1. Map of the Central Valley of California. The northern part is referred to as the Sacramento Valley while the southern part is called the San Joaquin Valley. The areas within the dotted circumference vary in altitude from almost sea level in the Delta to a few 100 m in elevation. The small arrows denote the typical winter wind patterns (Hayes et al. 1984).

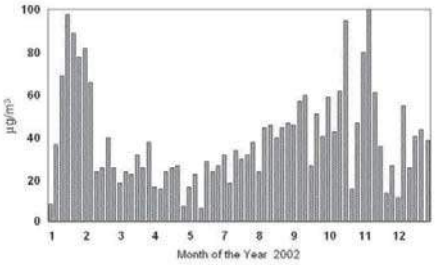


FIG. 2. PM_{10} mass at the Fresno "Super-site", 2002.

throughout the Valley. The mean population density is about 60 people/km^2.

High summer temperatures in the Valley (mean daily high, July, 36°C ± 1°C) lower the surface pressure and draw massive inputs of cool air into the Valley from the San Francisco Bay area, bringing with it oceanic aerosols and typical urban pollutants enhanced by the major petrochemical industrial sites at the Carquinez Strait. These latter sources lie directly in the path for the cold, dense winds from the San Francisco Bay. These winds funnel down the entire San Joaquin Valley, south of the strait, but rarely penetrate north very far in the Sacramento Valley, north of the strait. Rainfall in the Valley is rare during the period from May through October.

In winter, there is slow drainage of cold air off the Sierra Nevada to the Valley floor (mean daily low, January, 3°C ± 1°C) and then, at the rate of about 50 km/day, the air drains toward the lowest point, the Sacramento–San Joaquin Delta, directly east of the Carquinez Strait. Thus, little impact from the San Francisco Bay area is seen on most winter days in the Central Valley beyond the immediate Delta region. Winter rainstorms and strong northwest winds periodically clean out the Valley. Thus, the Valley tends to fall into two distinct and very different conditions: hot, dry summers with strong diurnal winds, and cool, foggy winters with long periods of stagnation. This results in two very different aerosol types: summer and winter (Figure 2).

In Figure 2, 24 h, one day in six PM_{10} mass at the Fresno 1st Street "Super-site" is shown (ADAM 2010). The site is in a largely residential neighborhood roughly 1 km east of the nearest major freeway, well away from agricultural operations. It is thus a good representation of what the average Fresno resident inhales. The annual pattern of PM_{10} mass has been consistent in the valley for many years, but this data only really became available around 1997, hence why Figure 2 uses more recent data to demonstrate the traditional annual cycle of particulate mass.

The health effects data are derived from CORE (Kao et al. 1996) and CADHS (2010). CORE collected city (>20,000 inhabitant) and countywide data on mortality from stroke and IHD; the latter is the largest source of mortality in the California Central Valley accounting for about one fourth of all deaths. The CORE data were corrected for age, >35 years, and reduced to incidence per 100,000 residents. The results were then presented as a ratio to the California average values the both males and females. Individual city data were weighted and averaged to obtain countywide averages in order to match the air pollution data.

The effect of race was examined over the entire California dataset. The data were available only in three classifications: "White," "Black," and "Other," with "Other" in the Central Valley being largely Latinos. No statistically significant difference was seen in the IHD rates for the dominant >75 years age group, but a slight enhancement of the rates for Blacks was seen in the 64- to 75-year cohort. For all ages, the mortality/100,000, 95% confidence limit, was 196 ± 3 for white males, 212 ± 9 for black males, and 199 ± 4 for other males; the corresponding values for females were 127 ± 3, 166 ± 5, and 135 ± 3. The stroke deaths, on the contrary, while only roughly one third of the rate of IHD mortality, showed stroke rates roughly twice as high for the "Black" and "Other" cohorts than the "White" cohort. Consideration was given to cigarette-smoking patterns, but no significant difference was seen along the length of the Valley (Table 1).

Four metrics for air pollution were studied, each with very different cardiovascular impacts: ozone (top 30 h and hours above 0.09 ppm), annual average CO, and annual average PM_{10}. The approximate cigarette-smoking patterns were calculated

TABLE 1
Ischemic heart disease (IHD) and stroke mortality versus air pollutants in the Central Valley of California, 1989–1991

County (north to south)	IHD rate vs. CA average (%)	Stroke rate vs. CA average (%)	Ozone top 30 h (ppm)	Ozone hours >0.09 (h)	CO annual average (ppm)	PM_{10} annual average ($\mu g/m^3$)	Smoking rate average (%)
Shasta	−14	+9	0.095	20	0.54	30	22.4
Butte	−27	−3	0.078	6	0.93	38	22.4
Sutter	−4	+26	0.090	4		44	22.8
Placer	−17	−4		125		30	22.8
Sacramento	−6	+2	0.107	153	1.29	44	23.4
Yolo	+2	+13		16		30	22.4
San Joaquin	+15	+17	0.096	36	1.13	51	22.8
Stanislaus	−7	−3	0.102	119	0.75	48	22.0
Madera	+11	−23		30		53	22.0
Fresno	+3	−12	0.129	369	0.87	77	22.0
Kings	+17	+20	0.106	21		61	22.5
Tulare	+22	+8	0.093	192	0.88	67	22.5
Kern	+33	−11	0.111	605	0.80	68	22.5

from cigarette sales data. Correlations were calculated for all parameters and are presented in Table 2 and Figures 3 and 4. At some sites, measurements were lacking. No data were deleted.

To further investigate the statistical robustness of these data, we used "proc glm" on SAS version 9.1 for the analyses. Because there are only 13 observations in total, we did not feel that imputation would prove fruitful. Therefore, we ran multiple regression models with "percentage change of IHD" and "percentage change of stroke" as the outcome variables. The possible explanatory variables were "number of hours of ozone above 0.09 ppm" ("ozone"), "annual average PM less than 10 μm, measured in micrograms per cubic meter" ("PM_{10}"), and "percentage rate of smoking" ("smoking"). We checked the assumption of normality of the errors by formally using the Shapiro–Wilk test and the assumption of homoskedasticity informally using residual plots.

The overall stroke model was not significant ($p = 0.1108$). We did not proceed further for that outcome. However, the overall IHD model was significant ($p = 0.0330$). We used backward elimination as the model selection strategy, for example, that of Neter et al. (1996). Ozone and smoking were eliminated—in that order—leaving PM_{10} as the sole significant explanatory variable ($p = 0.0026$). The resulting linear regression is given by

$$\text{estimated percentage change of IHD} = -41.5 + 0.87 \times PM_{10},$$

and the corresponding r-squared value is 0.576. It is noteworthy that Fresno appears to be an outlier. If this point is removed, the slope and r-squared values jump dramatically. We have no cause to remove that point and we therefore use the model, as indicated earlier, as our finding. However, the Fresno value includes semirural sampling sites at the urban fringe that are not present in other San Joaquin Valley cities, which had at that time only a single city center site.

However, the strong association between aerosol mass and IHD posed a problem. As additional data were developed in the Central Valley from the IMPROVE program (Malm et al. 1994) and from extensive California studies (CRPAQS 2001, Cahill et al. 2003), it became clear that the major aerosol species that dominated fine mass was ammonium nitrate, with much smaller contributions from organic matter, including a wood smoke component, and ammonium sulfate. These are however water soluble and have not been closely linked to IHD in animal and laboratory studies. (Devlin 2003; Lippmann 2009).

TABLE 2
Correlation of air pollution to mortality by IHD and stroke in the Central valley of California, 1989–1991

Mortality	Ozone average top 30 h (ppm)	Ozone number hours > 0.09 (ppm)	CO (ppm)	PM_{10} ($\mu g/m^3$)
Correlation to IHD	$r^2 = 0.18$	$r^2 = 0.27$	$r^2 < 0.05$	$r^2 = 0.56$
Correlation to stroke	$r^2 = 0.21$	$r^2 = 0.19$	$r^2 < 0.05$	$r^2 < 0.05$

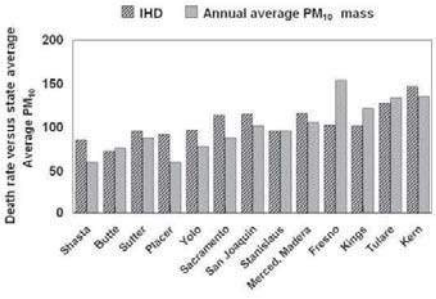


FIG. 3. Comparison of death rate from IHD, compared to the California average, and annual PM_{10} inhalable aerosol mass. Shasta County is at the very northern end of the California Central Valley, and Kern County is at the southern end.

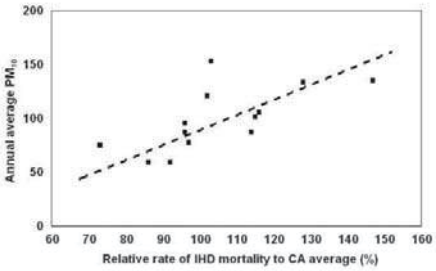


FIG. 4. IHD mortality rate relative to the California average versus PM_{10}. The parameters are associated by a regression $r^2 = 0.56$.

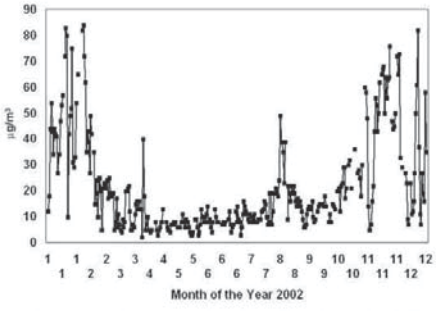


FIG. 5. $PM_{2.5}$ mass at the Fresno "Super-site," 2002, the same period used in Figure 2.

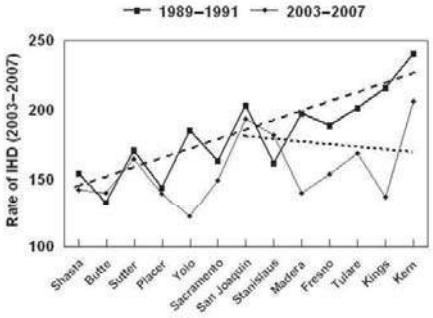


FIG. 6. IHD in the California Central valley, 1989–1991 versus 2003–2007. The 1989–1991 data are scaled to match the Shasta–Butte data, 2003–2007, as diagnostic protocols differed.

Reduction of IHD Rates: 2003–2007 Versus 1989–1991

Beginning around 1999, data on aerosol in the Central Valley were enhanced by the availability of $PM_{2.5}$ mass and chemical speciation at some San Joaquin Valley sites. In Figure 5, the same period for the Figure 2, one day in six PM_{10} mass is shown for 24 h daily fine $PM_{2.5}$ mass (ADAM 2010). The old federal 24-h $PM_{2.5}$ standard was 65 $\mu g/m^3$ and the current 24-h standard is 35 $\mu g/m^3$, which is routinely violated in winter. The annual average standard is 15 $\mu g/m^3$.

The question of IHD and aerosols was revisited for the period 2003–2007 (Cahill et al. 2010). From the recent data, it became

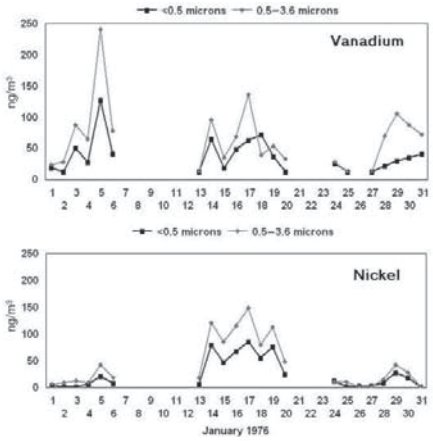


FIG. 7. Vanadium and nickel aerosols in Bakersfield, January 1976.

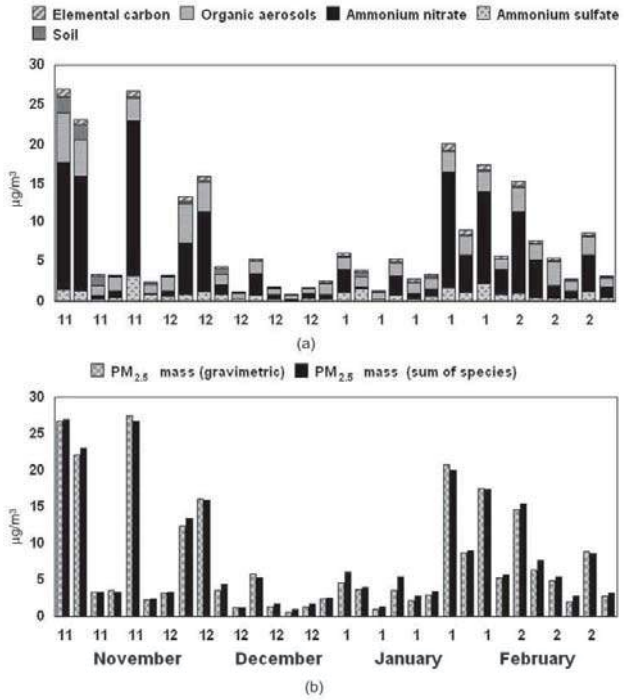


FIG. 8. (a) and (b) showing $PM_{2.5}$ mass closure and major species.

clear that a comparison of the IHD mortality, 1989–1991 versus 2003–2007, shows a major reduction, roughly 30%, that occurs in 2003–2007 for the counties north of Bakersfield (Figure 6). The trend for the northern half of the Central Valley is similar, while Bakersfield in Kern County is only slightly reduced. Thus, the question arises as to the causes for the improvement in the IHD rate.

The compositional analysis of Central Valley aerosols dates back to the early 1970s, including an innovative program of UC Davis for the California Air Resources Board (CARB), 1973–1977 (Cahill et al. 1974; Flocchini et al. 1976; Barone et al. 1978; Motallebi et al. 1990a, 1990b). A total of 14,100 daily aerosol measurements were taken in three size modes (15–3.5 μm, 3.5–0.50 μm, and 0.50–0.0 μm) and analyzed for elemental content by particle-induced x-ray emission (PIXE) (Cahill 1995) at about fourteen separate sites, including the valley sites of Chico, Sacramento, Visalia, (100 km NNE of Bakersfield), and Bakersfield. Bakersfield had one of the highest levels of vanadium and nickel aerosols in California, but port areas (Oakland, Richmond, and Los Alamitos) were also high (Figure 7).

Neither vanadium nor nickel was seen in sizes above 3.5 μm diameter. The radically different vanadium/nickel ratios occurred when winds came from the western (Taft, 40 km SW) or northern (Oildale, 5 km N) oil fields periods of stagnation, giving the highest pollution levels, favored sources in the much closer northern oil fields, some of which were within Bakersfield itself (Motallebi et al. 1990b). In addition, there was an oil refinery in Oildale, with potentially different emissions than the crude oil burned for enhanced oil recovery (EOR). Also it is noteworthy that while the vanadium and nickel concentrations can vary by over an order of magnitude, the lead levels were relatively

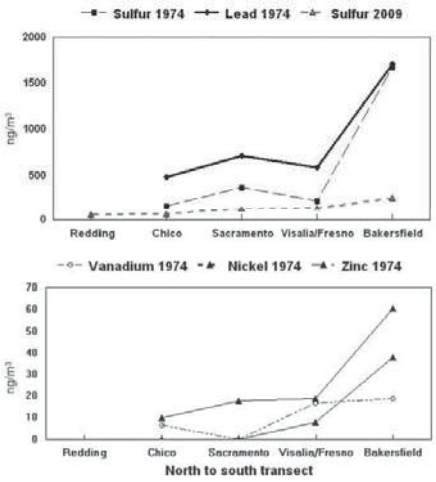


FIG. 9. Lead and sulfur, 1974–1976, versus sulfur, 2009, and vanadium, nickel, and zinc 1974–1976. Visalia lies between Bakersfield and Fresno.

constant, indicating a continuous impact of traffic-derived aerosols at Bakersfield.

Recent compositional analysis of the $PM_{2.5}$ aerosols in the southern San Joaquin Valley also became available through the IMPROVE site at Sequoia National Park (NP) starting in 1992 (Malm et al. 1994). The Sequoia NP Ash Mountain site was at low elevation, near 600 m, and thus received aerosols from the valley floor whenever the inversion lifted to that level.

IMPROVE had anticipated the value of $PM_{2.5}$ mass and full speciation, using quality assurance protocols of "integral redundancy" to measure major parameters by two or more independent methods. Sulfur from PIXE on Teflon in Channel A (Cahill 1995) is compared with sulfates after a denuder on Nylon filters in Channel B. Organic matter measured by combustion from tandem quartz filters in Channel C is compared to organic matter estimates by nonvolatile hydrogen of Teflon in Channel A (Cahill et al. 1989). Iron was measured by both PIXE and x-ray fluorescence (XRF) on the Teflon filters of Channel A. Thus, the gravimetric mass can be directly compared to the sum of all species (Figure 8b) and all major components (Figure 8a).

Figure 8 shows periodic incursions of high aerosol levels throughout the winter whenever the valley inversion rises to the altitude of Ash Mountain. Other than during these incursions, aerosol mass levels are very low, a few $\mu g/m^3$. By choosing an arbitrary concentration of 10 $\mu g/m^3$, we can be assured that we are seeing San Joaquin Valley aerosols diluted by the high inversion levels necessary for the Ash Mountain incursions. Finally, the excellent agreement between the mass of aerosol measured gravimetrically and the sum of species for all three IMPROVE channels (Figure 8a) shows that we are not missing any major component of the $PM_{2.5}$ mass.

Figure 5 showed that the violations of the annual and 24-h $PM_{2.5}$ standards in the San Joaquin Valley are driven by the winter aerosols. The high $PM_{2.5}$ values generally correspond to stable conditions with low inversions, and the clean periods to synoptic rainstorms passing through the Valley. Figure 8b shows that winter composition is dominated by fine $D_p < 2.5$ μm nitrates with smaller contributions from organic matter, wood smoke and vehicular exhaust, and some sulfates (IMPROVE 2010). The IMPROVE data also include fine metals, thus aiding our intercomparisons.

Winter data from the earlier efforts (Cahill et al. 1974, 2003; Flocchini et al. 1976) can be roughly compared with the current work (Cahill et al. 2010) by summing the four finest DRUM stages to obtain <0.56 μm particles (Table 3 and Figure 6).

Addressing the potential health impacts of these data, vanadium and nickel have the highest mortality risk coefficients of seventeen fine particulate matter (FPM) components (Lippmann et al. 2006). The elevated levels seen in 1974–1976 were sharply reduced as early as 1992–1993, using the vanadium and nickel levels in the southern San Joaquin Valley from the Sequoia IMPROVE site, although the Sequoia NP site's $PM_{2.5}$ data are not directly comparable to the valley floor's very fine (<0.5 μm) particle data. These data are shown in Figure 9. For comparison's sake, vanadium and nickel have current annual averages in FPM of 1.9 ng/m^3 across sixty metropolitan areas (MSAs) (Lippmann et al. 2006).

Examining the potential sources for the very fine (in this case <0.5 μm) particles (Table 3 and Figure 6), we see sulfur plus metals associated with crude oil combustion (vanadium and nickel), as well as lead and other vehicular metals. Kern County has very large reserves of crude oil, most of which lie just north and west of Bakersfield, although there was and is some oil extraction within the city itself. The Kern County oil fields have a heavy crude oil that requires EOR techniques such as steam injection to extract. Initially, the steam was generated by burning the crude oil itself, resulting in high pollution levels. In 1979, violations of federal air quality standards required Kern County to apply strict controls on sulfur dioxide, nitrogen dioxide, and particulate emissions, which included metals vanadium and nickel. EOR by crude oil combustion dropped slowly, 1980–1990, and then dramatically with the increasing availability of natural gas, with an immediate improvement in air quality by the early 1990s (CA Almanac). Thus, the population subject to IHD mortality in Bakersfield 1989–1991 had at least two decades of exposure to elevated high levels of very fine to ultrafine transition metals, specifically vanadium and nickel at 10–20 times the current US averages.

Laboratory data on the impact of vanadium and nickel aerosols has become more extensive (Zhang et al. 2009). Thus, we can hypothesize that the effective control of the

TABLE 3
Comparison between January 1974–1976, averaged, and January 2009. The four finest DRUM stages of the 2009 data have been summed to be PM < 0.56 μm to better match the PM < 0.5 μm data of the earlier ARB/UCD aerosol network. The Sequoia NP and Fresno winter 2002–2003 data are of $PM_{2.5}$

	Sulfur	Vanadium	Nickel	Zinc	Lead
Valley transect 2009 [January 2009 (ng/m^3) <0.56 μm]					
Redding	88.8	0.2	1.0	13.9	2.5
Chico	136.9	0.5	0.4	5.2	2.1
Sacramento	246.0	0.4	0.1	6.9	1.6
Fresno	261.4	0.3	0.5	40.3	4.9
Bakersfield	505.0	0.2	2.3	32.0	9.4
Fresno $PM_{2.5}$ (ng/m^3)					
Winter 2002	266.2	0.47	0.22	12.7	1.2
Sequoia NP (~600 m), 10 episodes $PM_{2.5}$ > 10 μg/m^3					
Winter 2002–2003 (ng/m^3)	194	0.2	0.1	4.7	1.0
Winter 1992–1993 (ng/m^3)	562	0.7	0.1	6.0	2.0
Valley transect 1974–1976 [January 1974–1976 (ng/m^3) average, <0.5 μm diameter]					
Redding	na	na	na	na	na
Chico	170	7	1	10	483
Sacramento	375	0	1	18	720
Visalia	225	17	8	19	593
Bakersfield	1685	19	38	61	1714
Port of Los Angeles					
August–September, 2008	2565	16	4	13	6

crude-oil-derived metals in the late 1980s may be responsible for the decreased IHD death rate at sites north of Bakersfield in the 1990s and beyond. This hypothesis is supported by other studies, such as the sharp drop in mortality after a sharp drop in sulfur, vanadium, and nickel in Hong Kong when the sulfur levels in fuels were lowered by edict (Hedley et al. 2002; Lippmann et al. 2006). The presence of high levels of nickel in New York City from residual oil combustion in buildings is hypothesized to be a causal factor in the enhanced mortality associated with $PM_{2.5}$ (Peltier et al. 2009; Peltier and Lippmann 2010).

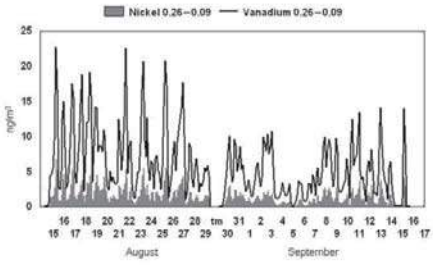


FIG. 10. Very fine ($0.26 > D_p > 0.09\ \mu$m) vanadium and nickel in Wilmington, CA, downwind during daylight hours at the Port of Los Angeles.

The current data also have relevance to the emission of sulfur, vanadium, and nickel by oceangoing ships. Recent data in New York and New Jersey (Peltier et al. 2009), and the Port of Los Angeles (Cahill et al. 2009), show the impacts of oceangoing ships burning residual or bunker oil. In the Los Angeles study, the average concentrations of fine sulfur, vanadium, and nickel in the coastal town of Wilmington in August 2008 were 2565, 16, and 4.4 ng/m^3, respectively (Table 3). Southern winds bring aerosols from the Port of Los Angeles into Wilmington routinely during part of each day (Figure 10). Ultrafine particles were not collected in this study, so the actual values could have been significantly higher than these values. Thus, on the basis of the Bakersfield data, the enhanced rates of IHD are predicted in the area.

CONCLUSION

IHD mortality in the Central Valley of California, corrected for age, race, sex, and smoking, was almost 60% greater at the more polluted southern end of the Central Valley than the less polluted northern end in 1989–1991 despite similar meteorology and land use patterns throughout the Valley. A significant association, $r^2 = 0.56$, is seen between IHD mortality and PM_{10}, but negligible correlation, $r^2 < 0.05$, is seen with stroke mortality. When PM_{10} data are converted to an estimated $PM_{2.5}$ mass

by using more recent measurements, these results are similar to other studies such as the "6 Cities" study (Dockery et al. 1993) in mortality increase per particulate mass; 1.9% mortality increase per $\mu g/m^3$ of $PM_{2.5}$ for "6 Cities," while 1.8% mortality increase per $\mu g/m^3$ of estimated $PM_{2.5}$ for this study, despite major differences in meteorology and pollutant mix. No association was seen between CO and any health impact. Ozone was only weakly correlated with IHD and stroke. However, strong east-west ozone gradients were not corrected for in this work, and thus, these results for ozone must be viewed as merely indicative of the possible impacts.

The sharp reduction seen, when the IHD data were reexamined in the period 2003–2007, was coincident with a reduction in the high levels of vanadium (19 ng/m^3) and nickel (38 ng/m^3) due to oil field operations from before 1974 to after 1990, when new protocols were adopted. The vanadium and nickel levels in 2009 were close to the national average values, both roughly 1.9 ng/m^3. The relatively smaller reduction in IHD rate in Bakersfield itself is associated with the continuing impacts of vehicular very fine and ultrafine metals (Cahill et al. 2010, this issue).

REFERENCES

ADAM. (2010). *ADAM California Environmental Protection Agency—Air Resources Board, ADAM Data Summaries*. Retrieved from www.arb.ca.gov/adam

Barone, J. B., Cahill, T. A., Eldred, R. A., Flocchini, R. G., Shadoan, D. J., and Dietz, T. M. (1978). A Multivariate Statistical Analysis of Visibility Degradation at Four California Cities. *Atmos. Environ.*, 12:2213–2221.

Cahill, T., Cliff, S. S., Jimenez-Cruz, M., and Perry, K. (2003). *Aerosols by Size, Time, and Composition in Support of the Fresno Asthmatic Children's Environment Study, 2001*. Final Report to the California Air Resources Board, Sacramento, CA.

Cahill, T., Dutcher, D., Clark, C., Martin, J., McCarthy, T., and Lipnick, D. (1998). *Comparison of Cardiac and Stroke Mortality to Carbon Monoxide, Ozone, and Particulate Air Pollutant Concentrations in the Sacramento Valley Region*. Report to the Health Effects Task Force, American Lung Association Sacramento Emigrant Trails, Sacramento, CA.

Cahill, T. A. (1995). Compositional Analysis of Atmospheric Aerosols, in *Particle-Induced X-Ray Emission Spectrometry (Chemical Analysis Series, Vol. 133)*, S. A. E. Johansson, J. L. Campbell, and K. G. Malmqvist, ed., John Wiley & Sons, Hoboken, NJ, pp. 237–311.

Cahill, T. A., Barnes, D., and Smeltzer, K. (2009). *Deposition of Coarse Toxic Particles in Wilmington, CA*. Final Report for the Department of Toxic Substances Control (DTSC), Sacramento, CA.

Cahill, T. A., Barnes, D. E., Spada, N. J., Lawton, J. A., and Cahill, T. M. (2010). Very Fine and Ultra-Fine Metals and Ischemic Heart Disease in the California Central Valley 1: 2003–2007. *Aerosol Sci. Technol.*, 45:1124–1134.

Cahill, T. A., Eldred, R. A., Motallebi, N., and Malm, W.C. (1989). Indirect Measurement of Hydrocarbon Aerosols Across the United States by Non-Sulfate Hydrogen-Remaining Gravimetric Mass Correlations. *Aerosol Sci. Tech.*, 10:421–429.

Cahill, T. A., and Flocchini, R. G. (1974). *Regional Monitoring of Smog Aerosols, Annual Reports to the California Air Resources Board, Contract 2–006, 1974, 1975, 1976, 1977*, Sacramento, CA.

California Department of Health Services. (2010). *California Department of Health Services: Center for Health Statistics Office of Health Information and Research (OHIR)*. Retrieved from http://www.dhs.ca.gov/hisp/chs/OHIR/vssdata/Tables.htm

CORE. (September 1994). *Cardiovascular Disease Outreach and Epidemiology Program. The Local Burden of Cardiovascular Disease; Death from Heart Disease and Stroke in California Cities*. Report No. 1. Kao, C., Gazzinaga, J. M., Cowling, D. W., Cohen, R. D., Fox, P., Kaplan, G. A. California Department of Health Services and the University of California, San Francisco, CA.

California Regional Particulate Air Quality Study (CRPAQS). (2001). *California Regional Particulate Air Quality Study*. Retrieved from http://www.arb.ca.gov/airways

Devlin, R. (2003). *What We Know and What We Think We Know About Health Effects of Fine Particles: Is It Enough?* Annual Meeting. American Association of Aerosol Research (AAAR), Charlotte, NC.

Dockery, D. W., Pope, C. A. III, Hu, X. P., Spengler, J. D., Ware, J. H., Fay, M. E., Ferris, B. G., and Speizer, F. E. (1993). An Association Between Air Pollution and Mortality in Six US Cities. *N. Engl. J. Med.*, 329:1725–1759.

Flocchini, R. G., Cahill, T. A., Shadoan, D. J., Lange, S. J., Eldred, R. A., Feeney, P. J., Wolfe, G. W., Simeroth, D. C., and Suder, J. K. (1976). Monitoring California's Aerosols by Size and Elemental Composition. *Environ. Sci. Technol.*, 10:76–82.

Hayes, T. P., Kinney, J. J. R., and Wheeler, N. J. M. (1984). California Surface Wind Climatology, State of California Air Resources Board, Aerometic Data Division, Sacramento, CA.

Hedley, A. J., Wong, C.-M., Thach, T. Q., MStat, S. M., Lam, T.-H., and Anderson, H. R. (2002). Cardiorespiratory and All-Cause Mortality After Restrictions on Sulfur Content of Fuel in Hong Kong: An Intervention Study. *Lancet*, 360(9346):1646–1652.

Interagency Monitoring of Protected Visual Elements (IMPROVE). (2010). Retrieved from http://vista.cira.colostate.edu/IMPROVE/

Kao, C., Gazzinaga, J. M., Cowling, D. W., Cohen, R. D., Fox, P., and Kaplan, G. A. (1994). Caralio Vascular Disease Outreach and Epidemiology Program. The Local Burden of Cardiovascular Disease; Death from Heart Disease and Stroke in California Cities. Report No. 1. California Department of Health Services and the University of California, San Francisco, CA.

Lippmann, M. (2009). Semi-Continuous Speciation Analyses for Ambient Air Particulate Matter: An Urgent Need for Health Effects Studies. *J. Expo. Sci. Epidemiol. Stud.*, 19:235–247.

Lippmann, M., Ito, K., Hwang, J. S., Maciejczyk, P., and Chen, L. C. (2006). Cardiovascular Effects of Nickel in Ambient Air. *Environ. Health Perspect.* 1141(11):1662–1669.

Malm, W. C., Sisler, J. F., Huffman, D., Eldred, R. A., and Cahill, T. A. (1994). Spatial and Seasonal Trends in Particle Concentration and Optical Extinction in the United States. *J. Geophys. Res.*, 99(D1):1347–1370.

Motallebi, N., Cahill, T. A., and Flocchini, R. G. (1990a). Influence of Particulate Size on Statistical Studies of Visibility at California Regions. *Atmosfera*, 3(2):111–126.

Motallebi, N., Flocchini, R. G., Myrup, L. O., and Cahill, T. A. (1990b). A Principal Component Analysis of Visibility and Air Pollution in Six California Cities. *Atmosfer*, 3(2):127–141.

Neter, J. W., Kutner, M. H., Nachtsheim, C. J., and Wasserman, W. (1996). *Applied Linear Statistical Models* (4th ed.). Irwin, Chicago, IL, p. 353.

Peltier, R. E., Hsu, S.-J., Lall, R., and Lippmann, M. (2009). Residual Oil Combustion: A Major Source of Airborne Nickel in New York City. *J. Expo. Sci. Epidemiol.*, 19:603–612.

Peltier, R. E., and Lippmann, M. (2010). Residual Oil Combustion: 2. Distribution of Airborne Nickel and Vanadium Within New York City. *J. Expo. Sci. Epidemiol.*, 20:342–350.

Zhang, Z., Chau, P. Y., Lai, H. K., and Wong, C. M. (2009). A Review of the Effects of Particulate Matter-Associated Nickel and Vanadium Species on Cardiovascular and Respiratory Systems. *Int. J. Environ. Health Res.*, 19(3):175–185.

EXHIBIT 5

Residential Proximity to Freeways and Autism in the CHARGE Study

ARTICLE *in* ENVIRONMENTAL HEALTH PERSPECTIVES · DECEMBER 2010

Impact Factor: 7.98 · DOI: 10.1289/ehp.1002835 · Source: PubMed

Research | Children's Health

Residential Proximity to Freeways and Autism in the CHARGE Study

Heather E. Volk,[1] Irva Hertz-Picciotto,[2] Lora Delwiche,[2] Fred Lurmann,[3] and Rob McConnell[4]

[1]Departments of Preventive Medicine and Pediatrics, Zilkha Neurogenetic Institute, Keck School of Medicine, Children's Hospital Los Angeles, University of Southern California, Los Angeles, California, USA; [2]Department of Public Health Sciences, University of California–Davis, Davis, California, USA; [3]Sonoma Technology Inc., Petaluma, California, USA; [4]Department of Preventive Medicine, Keck School of Medicine, University of Southern California, Los Angeles, California, USA

Background: Little is known about environmental causes and contributing factors for autism. Basic science and epidemiologic research suggest that oxidative stress and inflammation may play a role in disease development. Traffic-related air pollution, a common exposure with established effects on these pathways, contains substances found to have adverse prenatal effects.

Objectives: We examined the association between autism and proximity of residence to freeways and major roadways during pregnancy and near the time of delivery, as a surrogate for air pollution exposure.

Methods: Data were from 304 autism cases and 259 typically developing controls enrolled in the Childhood Autism Risks from Genetics and the Environment (CHARGE) study. The mother's address recorded on the birth certificate and trimester-specific addresses derived from a residential history obtained by questionnaire were geocoded, and measures of distance to freeways and major roads were calculated using ArcGIS software. Logistic regression models compared residential proximity to freeways and major roads for autism cases and typically developing controls.

Results: Adjusting for sociodemographic factors and maternal smoking, maternal residence at the time of delivery was more likely be near a freeway (≤ 309 m) for cases than for controls [odds ratio (OR) = 1.86; 95% confidence interval (CI), 1.04–3.45]. Autism was also associated with residential proximity to a freeway during the third trimester (OR = 2.22; CI, 1.16–4.42). After adjustment for socioeconomic and sociodemographic characteristics, these associations were unchanged. Living near other major roads at birth was not associated with autism.

Conclusions: Living near a freeway was associated with autism. Examination of associations with measured air pollutants is needed.

Key words: autism, epidemiology, gene–environment interaction, roadway proximity, traffic emissions. *Environ Health Perspect* 119:873–877 (2011). doi:10.1289/ehp.1002835 [Online 16 December 2010]

Autism is a developmental disorder characterized by significant deficits in social interaction and communication, accompanied by repetitive behaviors (American Psychiatric Association 2000). Data from family and twin studies have long supported the role of genetics in autism etiology (Abrahams and Geschwind 2008; Muhle et al. 2004). Results from linkage, copy number variation, and genomewide association studies further support the importance of genetic risk in this disease (Abrahams and Geschwind 2008; Ma et al. 2009; Wang et al. 2009). Over the last 10 years, the prevalence of diagnoses of autism, and all autism spectrum disorders, has increased (Centers for Disease Control and Prevention 2007a, 2007b, 2009). Although changes in diagnostic criteria and improved ascertainment have been thought to contribute to this increase, recent reports suggest that these factors may not fully explain the rising incidence of autism spectrum disorders (Hertz-Picciotto and Delwiche 2009; King and Bearman 2009). Therefore, it is likely that environmental factors may augment the strong genetic risks implicated in autism etiology.

Air pollution exposure during pregnancy has been reported to have physical and developmental effects on the fetus. High levels of air pollution, including carbon monoxide, nitrogen dioxide, and ambient particulate matter (PM), have been associated with very low and low birth weight, preterm birth, and infant mortality (Currie et al. 2009; Ritz and Yu 1999). Specific pollutants, including ozone, sulfur dioxide, PM, and carbon monoxide, have also been associated with significant differences in biparietal diameter and head circumference measured both during pregnancy and at birth (Hansen et al. 2008; Vassilev et al. 2001). Maternal exposure to polycyclic aromatic hydrocarbons (PAHs) during pregnancy has been associated with impaired cortical function and cognitive developmental delay (Bocskay et al. 2005; Perera et al. 2003, 2004, 2006, 2007).

Exposure to air pollution and its components, not only in the prenatal period but also in early postnatal life, has been linked to poor developmental outcomes as well. A recent epidemiologic study reported that use of gas appliances and increased nitrogen dioxide in the home during the first 3 months of life are associated with decreased cognitive test scores and increased inattention at 4 years of age (Morales et al. 2009). In a separate study, Suglia et al. (2008) estimated lifetime residential exposure to black carbon, a proxy for traffic-related PM, among 8- to 11-year-old children and reported decreased performance on intelligence and memory tasks with increasing black carbon levels. Additionally, autism has been associated with estimated regional concentrations of hazardous air pollutants, including arsenic and nickel, and with diesel PM exposure in early childhood (Windham et al. 2006).

Thus, an emerging literature suggests that near roadways, traffic-related air pollutants, possibly influenced by specific components such as PM or PAHs, affect neurodevelopment. However, the role of timing for this exposure during pregnancy or early life is not clear, nor has the relationship between traffic-related air pollutants and autism been tested. In this study, we examined the relationship between autism and traffic proximity (a marker of traffic-related air pollution) during the prenatal period and at the time of birth.

Materials and Methods

We used data from 304 autism cases and 259 typically developing general-population controls from the Childhood Autism Risks from Genetics and the Environment (CHARGE) study, a population-based case–control study of preschool children. The study design is described in detail elsewhere (Hertz-Picciotto et al. 2006). Briefly, CHARGE subjects were between 24 and 60 months of age at the time of recruitment, which occurred during 2003–2009; lived with at least one English- or Spanish-speaking biological parent; were born in California; and resided in one of the study catchment areas at the time of enrollment. Recruitment was facilitated by the California Department of Developmental Services (DDS) and the regional centers with which they contract to coordinate services for

Address correspondence to H.E. Volk, Keck School of Medicine, University of Southern California, 1540 Alcazar St. CHP 209G, Los Angeles, CA 90033 USA. Telephone: (323) 442-5101. Fax: (323) 442-3272. E-mail: hvolk@usc.edu

This work was supported by National Institute of Environmental Health Sciences grants ES019002, ES009581, ES013578, ES007048, ES11269, ES015359, and RD831861; U.S. Environmental Protection Agency Science to Achieve Results (STAR) grants R-823392 and R-833292; the MIND Institute matching funds and pilot grant program; and Autism Speaks.

F.L. is employed by Sonoma Technology Inc., which provided expert services in exposure assessment for this work. The other authors declare they have no actual or potential competing financial interests.

The authors declare they have no actual or potential competing financial interests.

Received 6 August 2010; accepted 13 December 2010.

persons with autism and other developmental disabilities. Population-based controls were recruited from the sampling frame of birth files from the State of California and were frequency matched by sex, age, and broad geographic area to the autism cases. All births were between 1997 and 2006.

Each participating family was evaluated in person. Children with a DDS diagnosis of autism were evaluated using the Autism Diagnostic Observation Schedules (ADOS), and parents were administered the Autism Diagnostic Interview–Revised (ADI-R) (Le Couteur et al. 2003; Lord et al. 2003). Children with a diagnosed developmental delay and general population controls were given the Social Communication Questionnaire (SCQ) to screen for the presence of autistic features (Rutter et al. 2003). If the SCQ score was ≥ 15, the ADOS was then administered to the child and the ADI-R to the parent. In our study, autism cases were children with a diagnosis of autism from both the ADOS and the ADI-R. All children were also assessed using the Mullen Scales of Early Learning and the Vineland Adaptive Behavior Scales to collect information on motor skills, language, socialization, and daily living skills (Mullen 1995; Sparrow et al. 1984). Controls were children sampled from the general population with typical development, defined as having received a score ≤ 15 on the SCQ and who scored in the normal range on the Mullen Scales of Early Learning and Vineland Adaptive Behavior Scales, thereby showing no evidence of other types of delay (cognitive or adaptive).

Parents were also interviewed extensively to evaluate household exposures and demographic and medical information and to assess reproductive, occupational, and residential histories. The residential history captured addresses and corresponding dates the mother and child lived at each location beginning 3 months before conception and extending to the most recent place of residence. Further details about the collection of clinical and exposure data have been previously reported (Hertz-Picciotto et al. 2006).

We examined associations of autism with traffic-related pollutant exposure using two broad proxies: distance to the nearest freeway and distance to the nearest major road. In accord with our previous research, a freeway was defined as a state highway or interstate highway (Gauderman et al. 2007). A major road was defined as a state highway, interstate highway, or major arterial (McConnell et al. 2006). Mother's residential address at birth, as recorded on the birth certificate, was geocoded, and distances to the nearest interstate highway, state highway, and major arterial road were estimated based on the shortest distance from the residence to the middle of the nearest side of each of the three road types using ArcGIS software (version 9.2; Environmental Systems Research Institute Inc., Redlands, CA). For each subject, freeway distance was then assigned as the shorter of the distances from the birth residence to a state or interstate highway. Similarly, major road distance was assigned as the shortest of the three distances: from a state highway, interstate highway, or major arterial. Under these definitions, it was possible for freeway and major road distances to be the same should the same road type (e.g., state highway) provide the shortest distance measure for a given address. For freeway and major road distances, we examined the distribution of values among the 563 subjects in our study and determined exposure cut points based on the top 10%, next 15%, and subsequent 25% of distance values for freeways and for major roads. The remaining 50% served as a reference category in each analysis.

Information from the residential history was used to estimate exposure to residential traffic during the first, second, and third trimesters of gestation for a subset of subjects with complete data (n = 485; 257 cases and 228 controls). We determined the conception date for each child using gestational age from ultrasound measurements or the date of last menstrual period, as determined from prenatal records. Then we calculated dates corresponding to each trimester and selected the appropriate address from the residential history. If more than one address fell into a trimester, we chose the address where the subjects had spent the most time. Addresses were geocoded and distances estimated as described above.

We used logistic regression to estimate the association between distance to the nearest freeway or major road and autism. Pertinent covariates were included in the model to adjust for potential confounding due to sociodemographic or lifestyle characteristics. Specifically, we included child's sex and ethnicity, maximum education level of the parents, maternal age, gestational age at birth, and maternal smoking during pregnancy. We obtained 95% confidence intervals (CIs) as measures of precision and determined statistical significance using an alpha level of 0.05.

Results

Description of sample. The study population was 84% male, and most participants were Caucasian (51%) or Hispanic (29%). We found no significant differences between cases and controls for any demographic or socioeconomic variables examined (Table 1). For most participants, geocoded birth certificate addresses (mother's residence at delivery) indicated that residences at birth were concentrated in the areas around Sacramento, Los Angeles, and the San Francisco East and North Bay.

Distance to freeway. We examined the distribution of distance from the nearest freeway among subjects in our study and determined exposure cut-points to define the closest 10% (< 309 m), the next 15% (309–647 m), and the next 25% (647–1,419 m) as exposure groups. The remaining 50% (> 1,419 m) served as the reference group in our analysis. Living within 309 m of a freeway at birth was associated with autism [odds ratio (OR) = 1.86; 95% CI, 1.04–3.45]. This association was not altered by adjustment for child sex or ethnicity, maximum education in the home, maternal age, or maternal smoking during pregnancy (Table 2). When we categorized our distance measure into deciles, only the top 10%, corresponding to the < 309-m category, showed evidence of an increased autism risk compared with those living farthest from the freeway (lowest decile, > 5,150 m; unadjusted OR = 2.48; 95% CI, 1.17–5.39).

Among the subset of subjects with available residential history data, measures for

Table 1. Demographic characteristics of CHARGE cases with autism and controls with typical development (n = 563).

Demographic variable	Percent (n) Cases (n = 304)	Controls (n = 259)	Chi-square p-value
Male sex	87 (263)	81 (211)	0.10
Child race/ethnicity			0.21
White	51 (154)	51 (131)	
Hispanic	29 (88)	30 (77)	
Black	3 (8)	2 (5)	
Asian	7 (21)	3 (8)	
Other[a]	11 (33)	15 (38)	
Maximum education in home			0.88
High school or less	7 (22)	8 (22)	
Some college	31 (95)	31 (79)	
Bachelor degree	35 (107)	36 (93)	
Graduate or professional degree	26 (80)	25 (65)	
Maternal smoking during pregnancy[b]	9 (27)	7 (18)	0.40
Maternal age ≥ 35 years	28 (85)	25 (65)	0.44
Preterm delivery (< 259 days)[c]	11 (32)	10 (25)	0.73

[a]"Other" refers to mixed race/ethnicity or other reported race/ethnicity, including Native American, Indian, East Indian, Cuban, or Mexican American. [b]Mother reported smoking at any time during pregnancy. [c]Equivalent to 37 completed weeks.

distance to the freeway were highly correlated across trimesters, reflecting the limited number of subjects who changed residence during pregnancy (n = 17 between first and second, 13 between second and third, 30 between first and third). In each trimester, living closest to the freeway (< 309 vs. > 1,419 m) was associated with autism, but the OR reached statistical significance only during the third trimester (adjusted OR = 1.96; 95% CI, 1.01–3.93). Effect estimates for the first and second trimesters were slightly lower in magnitude (first trimester: adjusted OR = 1.66; 95% CI, 0.91–3.10; second trimester: adjusted OR = 1.65; 95% CI, 0.85–3.28). After restricting the sample with birth certificate addresses to those with residential history data for all three trimesters (n = 485; 257 cases and 228 controls), the OR for autism was more than doubled among those living within 309 m of a freeway versus > 1,419 m (adjusted OR = 2.22; 95% CI, 1.16–4.42), consistent with a late-pregnancy or early-life effect.

Distance to major road. The distribution of distance from a major road among subjects in our study was reflected in exposure cut-points corresponding to ≤ 42 m (the closest 10%), 42–96 m (subsequent 15%), and 96–209 m (next 25%) as exposure groups. The remaining 50% (> 209 m) served as the reference group in our analysis. We found no consistent pattern of association of autism with proximity to a major road, and results were changed only slightly after adjusting for distance to the freeway (Table 3). Inclusion of child sex or ethnicity, maximum education in home, maternal age, or prenatal smoking in the model did not alter these associations. Results were similar for the three trimesters.

Discussion

We observed an increased risk of autism among the 10% of children living within 309 m of a freeway around the time of birth. Our findings appeared to be limited to only this group because analysis of further distances did not demonstrate associations. Analysis of trimester-specific residential information yielded associations of roughly similar magnitude, although only the effects for the third trimester and at birth reached statistical significance. The high correlations across trimesters, and lack of analysis of postnatal residences, imply that we cannot precisely define a potentially critical window.

The association of autism with proximity to freeway, and not to major road, may be related to the larger volume of traffic and concentrations of pollutants observed near freeways. In Los Angeles, for example, some freeways have more than 300,000 vehicles daily and high concentrations of traffic-related pollutants with steep gradients extending several hundred meters from the traffic corridor (Caltrans 2008; Zhu et al. 2002, 2006). Specifically, studies measuring concentration and size distribution of ultrafine PM near a major California freeway demonstrate that the PM is high nearest the freeway and becomes closer to background levels at distances ≥ 300 m (Zhu et al. 2002). Thus, our findings are consistent with the relationship between freeway proximity and PM exposures in California. Our study did not find evidence of associations with residential proximity beyond the 300-m range, and we currently lack adequate sample size to estimate the effect of living in even closer proximity to the freeway (< 100 m) where high concentrations of PM have been detected. To examine the effects of proximity at closer distances to major roadways, we estimated autism risk among subjects living within 96 m (the top quartile of exposure vs. > 96 m) and among those living within 300 m (corresponding to the region of highest exposure vs. > 300 m) and found slightly elevated non-statistically significant risks (within 96 m: OR = 1.17; 95% CI, 0.80–1.72; within 300 m: OR = 1.19; 95% CI, 0.84–1.68).

The traffic volumes on the classes of other major roadways used in this analysis are likely to be highly variable across California, so exposure to traffic-related pollutants on the spatial scale of interest may be less well classified by residential proximity to other major roadways than by proximity to freeways. For example, we found that the average distance to a freeway among subjects living in the second major road exposure group (42–96 m), with slightly increased risk of autism, was much shorter (mean ± SD = 1,481 ± 1,761 m) than in other major road categories (major road < 42 m, 2,643 ± 2,245 m to freeway; major road 96–209 m, 1,917 ± 3,946 m). Residential traffic proximity has been associated with childhood asthma and lung function growth in previous studies we have conducted in Southern California, and some of these associations have been restricted to freeway proximity or traffic modeled from freeway traffic volume (Gauderman et al. 2005, 2007; McConnell et al. 2006, 2010).

We found little evidence of confounding by the socioeconomic and sociodemographic characteristics included in this analysis. We hypothesized these confounders *a priori* based on literature reporting increased autism rates in higher socioeconomic areas, whereas lower socioeconomic areas are more likely to have higher levels of air pollutants (Sexton et al. 1993). In our study, we observed no difference in level of education in the home among autism cases and controls, and adjusting for these factors had little effect on the traffic and autism association, suggesting that our results were not biased by such factors. In California, clusters of autism tend to have higher levels of parental education, and in countries with highly variable access to health care, diagnosed cases of autism tend to be in families with higher socioeconomic status than the general population; at the same time, controls that participate in studies are almost always of higher socioeconomic status than nonparticipants (Van Meter et al. 2010).

To date, little research has examined the association of air pollutants and autism. Using the U.S. Environmental Protection Agency Hazardous Air Pollutants monitoring network, Windham et al. (2006) identified an increased autism risk with modeled estimates of regional census tract ambient exposure to diesel exhaust particles, as well as metals (mercury, cadmium, and nickel) and chlorinated solvents, in the San Francisco Bay Area of northern California. Additional research using

Table 2. Exposure ORs (95% CIs) for autism, by category of distance from residence to the nearest freeway at time of birth (n = 563).

Exposure category	n (cases/controls)	Crude	Adjusted[a]
< 309 m from freeway (closest 10%)	38/19	1.86 (1.04–3.45)	1.86 (1.03–3.45)
309–647 m from freeway (10th to 25th percentile)	43/41	0.98 (0.60–1.59)	0.96 (0.58–1.56)
647–1,419 m from freeway (25th to 50th percentile)	77/63	1.14 (0.76–1.71)	1.11 (0.73–1.67)
> 1,419 m from freeway (further 50%)	146/136	Reference	Reference

[a]Model was adjusted for child sex (male vs. female), child race/ethnicity (Hispanic vs. white, black/Asian/other vs. white), maximum education of parents (parent with highest of four levels: college degree or higher vs. some high school, high school degree, or some college education), maternal age (> 35 years vs. ≤ 35 years), and maternal smoking during pregnancy (mother reported any smoking during pregnancy vs. mother reported no smoking during pregnancy)

Table 3. Exposure ORs (95% CIs) for autism, by category of distance from residence to the nearest major road at time of birth (n = 563).

Exposure category	n (cases/controls)	Crude	Adjusted[a]
≤ 42 m from major road (closest 10%)	28/30	0.80 (0.45–1.41)	0.71 (0.39–1.26)
42–96 m from major road (10th to 25th percentile)	54/32	1.44 (0.88–2.39)	1.29 (0.77–2.18)
96–209 m from major road (25th to 50th percentile)	71/68	0.89 (0.59–1.34)	0.83 (0.55–1.26)
> 209 m from major road (further 50%)	151/129	Reference	Reference

[a]Model was adjusted for child sex (male vs. female), child race/ethnicity (Hispanic vs. white, black/Asian/other vs. white), maximum education of parents (parent with the highest of four levels: college degree or more education vs. some high school, high school degree, or some college education), maternal age (> 35 years vs. ≤ 35 years), and maternal smoking during pregnancy (mother reported any smoking during pregnancy vs. mother reported no smoking during pregnancy), and freeway distance categories (< 309 m, 309–647 m, 647–1,419 m vs. referent of > 1,419 m).

models from the Hazardous Air Pollutants program found associations between autism and air toxics at the birth residence of children from North Carolina and West Virginia (Kalkbrenner et al. 2010). Our analysis builds on this work by examining associations with individual-level indicators of exposure based on traffic proximity, prenatally and at birth.

Toxicologic studies suggest a biologically plausible role of air pollution in disrupting brain development and function during critical time points in gestation and early life. Diesel exhaust particles present in traffic-related pollution have been shown to have endocrine-disrupting activity and to transplacentally affect sexual differentiation and alter cognitive function in mice (Hougaard et al. 2008; Watanabe and Kurita 2001). Prenatal exposure to ozone in rats has been seen to alter monoamine content in the cerebellum, which may then alter neural circuitry formation (Gonzalez-Pina et al. 2008). Recent work examining the effects of benzo[*a*]pyrene, a common PAH, indicates that prenatal oral exposure in mice results in decreased neuronal plasticity and behavioral deficits (Brown et al. 2007). Specifically, prenatal exposure was associated with reduced glutamate receptor development when synapses are formed. Additionally, exposure to benzo[*a*]pyrene via breast-feeding in mice during the early postnatal period, corresponding to the rapid human brain development taking place during the third trimester, affected neuromaturation as measured by classic developmental behavior tests and to reduce expression of the serotonin receptor 5HT1A (Bouayed et al. 2009; Pan et al. 2009).

Traffic-related air pollutants have been observed to induce inflammation and oxidative stress after both short-term and long-term exposures in toxicologic and human studies, and these pathways are thought to mediate effects of air pollution on respiratory and cardiovascular disease, and perhaps on neurologic outcomes (Block and Calderon-Garcidueñas 2009; Calderon-Garcidueñas et al. 2009; Castro-Giner et al. 2009; Gilliland et al. 2004; Künzli et al. 2010). The emerging evidence that oxidative stress and inflammation are also involved in the pathogenesis of autism may suggest a biologically plausible rationale for the observed associations in our study (Boso et al. 2006; Enstrom et al. 2009a, 2009b; James et al. 2004, 2006, 2009). In particular, research examining serum biomarkers reported increased levels of the proinflammatory cytokines tumor necrosis factor-α, interleukin (IL)-6, IL-8, and colony-stimulating factor II, as well as two markers of T-helper 1 immune response (interferon-γ and IL-8), in postmortem brain tissue of autism cases compared with controls (Li et al. 2009). Additional research from the CHARGE study has shown increased plasma levels of immunoglobulin (Ig) G-4 and reduced concentrations of tumor growth factor-β, related to immune response and inflammatory processes, in plasma of children with autism compared with typically developing controls and children with developmental delay (Ashwood et al. 2008; Enstrom et al. 2009a, 2009b). Other recent work indicates that exposure to air pollution exposure during pregnancy is associated with changes in IgE and in lymphocytes measured from cord blood, supporting the idea that maternal exposure to air pollution is associated with altered immune profiles in the fetus (Herr et al. 2010a, 2010b). Moreover, published evidence links maternal antibodies to fetal brain tissue with a subset of autism cases (Braunschweig et al. 2008).

Genetic variation in oxidative stress and inflammatory pathways has also been associated with autism. Oxidative stress endophenotypes and corresponding genotypes related to metabolism of methionine transmethylation and transsulfuration were significantly decreased in children with autism compared with controls, indicating increased susceptibility to oxidative stress (Boso et al. 2006; James et al. 2004, 2006). Markers of lipid peroxidation have also been associated with autism, as have increased levels of nitric oxide and mitochondrial dysfunction, which may be related to the formation of reactive oxygen species (Chauhan and Chauhan 2006; Filipek et al. 2004; Ming et al. 2005; Sogut et al. 2003; Yao et al. 2006). Polymorphisms in glutathione *S*-transferase mu 1 (*GSTM1*), glutathione *S*-transferase pi 1 (*GSTP1*), and glutathione peroxidase 1 (*GPX1*), which modulate the response to oxidative stress, have been associated with increased autism risk (Buyske et al. 2006; Ming et al. 2009; Williams et al. 2007). These genetic variants have also been shown to modify the association between exposure to air oxidant pollutant associations and respiratory outcomes (Islam et al. 2009; Salam et al. 2007). Examination of the interaction between these oxidant-associated genes and environmental exposures may help to clarify susceptibilities to environmental pollutants among children with autism.

We recognize that the moderate relative risks associated with freeway proximity in our study may have been attributable to chance or bias. The study is currently limited by sample size and potential exposure misclassification. Analysis of larger data sets would provide additional valuable insight into these findings and the potential for replication. Although we used a residential history questionnaire (available for a subset of the study participants) to choose the appropriate address for trimester, there still may be misclassification of exposure in these data due to inaccurate date reporting on the part of the mother, or in our choice among multiple addresses in each trimester. We could not distinguish the potential effect of noise from that due to pollutant exposures, both resulting from residential location near a freeway or other road in this study. Addresses on the birth certificate could also be in error, but this would probably be less likely. We were not able to examine specific pollutant concentrations in this study, and the traffic proximity metrics were subject to misclassification of exposure because they did not account for traffic volume or prevailing wind speed and direction. However, this exposure misclassification was unlikely to have been systematically related to disease, and our results may therefore have underestimated the magnitude of a true causal association.

Despite these limitations, this study has several strengths. We assessed autism through well-validated instruments that are recognized as the gold standard in the field. We examined exposure prenatally and at birth, two pivotal times in gestational development, whereas prior work on air pollution has been limited to the birth address or a cumulative lifetime exposure measure. To our knowledge, these results are the first to show an association of autism with residential traffic proximity.

Conclusions

Little is known about potential environmental contributions to autism. The observed associations with traffic proximity merit further research to determine whether these results are reproducible in populations with improved estimates of exposure to specific ambient air pollutants. Examination of gene–pollution interactions may also help us learn about causal pathways involved in autism and identify potentially susceptible populations and may lead to prevention strategies. Our analysis is the first step in examining a hypothesized relationship between air pollutants and autism. It has been estimated that 11% of the U.S. population lives within 100 m of a four-lane highway, so a causal link to autism or other neurodevelopmental disorders would have broad public health implications (Brugge et al. 2007).

References

Abrahams BS, Geschwind DH. 2008. Advances in autism genetics: on the threshold of a new neurobiology. Nat Rev Genet 9(5):341–355.

American Psychiatric Association. 2000. Diagnostic and Statistical Manual of Mental Disorders. 4th ed, Text Revision. Washington, DC: American Psychiatric Association.

Ashwood P, Enstrom A, Krakowiak P, Hertz-Picciotto I, Hansen RL, Croen LA, et al. 2008. Decreased transforming growth factor beta1 in autism: a potential link between immune dysregulation and impairment in clinical behavioral outcomes. J Neuroimmunol 204(1–2):149–153.

Block ML, Calderon-Garcidueñas L. 2009. Air pollution: mechanisms of neuroinflammation and CNS disease. Trends Neurosci 32(9):506–516.

Bocskay KA, Tang D, Orjuela MA, Liu X, Warburton DP, Perera FP. 2005. Chromosomal aberrations in cord blood are associated with prenatal exposure to carcinogenic polycyclic aromatic hydrocarbons. Cancer Epidemiol Biomarkers Prev 14(2):506–511.

Boso M, Emanuele E, Minoretti P, Arra M, Politi P, Ucelli di Nemi S,

et al. 2006. Alterations of circulating endogenous secretory RAGE and S100A9 levels indicating dysfunction of the AGE-RAGE axis in autism. Neurosci Lett 410(3):169–173.
Bouayed J, Desor F, Rammal H, Kiemer AK, Tybl E, Schroeder H, et al. 2009. Effects of lactational exposure to benzo[alpha]pyrene (B[alpha]P) on postnatal neurodevelopment, neuronal receptor gene expression and behaviour in mice. Toxicology 259(3):97–106.
Braunschweig D, Ashwood P, Krakowiak P, Hertz-Picciotto I, Hansen R, Croen LA, et al. 2008. Autism: maternally derived antibodies specific for fetal brains. Neurotoxicology 29(2):226–231.
Brown LA, Khousbouei H, Goodwin JS, Irvin-Wilson CV, Ramesh A, Sheng L, et al. 2007. Down-regulation of early ionotrophic glutamate receptor subunit developmental expression as a mechanism for observed plasticity deficits following gestational exposure to benzo(a)pyrene. Neurotoxicology 28(5):965–978.
Brugge D, Durant JL, Rioux C. 2007. Near-highway pollutants in motor vehicle exhaust: a review of epidemiologic evidence of cardiac and pulmonary health risks. Environ Health 6:23, doi:10.1186/1476-069X-6-23 [Online 9 August 2007].
Buyske S, Williams TA, Mars AE, Stenroos ES, Ming SX, Wang R, et al. 2006. Analysis of case-parent trios at a locus with a deletion allele: association of GSTM1 with autism. BMC Genet 7:8, doi:10.1186/1471-2156-7-8 [Online 10 February 2006].
Calderon-Garcidueñas L, Macias-Parra M, Hoffmann HJ, Valencia-Salazar G, Henriquez-Roldán C, Osnaya N, et al. 2009. Immunotoxicity and environment: immunodysregulation and systemic inflammation in children. Toxicol Pathol 37(2):161–169.
Caltrans. 2008. Traffic and Vehicle Data Systems Unit: All Traffic Volumes on the California State Highway System. Available: http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2008all.htm [accessed 27 July 2010].
Castro-Giner F, Künzli N, Jacquemin B, Forsberg B, de Cid R, Sunyer J, et al. 2009. Traffic-related air pollution, oxidative stress genes, and asthma (ECHRS). Environ Health Perspect 117:1919–1924.
Centers for Disease Control and Prevention. 2007a. Prevalence of autism spectrum disorders—autism and developmental disabilities monitoring network, 14 sites, United States, 2002. MMWR Surveill Summ 56(1):12–28.
Centers for Disease Control and Prevention. 2007b. Prevalence of autism spectrum disorders—autism and developmental disabilities monitoring network, six sites, United States, 2000. MMWR Surveill Summ 56(1):1–11.
Centers for Disease Control and Prevention. 2009. Prevalence of autism spectrum disorders—autism and developmental disabilities monitoring network, United States, 2006. MMWR Surveill Summ 58(10):1–20.
Chauhan A, Chauhan V. 2006. Oxidative stress in autism. Pathophysiology 13(3):171–181.
Currie J, Neidell M, Schmieder JF. 2009. Air pollution and infant health: lessons from New Jersey. J Health Econ 28(3):688–703.
Enstrom A, Krakowiak P, Onore C, Pessah IN, Hertz-Picciotto I, Hansen RL, et al. 2009a. Increased IgG4 levels in children with autism disorder. Brain Behav Immun 23(3):389–395.
Enstrom AM, Lit L, Onore CE, Gregg JP, Hansen RL, Pessah IN, et al. 2009b. Altered gene expression and function of peripheral blood natural killer cells in children with autism. Brain Behav Immun 23(1):124–133.
Filipek PA, Juranek J, Nguyen MT, Cummings C, Gargus JJ. 2004. Relative carnitine deficiency in autism. J Autism Dev Disord 34(6):615–623.
Gauderman WJ, Avol E, Lurmann F, Kuenzli N, Gilliland F, Peters J, et al. 2005. Childhood asthma and exposure to traffic and nitrogen dioxide. Epidemiology 16(6):737–743.
Gauderman WJ, Vora H, McConnell R, Berhane K, Gilliland F, Thomas D, et al. 2007. Effect of exposure to traffic on lung development from 10 to 18 years of age: a cohort study. Lancet 369(9561):571–577.
Gilliland FD, Li YF, Saxon A, Diaz-Sanchez D. 2004. Effect of glutathione-*S*-transferase M1 and P1 genotypes on xenobiotic enhancement of allergic responses: randomised, placebo-controlled crossover study. Lancet 363(9403):119–125.
Gonzalez-Pina R, Escalante-Membrillo C, Alfaro-Rodriguez A, Gonzalez-Maciel A. 2008. Prenatal exposure to ozone disrupts cerebellar monoamine contents in newborn rats. Neurochem Res 33(5):912–918.
Hansen CA, Barnett AG, Pritchard G. 2008. The effect of ambient air pollution during early pregnancy on fetal ultrasonic measurements during mid-pregnancy. Environ Health Perspect 116:362–369.
Herr CEW, Dostal M, Ghosh R, Ashwood P, Lipsett M, Pinkerton KE, et al. 2010b. Air pollution exposure during critical time periods in gestation and alterations in cord blood lymphocyte distribution: a cohort of livebirths. Environ Health 9:46; doi:10.1186/1476-069X-9-46 [Online 2 August 2010].
Herr CEW, Ghosh R, Dostal M, Skokanova V, Ashwood P, Lipsett M, et al. 2010a. Exposure to air pollution in critical prenatal time windows and IgE levels in newborns. Pediatr Allergy Immunol; doi: 10.1111/j.1399-3038.2010.01074.x [Online 1 July 2010].
Hertz-Picciotto I, Croen LA, Hansen R, Jones CR, van de Water J, Pessah IN. 2006. The CHARGE study: an epidemiologic investigation of genetic and environmental factors contributing to autism. Environ Health Perspect 114:1119–1125.
Hertz-Picciotto I, Delwiche L. 2009. The rise in autism and the role of age at diagnosis. Epidemiology 20(1):84–90.
Hougaard KS, Jensen KA, Nordly P, Taxvig C, Vogel U, Saber AT, et al. 2008. Effects of prenatal exposure to diesel exhaust particles on postnatal development, behavior, genotoxicity and inflammation in mice. Part Fibre Toxicol 5:3; doi:10.1186/1743-8977-5-3 [Online 11 March 2008].
Islam T, Berhane K, McConnell R, Gauderman WJ, Avol E, Peters JM, et al. 2009. Glutathione-*S*-transferase (GST) P1, GSTM1, exercise, ozone and asthma incidence in school children. Thorax 64(3):197–202.
James SJ, Cutler P, Melnyk S, Jernigan S, Janak L, Gaylor DW, et al. 2004. Metabolic biomarkers of increased oxidative stress and impaired methylation capacity in children with autism. Am J Clin Nutr 80(6):1611–1617.
James SJ, Melnyk S, Jernigan S, Cleves MA, Halsted CH, Wong DH, et al. 2006. Metabolic endophenotype and related genotypes are associated with oxidative stress in children with autism. Am J Med Genet B Neuropsychiatr Genet 141B(8):947–956.
James SJ, Rose S, Melnyk S, Jernigan S, Blossom S, Pavliv O, et al. 2009. Cellular and mitochondrial glutathione redox imbalance in lymphoblastoid cells derived from children with autism. FASEB J 23(8):2374–2383.
Kalkbrenner AE, Daniels JL, Chen JC, Poole C, Emch M, Morrissey J. 2010. Perinatal exposure to hazardous air pollutants and autism spectrum disorders at age 8. Epidemiology 21(5):631–641.
King M, Bearman P. 2009. Diagnostic change and the increased prevalence of autism. Int J Epidemiol 38(5):1224–1234.
Künzli N, Jerrett M, Garcia-Esteban R, Basagana X, Beckermann B, Gilliland F, et al. 2010. Ambient air pollution and the progression of atherosclerosis in adults. PLoS One 5(2):e9096.
Le Couteur A, Lord C, Rutter M. 2003. Autism Diagnostic Interview–Revised (ADI-R). Los Angeles:Western Psychological Services.
Li X, Chauhan A, Sheikh AM, Patil S, Chauhan V, Li XM, et al. 2009. Elevated immune response in the brain of autistic patients. J Neuroimmunol 207(1–2):111–116.
Lord C, Rutter M, DiLavore P, Risi S. 2003. Autism Diagnostic Observation Schedule Manual. Los Angeles:Western Psychological Services.
Ma D, Salyakina D, Jaworski JM, Konidari I, Whitehead PL, Anderson AN, et al. 2009. A genome-wide association study of autism reveals a common novel risk locus at 5p14.1. Ann Hum Genet 73(pt 3):263–273.
McConnell R, Berhane K, Yao L, Jerrett M, Lurmann F, Gilliland F, et al. 2006. Traffic, susceptibility, and childhood asthma. Environ Health Perspect 114:766–772.
McConnell R, Islam T, Shankardass K, Jerrett M, Lurmann F, Gilliland F, et al. 2010. Childhood incident asthma and traffic-related air pollution at home and school. Environ Health Perspect 118:1021–1026.
Ming X, Johnson WG, Stenroos ES, Mars A, Lambert GH, Buyske S. 2009. Genetic variant of glutathione peroxidase 1 in autism. Brain Dev 32(2):105–109.
Ming X, Stein TP, Brimacombe M, Johnson WG, Lambert GH, Wagner GC. 2005. Increased excretion of a lipid peroxidation biomarker in autism. Prostaglandins Leukot Essent Fatty Acids 73(5):379–384.
Morales E, Julvez J, Torrent M, de Cid R, Guxens M, Bustamante M, et al. 2009. Association of early-life exposure to household gas appliances and indoor nitrogen dioxide with cognition and attention behavior in preschoolers. Am J Epidemiol 169(11):1327–1336.
Muhle R, Trentacoste SV, Rapin I. 2004. The genetics of autism. Pediatrics 113(5):e472–e486.
Mullen E. 1995. Mullen Scales of Early Learning. Circle Pines, MN:American Guidance Services Inc.
Pan IJ, Daniels JL, Goldman BD, Herring AH, Siega-Riz AM, Rogan WJ. 2009. Lactational exposure to polychlorinated biphenyls, dichlorodiphenyltrichloroethane, and dichlorodiphenyldichloroethylene and infant neurodevelopment: an analysis of the pregnancy, infection, and nutrition babies study. Environ Health Perspect 117:488–494.
Perera FP, Rauh V, Tsai WY, Kinney P, Camann D, Barr D, et al. 2003. Effects of transplacental exposure to environmental pollutants on birth outcomes in a multiethnic population. Environ Health Perspect 111:201–205.
Perera FP, Rauh V, Whyatt RM, Tsai WY, Bernert JT, Tu YH, et al. 2004. Molecular evidence of an interaction between prenatal environmental exposures and birth outcomes in a multiethnic population. Environ Health Perspect 112:626–630.
Perera FP, Rauh V, Whyatt RM, Tsai WY, Tang D, Diaz D, et al. 2006. Effect of prenatal exposure to airborne polycyclic aromatic hydrocarbons on neurodevelopment in the first 3 years of life among inner-city children. Environ Health Perspect 114:1287–1292.
Perera FP, Tang D, Rauh V, Tu YH, Tsai WY, Becker M, et al. 2007. Relationship between polycyclic aromatic hydrocarbon–DNA adducts, environmental tobacco smoke, and child development in the World Trade Center cohort. Environ Health Perspect 115:1497–1502.
Ritz B, Yu F. 1999. The effect of ambient carbon monoxide on low birth weight among children born in Southern California between 1989 and 1993. Environ Health Perspect 107:17–25.
Rutter M, Bailey A, Lord C. 2003. A Social Communication Questionnaire (SCQ). Los Angeles:Western Psychological Services.
Salam MT, Lin PC, Avol EL, Gauderman WJ, Gilliland FD. 2007. Microsomal epoxide hydrolase, glutathione *S*-transferase P1, traffic and childhood asthma. Thorax 62(12):1050–1057.
Sexton K, Gong H Jr, Bailar JC III, Ford JG, Gold DR, Lambert WE, et al. 1993. Air pollution health risks: do class and race matter? Toxicol Ind Health 9(5):843–878.
Sogut S, Zoroglu SS, Ozyurt H, Yilmaz HR, Ozuguru F, Sivasli E, et al. 2003. Changes in nitric oxide levels and antioxidant enzyme activities may have a role in the pathophysiological mechanisms involved in autism. Clin Chim Acta 331(1–2):111–117.
Sparrow S, Cicchettim D, Balla D. 1984. Vineland Adaptive Behavior Scales Interview Edition Expanded Form Manual. Circle Pines, MN:American Guidance Services Inc.
Suglia SF, Gryparis A, Wright RO, Schwartz J, Wright RJ. 2008. Association of black carbon with cognition among children in a prospective birth cohort study. Am J Epidemiol 167(3):280–286.
Van Meter KC, Christiansen LE, Delwiche LD, Azari R, Carpenter TE, Hertz-Picciotto I. 2010. Geographic distribution of autism in California: a retrospective birth cohort analysis. Autism Res 3(1):19–29.
Vassilev ZP, Robson MG, Klotz JB. 2001. Outdoor exposure to airborne polycyclic organic matter and adverse reproductive outcomes: a pilot study. Am J Ind Med 40(3):255–262.
Wang K, Zhang H, Ma D, Bucan M, Glessner JT, Abrahams BS, et al. 2009. Common genetic variants on 5p14.1 associate with autism spectrum disorders. Nature 459(7246):528–533.
Watanabe N, Kurita M. 2001. The masculinization of the fetus during pregnancy due to inhalation of diesel exhaust. Environ Health Perspect 109:111–119.
Williams TA, Mars AE, Buyske SG, Stenroos ES, Wang R, Factura-Santiago MF, et al. 2007. Risk of autistic disorder in affected offspring of mothers with a glutathione *S*-transferase P1 haplotype. Arch Pediatr Adolesc Med 161(4):358–361.
Windham GC, Zhang L, Gunier R, Croen LA, Grether JK. 2006. Autism spectrum disorders in relation to distribution of hazardous air pollutants in the San Francisco Bay Area. Environ Health Perspect 114:1438–1444.
Yao Y, Walsh WJ, McGinnis WR, Pratico D. 2006. Altered vascular phenotype in autism: correlation with oxidative stress. Arch Neurol 63(8):1161–1164.
Zhu Y, Hinds WC, Kim S, Sioutas C. 2002. Concentration and size distribution of ultrafine particles near a major highway. J Air Waste Manag Assoc 52(9):1032–1042.
Zhu Y, Kuhn T, Mayo P, Hinds WC. 2006. Comparison of daytime and nighttime concentration profiles and size distributions of ultrafine particles near a major highway. Environ Sci Technol 40(8):2531–2536.

EXHIBIT 6

Atmospheric Environment xxx (2016) xxx-xxx

Contents lists available at ScienceDirect

Atmospheric Environment

journal homepage: www.elsevier.com

Transition metals in coarse, fine, very fine and ultra-fine particles from an interstate highway transect near Detroit

Thomas A. Cahill [a, *], David E. Barnes [a], Jonathan A. Lawton [a], Roger Miller [a], Nicholas Spada [b], Robert D. Willis [c], Sue Kimbrough [d]

[a] DELTA Group, University of California, Davis, CA 95616, USA
[b] University of Houston, Houston, TX, USA
[c] US Environmental Protection Agency, National Exposure Research Laboratory, Research Triangle Park, NC 27711, USA
[d] US Environmental Protection Agency, National Risk Management Research Laboratory, Research Triangle Park, NC 27711, USA

ARTICLE INFO

Article history:
Received 17 June 2016
Received in revised form 5 September 2016
Accepted 12 September 2016
Available online xxx

Keywords:
Aerosols
Highway
Size profiles
Lateral transects
Ultra fine metals

ABSTRACT

As one component of a study investigating the impact of vehicle emissions on near-road air quality, human exposures, and potential health effects, particles were measured from September 21 to October 30, 2010 on both sides of a major roadway (Interstate-96) in Detroit. Traffic moved freely on this 12 lane freeway with a mean velocity of 69 mi/hr. with little braking and acceleration. The UC Davis DELTA Group rotating drum (DRUM) impactors were used to collect particles in 8 size ranges at sites nominally 100 m south, 10 m north, 100 m north, and 300 m north of the highway. Ultra-fine particles were continuously collected at the 10 m north and 100 m north sites. Samples were analyzed every 3 h for mass (soft beta ray transmission), 42 elements (synchrotron-induced x-ray fluorescence) and optical attenuation (350–800 nm spectroscopy). A three day period of steady southerly winds along the array allowed direct measurement of freeway emission rates for coarse ($10 > D_p > 1.0$ μm), $PM_{2.5}$, very fine ($0.26 > D_p > 0.09$ μm), and ultra-fine ($D_p < 0.09$ μm) particles. The $PM_{2.5}$ mass concentrations were modeled using literature emission rates during the south to north wind periods, and averaged 1.6 ± 0.5 μg/m^3, versus the measured value of 2.0 ± 0.7 μg/m^3. Using European freeway emission rates from 2010, and modeling them at the I-96 site, we would predict roughly 3.1 μg/m^3 of $PM_{2.5}$ particles, corrected from the 4.9 PM_{10} value by their measured road dust contributions. Using California car and truck emission rates of 1973, this value would have been about 16 μg/m^3, corrected down from the 19 μg/m^3 $PM_{5.0}$ using measured roadway dust contributions. This would have included 2.7 μg/m^3 of lead, versus the 0.0033 μg/m^3 measured. Very fine particles were distributed across the array with a relatively weak falloff versus distance. For the ultra-fine particles, emissions of soot and metals seen in vehicular braking studies correlated with traffic at the 10 m site, but only the soot was statistically significant at the 100 m north site. Otherwise, the 10 m north and 100 m north sites were essentially identical in mean concentration and highly correlated in time for most of the 5 week study. This result supports earlier publications showing the ability of very fine and ultra-fine particles to transport to sites well removed from the freeway sources. The concentrations of very fine and ultra-fine metals from brake wear and zinc in motor oil observed in Detroit have the potential of being a significant component in statistically established $PM_{2.5}$ mortality rates.

1. Introduction

Enormous advances have been made in the past 40 years in reducing particulate pollutants from highway vehicles, including the elimination of lead from gasoline. Additionally, important advances have been made in reducing emissions from diesel trucks by improved engine design, low-sulfur fuels, and especially diesel particulate filters. However, studies show that highways continue to be a source of both coarse and fine particulate matter (PM) including known toxics such as diesel exhaust (Zhu et al., 2002; Karner et al., 2010; Cahill and Cahill, 2013). In addition, particles associated from vehicular wear such as from brake pads and drums are currently roughly equal to tailpipe emissions and are on track to exceed tail pipe emissions in the near future (Denier Van der Gon et al., 2013). Only limited data are available on wear particles by size and composition, but a major source is known to be ultra-fine metals from abrasion of brake pads and drums (Cahill et al., 2014).

In vitro laboratory studies of nanoparticles raise concerns about the health impacts of highway emissions, especially very fine and ultra-fine metals due to their propensity for penetrating to the deepest portions of the lung and diffusing into the circulatory system (Lewis et al., 2005; Chen and Lippmann, 2009; Lippmann, 2009; Oberdorster et al., 2007; Denier Van der Gon et al., 2013). Additionally, epidemiological health studies continue to show that highway emissions are damaging to both pulmonary and cardiovascular systems of people living near highways (Cahill et al., 2011), with reduced lung function in children (Peters et al., 1999a,b); Gauderman et al., 2000; HEI, 2009; Lin and Peng, 2010; Karner et al., 2010). These data have been combined with data on the health impacts of roadway pollutants, including potential cancer impacts largely from diesel exhaust, and used to generate estimated health impacts in models such as Emfac2007 (ARB, 2007).

* Corresponding author.
Email address: tomandginny12@gmail.com (T.A. Cahill)

http://dx.doi.org/10.1016/j.atmosenv.2016.09.023
1352-2310/

A recent European survey noted that wear particles were approaching and would soon surpass exhaust particles near roadways, with uncertain health impacts. Their consensus statement concludes, "In light of the continuous increase of the relative contribution of non-exhaust emission to ambient PM, where it is becoming the dominant emission process for urban transport, it is more than timely to devote greater efforts to properly quantifying non-exhaust emissions and assessing health relevance." (Denier Van der Gon et al., 2013).

The U.S. Environmental Protection Agency (EPA) and the University of Michigan conducted the Near-road Exposures to Urban Air Pollutants Study (NEXUS) – a research project to study the impact of vehicle emissions on near-road air quality, human exposures, and potential health effects. Components of NEXUS include but are not limited to human exposures in near-road residences (Vette et al., 2013), studies of near roadway allergic impacts in mice (McGee et al., 2015). The NEXUS aerosol component reported in this publication was designed and conducted to update our information on highway emissions and their potential human impact with a component on vehicular wear emissions.

1.1. Experimental methodologies

1.1.1. Sampling array

Particles were measured from September 21 to October 30, 2010 on both sides of the Interstate 96 freeway 9 miles west of downtown Detroit. The I-96 monitoring location was established as part of a collaborative research study conducted by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Transportation Federal Highway Administration (FHWA) (US EPA, 2013). The test section was a 12-lane section of I-96 with an at-grade roadway configuration aligned east to west. Obstructions from vegetation between the test array of four sites, which extended from 100 m south of the highway to 300 m north of the highway, were negligible, as seen in Fig. 1. As part of NEXUS, additional PM monitoring was conducted at these sites.

Particles were collected in 8 size ranges at sites 100 m south, 10 m north, 100 m north, and 300 m north of the highway, while ultra-fine particles were continuously collected at the 10 m north and 100 m north sites. (Table 1)All sampling sites were on the top of trailers or one-story buildings with minimal obstructions (approximately 4 m from ground to inlets). The exception was the 100 m south site that had heavy trees south of the site, which did not obstruct the air flow from the highway.

1.1.2. Weather

Wind direction and wind speed were measured continuously at the 100 m north site (Fig. 2). During most of the study winds were weak, and extensive periods of calms occurred, especially at night. Wind directions were most frequent from the northwest (315°) through north northeast (35°). Given the southeast to northwest orientation of the sampling array, an upwind/downwind analysis of I-96 traffic emissions is best conducted when winds are from the southeast to southwest sector.

Thus, in order to address the prime goal of the study, a small fraction of the entire five-week period was chosen for which there was a clean upwind-downwind profile along the array. Since the goal was to quantify aerosol transport downwind of the freeway, results were limited to periods when the upwind-downwind trajectory was within ±67° of the north-south axis across the east-west freeway with wind speeds >1 km/hr. Periods of extreme wind or rain events were excluded as well as wind trajectories pointing back to strong upwind sources such as the Monroe coal-fired power plant.

In terms of duration, while any 3 h period provides a valid signature in time, the ideal is several days in a row. The reasons include reducing the inherent 1½ hr uncertainty in the elemental data set by the width of the x-ray analysis microprobe to roughly 30 min, which al-

Fig. 1. Monitoring site transect array across I-96 west of Detroit established for the EPA/FHWA National Near Road Study and used as a component of the NEXUS study. I-96 runs east-west and Telegraph Road is the multi lane road running north-south to the west of the sampling sites.

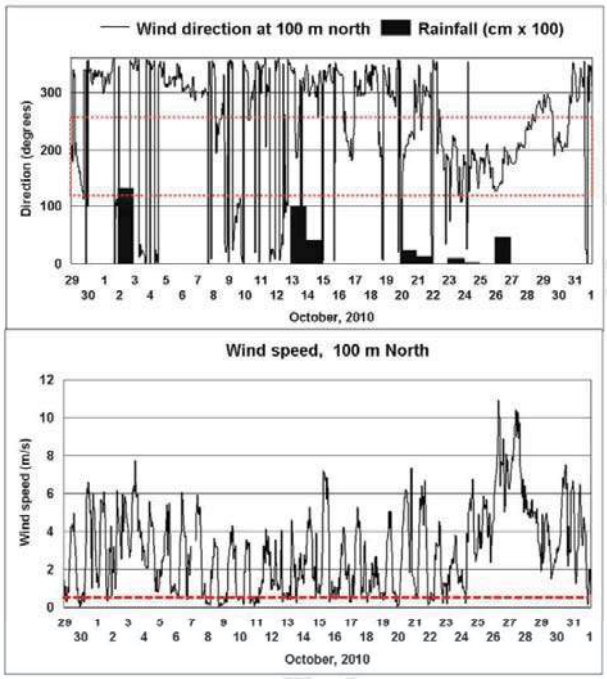


Fig. 2. a) Wind direction and rainfall, and b) wind speed, with the dotted box showing the periods with the wind from the south, 180° ± 67°, measured at the 100 m north site. Data below the dashed line are calm periods with wind speed <1.0 km/hr.

lows better accord with meteorology and traffic patterns. It also allows better sensitivity by summing the periods for averaging actions such as size profiles. Limiting the intensive to week days avoided the complexity of highly variable weekend conditions, especially in terms of the truck traffic.

1.2. Experimental techniques

1.2.1. Sample collection

The primary aerosol collection instrument was the UC Davis DELTA Group rotating drum (DRUM) impactor (Cahill et al., 1985; Raabe et al., 1988;) delivering aerosol samples in 8 size ranges: 10 to 5.0, 5.0 to 2.5, 2.5 to 1.15, 1.15 to 0.75, 0.75 to 0.56, 0.56 to 0.34, 0.34 to 0.26 and 0.29 to 0.09 μm aerodynamic diameter. Samples were impacted at the rate of 4 mm/day onto 168 mm long, lightly greased Mylar foils, which were then transferred to plastic frames for analyses. Excellent agreement ($r^2 = 0.99$, slope = 0.99 ± 0.011, and intercept = 14 ng/m^3) was seen in a side by side comparison of the DRUM mass (summed over all stages including ultra-fines) versus a California Air Resources Board $PM_{2.5}$ Federal Reference Monitor (Cahill et al., 2014; Nichols, 2009, Supplemental Materials A).

For this study, a newly developed continuous ultra-fine stage was added at the 10 m north and 100 m north sites. These allow continuous collection of ultra-fine (<0.09 μm) particles directly after the last stage of the DRUM and keyed to deliver a stretched Teflon filter strip exactly matching in time the rotating drum stages (Cahill and Barnes, 2009).

1.2.2. Sample analysis

Details of the accuracy and precision of the mass, optical, and elemental analyses of the DRUM are included in Supplemental Materials. The measurements were made in 3 h increments using 500 μm wide excitation sources, and included:

- Mass (soft beta ray transmission, Ni^{63} source, MDL = 0.7 μg/m^3).
- Elements sodium through molybdenum, plus lead (Synchrotron-induced X-Ray Fluorescence (S-XRF), MDLs typically ~ 0.1 ng/m^3).
- Diesel soot (optical attenuation, 380–820 nm, 50 nm bites, Ocean Optics spectrophotometer).

1.3. Black carbon data

Measurements of black carbon were also collected at the I-96 sites based on optical absorption (880 nm) using a Magee Scientific rack mount aethalometer (US EPA, 2013) and were compared to the DRUM optical attenuation.

1.4. Traffic data

Traffic volume during the study period showed a highly reproducible weekly pattern (Fig. 3). Weekday traffic averaged 175,000 cars and light trucks/day along with 12,000 heavy-duty trucks/day, or 6.6% trucks. Weekend traffic averaged 110,000 cars and light trucks/day, and about 3% trucks. Traffic data were collected as part of the EPA/FHWA study in 5 min increments individually for each of the 12 traffic lanes and for 6 classes of vehicle by length: 10 ft. (3 m), 30 ft. (9 m), 40 ft. (12 m), 50 ft. (15 m), 60 ft. (18 m), and 70 ft. (21 m) to 80 ft. (24.2 m), the maximum length allowed (US EPA, 2013). Traffic moved freely on the test section during the study, with a mean speed of 69 ± 3 miles/hr (110 ± 5 km/hr), with little braking activity. Below we plot the data reduced to one hour averages over all 12 lanes, using the 10 ft. (3 m) and 30 ft. (9 m) categories for cars and pickup trucks (light-duty vehicles or LDVs, mostly gasoline powered) and 40 ft. (12 m) to 70 ft. (24.2 m) for heavy trucks (mostly diesel). The very strong morning and afternoon peaks seen in the light duty vehicle (LDV) data is much less pronounced in the truck data, which tends to be more uniform all day. Traffic data were not available before Sep. 29.

1.5. Results of the 5-week study

The meteorology encountered during most of the study resulted in aerosol concentrations that, even at the close-in 10 m north site, displayed little or no correlation with the local traffic volume (Fig. 3). In Figs. 4–10 below we show four examples of typically regional particles and three examples of particles likely to have local roadway influence. Regional particles include PM_{10} and $PM_{2.5}$ mass, silicon (soil), sulfur (sulfates) and fine potassium (wood smoke). Particles with known roadway sources include zinc in coarse mode

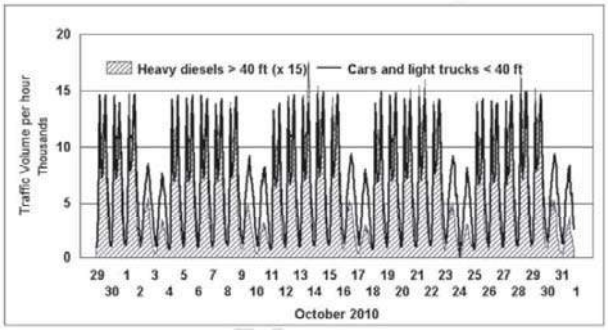


Fig. 3. Traffic measured on I-96 west of Detroit on the EPA/FHWA National Near Road Study site. Heavy diesel truck numbers are scaled by a factor of 15 to facilitate comparison. Weekends occurred on Sept. 25–26, Oct. 2–3, Oct. 9–10, Oct. 16–17, Oct. 23–24, and Oct. 30–31.

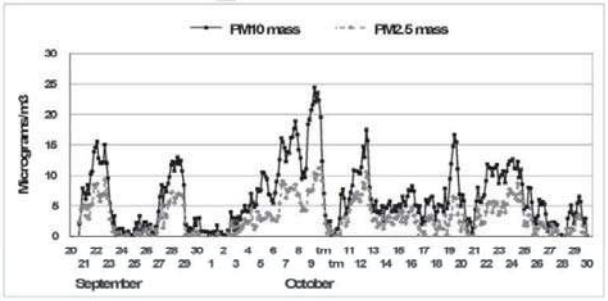


Fig. 4. PM_{10} and $PM_{2.5}$ mass (without ultra-fines < 0.09 μm), at the 10 m north site. Each data point represents a 3 h measurement. The notation "tm" denotes a 6 mm long integral blank for timing and background subtraction validation.

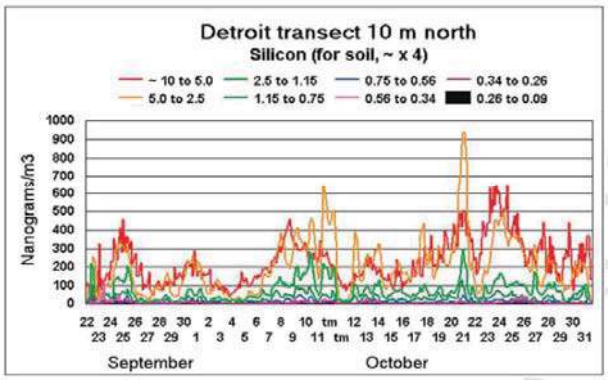


Fig. 5. Silicon from 10 to 0.09 μm derived from soil. The notation "tm" denotes a 6 mm long integral blank for timing and background.

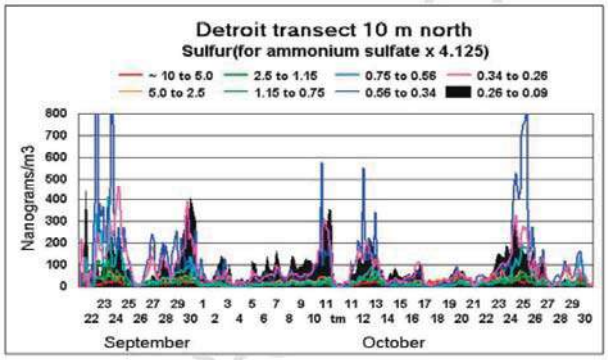


Fig. 6. Sulfur (for sulfate, x 3.0) at 10 m north.

(5.0–1.15 μm) from tire wear, zinc in the very fine mode ($0.26 > D_p > 0.09$ μm) from motor oil combustion, and black carbon (diesel soot) (Malm et al., 1994; Supplemental Materials 1).

Zinc is seen routinely both in transects from the roadway and in the ambient atmosphere. Zinc at the 10 m north site was highly variable in concentration, with highest concentrations typically occurring when the site was upwind of I-96. Note that unlike the potassium in Fig. 7, there are strong sources of coarse zinc not associated with the very fine zinc. Since there were no known sources close to the NEXUS site, the calculated rate of settling favors regional industrial processes with stack emissions.

Optical absorption was measured by two very different techniques, namely light transmission through the DRUM Mylar foils using a multi-wavelength optical spectrometer (Fig. 9), and direct measurement of optical absorption (b_{abs}) from an aethalometer (Fig. 10; data provided by the EPA). The average b_{abs} in units of ng/m^3 of Black Carbon (BC ≅ soot) for the entire period was 648 ng/m^3 at 100 m south, 1014 ng/m^3 at 10 m north, 638 ng/m^3 at 100 m north, 438 ng/m^3 at 300 m north, showing the impact of soot from the freeway.

1.6. Results of the 3-day intensive

The conclusion from the aethalometer data is that even close to the freeway, regional sources are a major factor compared to roadway particles for much of the five week study. Thus, for the remainder of this report, we will focus on those periods during which the criteria for a clean upwind-downwind profile were achieved. The results of the transects can then be compared to the regional particles seen during the entire study, isolating roadway impacts.

In order to identify those periods that met these criteria, nonparametric trajectory analysis (NTA) was performed using the meteorological data collected at the 100 m north site (Henry et al., 2011).

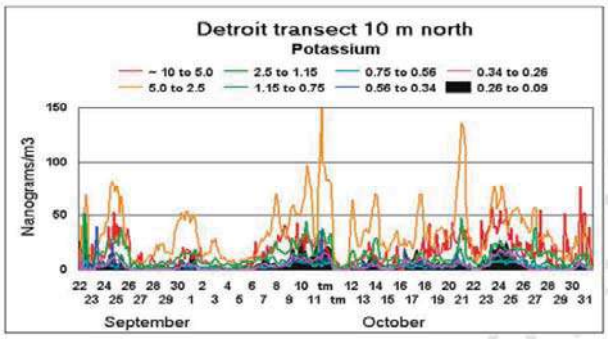


Fig. 7. Potassium at 10 m north, with coarse modes derived from soil and fine modes largely from wood smoke and industrial combustion processes.

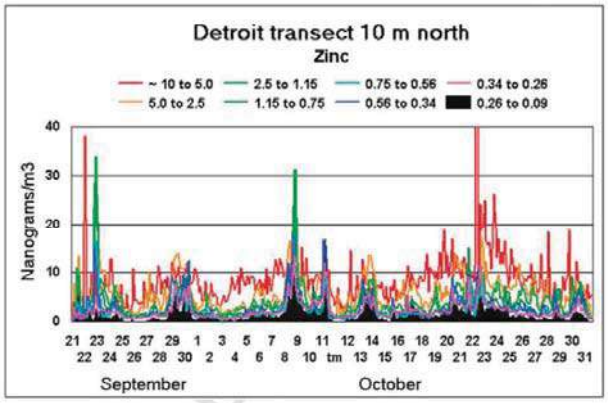


Fig. 8. Zinc from 10 μm to 0.09 μm at 10 m north.

Hourly averaged met data were aggregated into 3 h averages to better match the 3 h aerosol data. Fig. 11 shows the fraction of time in each 3 h period when the wind was blowing across I-96 from the south to the north. Upon early analysis of the data, an additional criterion was added, namely avoidance of sulfur (MDL = 5 ng/m^3) and selenium-rich (Se and As, MDL = 0.1 ng/m^3) particles transported by SSE winds that passed over the Ford Rouge River complex, other industrial sources, and the large Monroe coal fired power plant 34 miles (54 km) south (185°) of the array (Fig. 6). This eliminated the potential October 25 day, while October 23 and 24 were both weekend days and impacted by upwind aerosol sources. October 30 was also eliminated as a weekend day. Although October 8 and 20 met the trajectory criteria, both had extended periods of calm winds making clean upwind-downwind analysis uncertain. A final criterion for the upwind-downwind study was that the 10 m north site should be minimally impacted by Telegraph Road, a multi lane road west of the I-96 sites (Fig. 1). Fig. 12 shows the subset of trajectories for which the 10 m north site was downwind of I-96 and without significant influence from Telegraph Road.

Although there was some influence of Telegraph Road traffic on Oct. 27 and 28 at the 10 m north site, the distance to Telegraph road was much farther than at the 100 m north site and a belt of trees in a residential neighborhood interfered with wind and aerosol transport. (Fig. 1). Also, Telegraph Road traffic volume was a tiny fraction of I-96 traffic volume. For these reasons, the impact should be small, confirmed by the low aethalometer soot readings (Fig. 13 below). The 300 m north site, on the other hand, is much closer to Telegraph Road and was probably significantly impacted by Telegraph Road traffic for much of the study period. The longest period during the NEXUS campaign that met all criteria for a north-south transect occurred from Oct 26 through Oct. 28, 24–3 h periods, shown in the dashed box in Fig. 11.

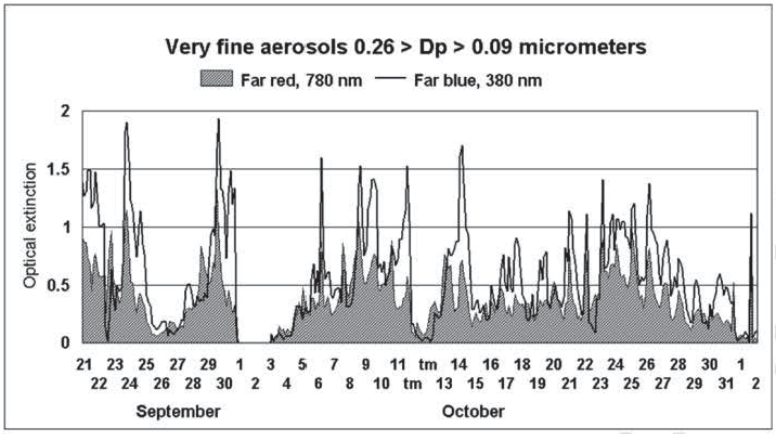


Fig. 9. Optical extinction at two wavelengths for very fine particles at the 10 m north site.

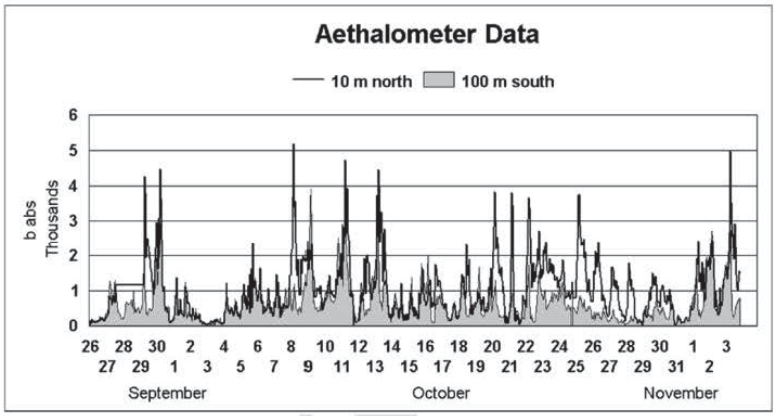


Fig. 10. Optical absorption (b_{abs}) from an aethalometer at both 10 m north and 100 m south.

The wind speed for the 3-day intensive averaged 10.7 ± 3.0 km/hr, and the average direction was SSW, 208 ± 43°. However, the 10 m north site was in the turbulent mixed zone of the northernmost lane of the freeway, as evidenced by the winds from passing trucks. Thus, this site was impacted by one lane of the freeway under most wind conditions, representing only a small fraction of all traffic volume on the 12 lane freeway.

1. Validation of the meteorological analysis

Validation of the Oct. 26–28 choice for the upwind-downwind study was obtained by correlation of soot and typical roadway particles with the daily daytime traffic maxima as shown in Figs. 13 and 14.

The days chosen for the intensive are in the dotted box area. Data are from the 10 m north site.

During the intensive period, the calcium (roadbed abrasion) and iron (vehicle "wear") particles (Fig. 14a and b) are correlated with traffic volume (Fig. 14d), with daytime peaks and nighttime low values, unlike during most of the prior sampling period. Both elements are strongly enhanced over Earth crustal average, calcium by a factor of 5, and iron by a factor of 10, suggesting resuspension of roadbed concrete erosion and vehicle "wear" particles by wind and vehicular turbulence. There was almost no braking of vehicles during the study, so concentrations of the very fine Fe, Ni, Cu and Zn particles characteristic of braking (Cahill et al., 2014) are limited.

Highway zinc coarse particles (Fig. 14c) are enhanced by the zinc in tires and brake wear, while fine and ultra-fine zinc are observed in both brake wear and the burning of the zinc thiophosphate stabilizer used in many motor and lubricating oils, including diesels (Zielinska et al., 2003).

2. Size profiles of the elements

Fig. 15a, b and c plot particle size distributions during the intensive for crustal species (a), transition metals and lead (b) and sulfur (c). The mean size distributions for crustal elements peak in the supra-micron particles, indicating a mechanical source, such as mechanical wear and resuspension of contaminated soils. Iron is very interesting, as it peaks in the 2.5–5.0 μm mode but in concentrations far in excess of what would be expected in soil.

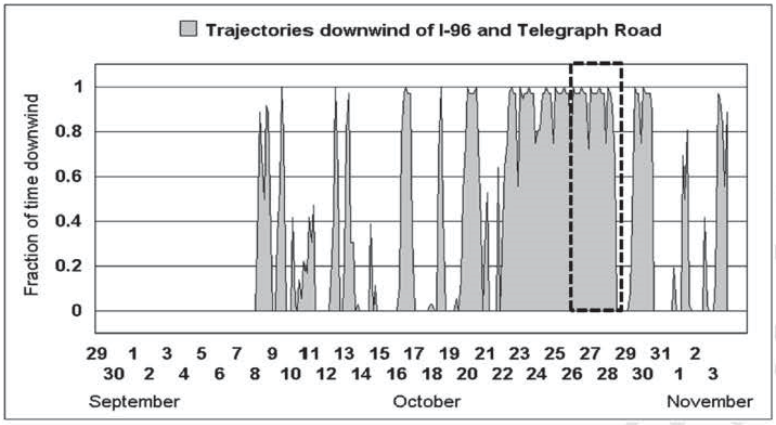


Fig. 11. Trajectory analysis for the 100 m north site isolating those periods when the northern sites were approximately downwind of I-96 and the 100 m south site was a clean upwind background site. The period chosen for the intensive is shown in the dashed box, October 26 through October 28.

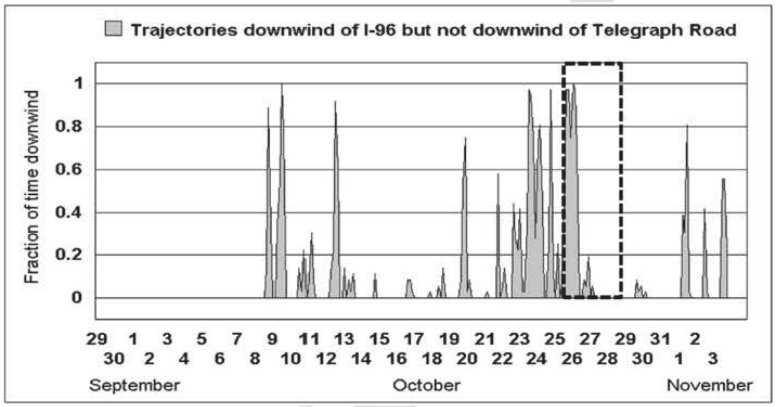


Fig. 12. Trajectory analysis isolating those periods when the 100 m south site was a clean upwind background for 100 m north. The 10 m north site had less Telegraph Road interference.

Size distributions for transition metals (Fig. 15b) also peak in the supra-micron range. Iron (brake drums and rust), copper (brake pads), zinc (stabilizing agent in lube oil, tire wear), and lead ("legacy lead" from past emissions) are known to be associated with traffic (Cahill et al., 2011). Note that in addition to a coarse mode (re-suspended road dust), zinc, lead and copper also exhibit an ultra-fine mode. Very fine and ultra-fine zinc is most likely associated with lubricating oil.

A very different profile is shown for sulfur (Fig. 15c). Typically the accumulation mode around 0.5 μm represents regional ammonium sulfate, while very fine and ultra-fine sulfate has local combustion origins, including from diesel combustion in trucks and cars.

3. Transects in the three day intensive: Coarse ($5.0 > D_p > 2.5$) particles – experimental

For the time-resolved coarse particles, we used only part of the distribution since the time resolution of the coarsest DRUM stage, 10 to 5.0 μm, was large enough to blur the day/night differences. (Supplemental Materials B).

Results of the highway transect (Fig. 16) show highest concentrations at the near freeway site at 10 m north, supporting traffic-derived sources. Concentrations fall off from the roadway to 100 m north, but concentrations of the coarsest particles increase again at 300 m north, especially for crustal species. The presence of the heavily traveled Telegraph Road approximately 380 m west of the 300 m site (Fig. 1) as well as local exposed soils near the site might be contributory factors. In addition, the sampler inlet cut point may have been raised by an estimated 10% due to a non-standard, slightly wider inlet slot. This effect disappeared for the $PM_{2.5}$ particles which are not influenced by coarse local soils.

4. Transects in the three day intensive: Coarse ($10\ \mu m > D_p > 1.15\ \mu m$) particles – theoretical

I-96 traffic during the intensive was typical of the entire 5 week period (Fig. 2). For modeling purposes, traffic data for the intensive was broken into two periods: daytime (6 a.m. through 9 p.m.), and nighttime (9 p.m. through 6 a.m.). Daytime traffic averaged 10,479

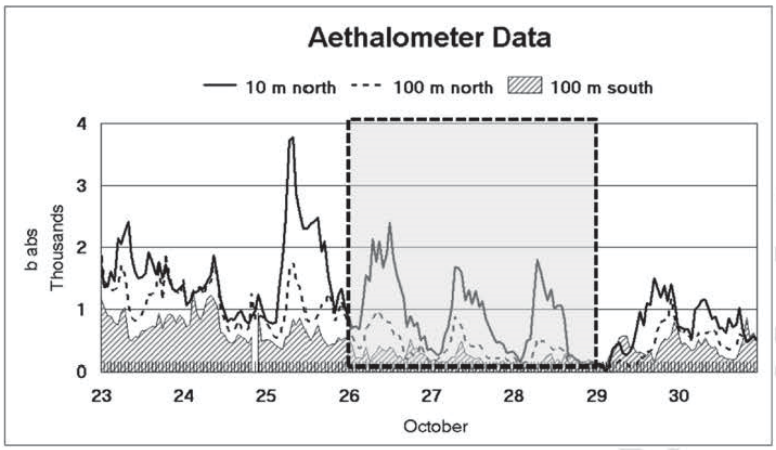


Fig. 13. Aethalometer data on optical absorption (~soot) from the EPA/FHWA National Near Road Study. The days chosen for the intensive are in the shaded area. October 25 and earlier days were rejected because of substantial upwind aerosol pollution seen in Figs. 5–7.

cars and light trucks/hr, and 824 heavy trucks/hr, while the numbers at night were 3874 and 187 vehicles/hr respectively.

For the theoretical analysis of the data, all coarse particles from 10 to 1.15 μm were used so as to allow comparisons to other work. We used a Sliding Box Model Estimate of the I-96 10 to 1.15 μm mass emission rate for the 3-day intensive. The "sliding box model" (Cahill and Feeney, 1973, Feeney et al., 1975; Courtney et al., 1978) is a well-tested way to measure roadway emissions when one has access to both upwind and downwind information on pollutants, a flat terrain, and a lateral wind across the roadway. The dimensions of the box are set by the roadway width, including lateral turbulence, and the top of the mixed zone, set by vehicle height and velocity. The latter is the greatest uncertainty, but extensive data on the height of the mixed zone were taken in Los Angles in 1973 and used in several studies. The length of the box is arbitrary, and we use 1.6 km, which was needed since the project accepted winds at ± 45° from normal and still had to meet the line source assumption even 300 m downwind. The box so defined represents a volume into which pollutants are uniformly mixed by vehicular turbulence. The box then slides laterally across the freeway while vehicles are emitting into the box. A new box takes its place upwind in a smooth transition and the process repeats.

The model was validated with data taken in 80 two-hr upwind-downwind periods of lead transport from five freeway sites in 1972 (Cahill and Feeney, 1973; Feeney et al., 1975). Since accurate traffic data and meteorology were available and emissions of automotive lead were precisely known from the literature (Habibi, 1973), the sliding box model gave a roadway edge prediction at the at-grade freeway section of 4.0 ± 0.4 μg/m^3 for 5000 vehicles/hr. The three day average measured at the at-grade site was in excellent agreement, 4.0 ± 0.15 μg/m^3. The sliding box model was also successfully applied in General Motors test facility studies of sulfur from catalytic converters (Courtney et al., 1978)

Sliding box model calculations were run separately for daytime, 6 a.m. to 9 p.m., and nighttime, 9 p.m. to 6 a.m., keyed to the traffic flow. Traffic flow, wind velocities were also separated in the analysis. It was assumed that trucks had 10 times the emission rates as cars (Gertler et al., 2003). Table 2 below shows the analysis for cars and trucks for calcium, and then the net result for calcium, iron, and zinc.

Coarse calcium and iron are enhanced by enrichment factors 5 and 10 times Earth crustal averages respectively (Fig. 14a and b), likely a consequence of the erosion of the concrete highway and iron-rich debris from vehicles. The transition and heavy metals, vanadium, copper, zinc, and lead, are enormously enhanced compared to Earth crustal averages and represent vehicular debris, including brake pads, brake drums and tire wear.

In this analysis, the unknown emission rates were calculated by matching the predicted concentrations to the measured concentrations at the 10 m north site after correcting for concentrations at the 100 m south site.

In Table 2, the emission rates in mg/km were fit to the NEXUS background corrected concentrations (μg/m^3) at 10 m north (Fig. 14a–c). Matching the upwind-corrected data at the 10 m north site for freeway impact to the predicted concentrations, emission rates of 1.5 mg/km for calcium, 2.8 mg/km for iron, and 0.09 mg/km for zinc are calculated, with truck emission rates 10 times these values.

Direct comparisons are possible to similar analyses in Los Angeles in 1972 from an at-grade concrete freeway. The NEXUS freeway-sourced calcium level in the mixed zone, 0.24 μg/m^3, is about 1/5 of that seen in 1973, 1.13 μg/m^3. Note that the Los Angeles freeway had not seen rain in over 2 months, while rain fell about once/week in the NEXUS study. For iron, which has both a concrete component and one associated with vehicle wear, the NEXUS values are 0.52 μg/m^3, versus 1.43 μg/m^3 in Los Angeles. For zinc, the NEXUS level of 0.017 μg/m^3 is far less than the 0.22 μg/m^3 seen in Los Angeles in 1973. The California data (Cahill et al., 2003) for 15 > D_p > 5.0 μm particles from tire wear were run through the sliding box model of Table 2 and yielded 120 ng/m^3 of zinc, about 10 times what was observed in NEXUS for < 5.0 μm particles (Fig. 14c). However, the upper cut point for the Los Angeles particles was ~15 μm, which increased the numbers, while better high mileage tires and aerosol size differences reduce the NEXUS value.

A very similar protocol (upwind-downwind samplers, rotating drum impactors, x-ray analysis) was utilized in Switzerland (Bukowiecki et al., 2010) for an extensive series of measurements to separate vehicular wear from exhaust emissions. The Swiss results showed most vehicular wear particles in the 10 to 1 μm range. The vehicular wear results were 50 ± 13 mg/km per vehicle for light duty

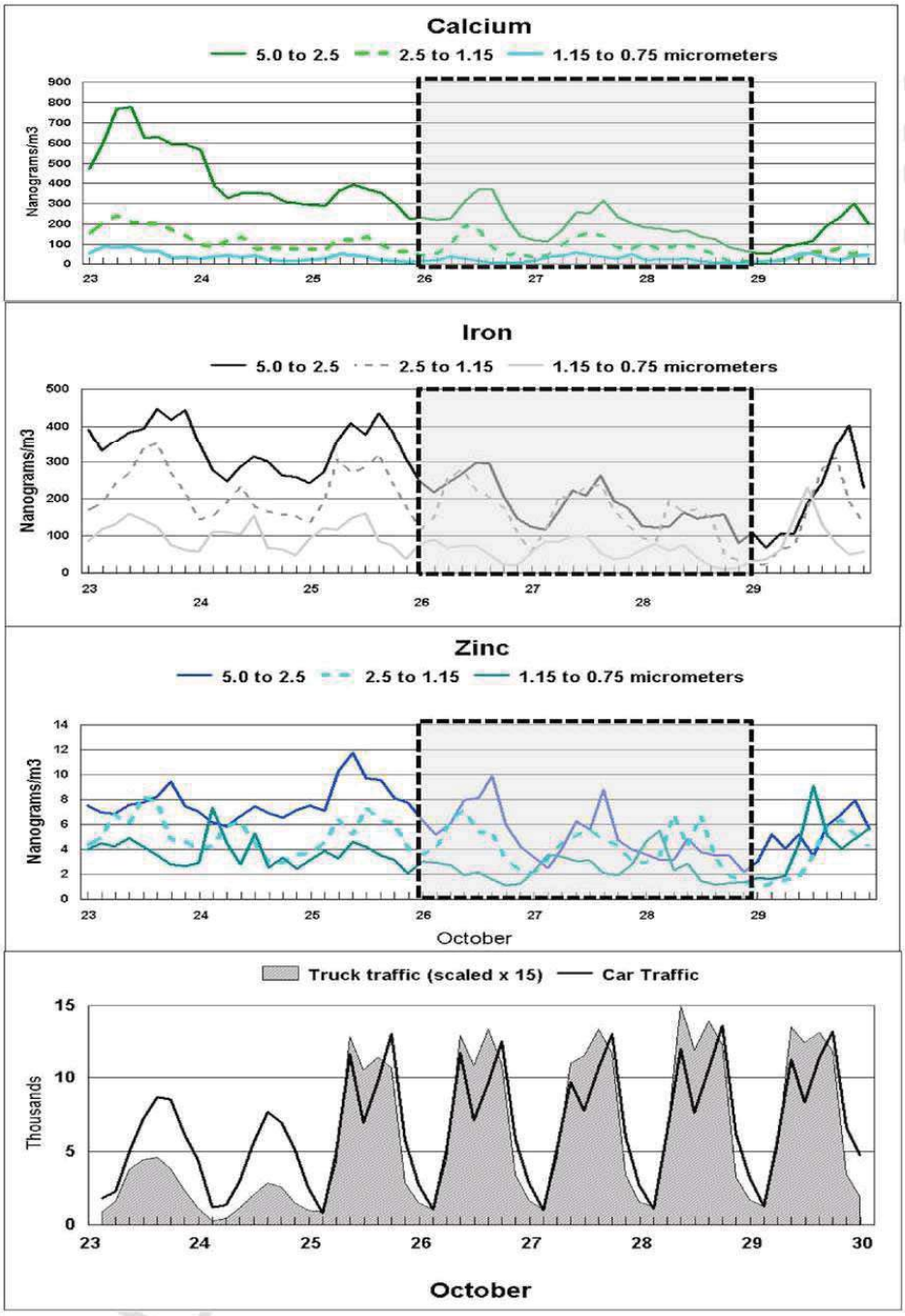


Fig. 14. a, b, and c. Typical roadway particles during the Oct. 26 through Oct 28 intensive (in shaded box). d. Traffic from Fig. 3 on the same time scales (trucks x 15).

vehicles, 288 ± 72 mg/km for heavy duty vehicles, with 3% brake wear, 56% suspended/abraded road dust, and no evident tire wear. This gives roughly 3.2 mg/km brake wear, assuming 6% trucks in their mix. If the NEXUS iron and zinc were all from brake wear, it would amount to roughly 5.2 mg/km, similar to the Swiss results. This is an overestimate, since the NEXUS iron value should be re-

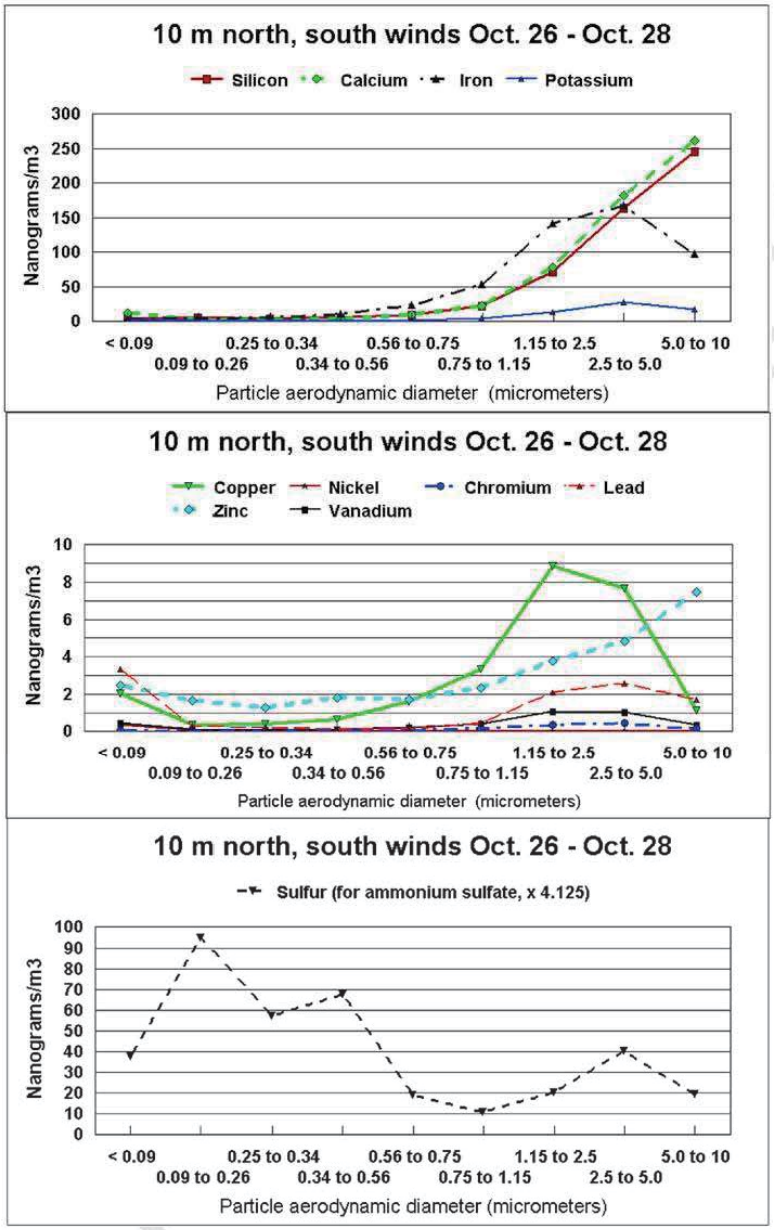


Fig. 15. Size distributions of a) crustal species; b) transition metals and lead; and c) sulfur at the 10 m north site during the NEXUS intensive.

duced due to iron from vehicle debris and roadbed wear.

5. Transects in the three day intensive: Fine $PM_{2.5}$ particles – experimental

Fig. 17a and b shows transects for fine crustal species and fine transition metals and lead, respectively, during the Oct. 26–28 intensive. Fine crustal species, like coarse, show a near-freeway enhancement, especially for iron, enhanced by a factor of 20 over typical soils. The fall-off versus distance is slower than with coarse species, with aluminum and silicon being essentially the same at the 10 m north and 100 m north sites The 300 m north site is almost identical to the 100 m south site, consistent with a regional background.

The data clearly show the impact of highway derived particles. First, the aluminum and silicon have about the correct ratio for Earth's crustal averages, and therefore represent crustal materials either in the roadway aggregate or the surrounding soils. The parking

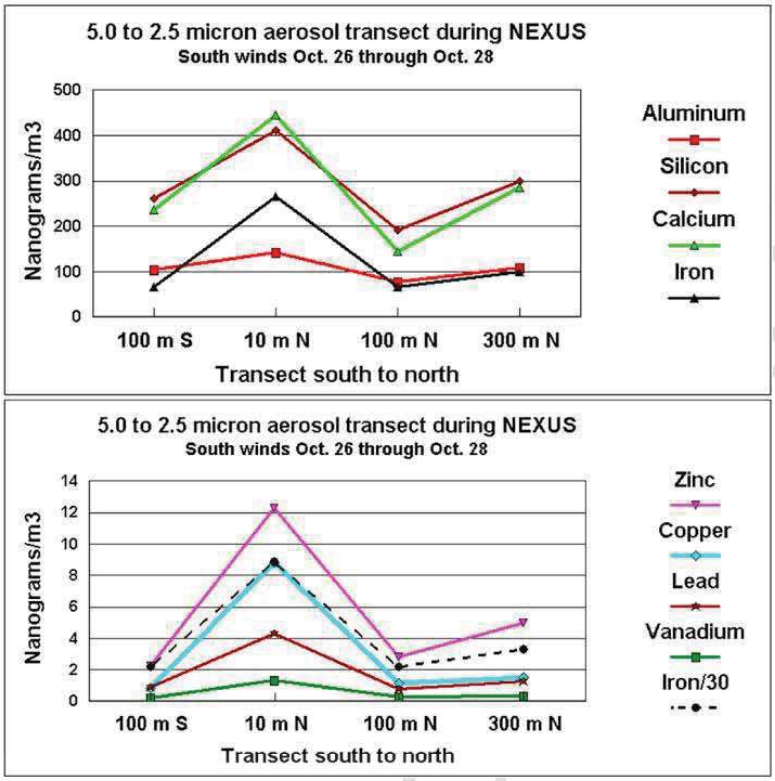


Fig. 16. Coarse aerosol transect during the Oct. 26–28 intensive: a) crustal species; b) transition metals and lead.

Table 1
Distance of samplers from roadway median and nearest active traffic lane of the 10 lane freeway. We also include the relative roadway impacts on cancer from the widely used model Emfac2007 (ARB, 2007).

Site	Distance from median	Distance from closest traffic lane	Relative cancer impact
100 m south	92 m south	71 m south	0.13 upwind
10 m north	26 m north	10 m north	1.00 downwind
100 m north	142 m north	100 m north	0.25 downwind
300 m north	332 m north	270 m north	0.10 downwind

area just upwind of the 100 m north site may also be a source of such materials. Calcium, however, is enhanced by a factor of about 3 over Earth's crustal average, and is consistent with roadway abrasion from the concrete highway. Iron is enhanced by a factor of about 10, which is consistent with brake wear and resuspended rust in a region where road salting is a common source of vehicle degradation. Fine copper (Fig. 17b) also shows enhancement, possibly from brake pads. In summary, fine concentrations of these resuspended soil and vehicular wear particles are about ½ of the observed mass, similar to European estimates that "wear" particles are about equal to tailpipe emissions (Denier Van der Gon et al., 2013).

All the non-crustal elements as well as zinc show a near freeway enhancement during the Oct. 26–28 intensive. All are strongly enhanced over what would be expected from soil, suggesting roadway pollution. The iron is about 16× the copper, while the iron/copper ratio from braking is only about 3. Thus, most of the iron is not from brake drums and pads, but probably represents re-suspended rust particles from degraded cars and trucks. Recall that little vehicular braking occurred in this freeway section. The 300 m north site is almost identical to the 100 m south site, establishing a small regional background. The fall-off versus distance for zinc is much slower, and the upwind value elevated, showing regional fine zinc aerosol sources. The enhanced zinc at 10 m north may be due to the zinc thiophosphate oil additive.

6. Transects in the three day intensive: Fine $PM_{2.5}$ particles – theoretical

In the sliding box model, we assumed an I-96 $PM_{2.5}$ mass emission rate (row labeled "Source $PM_{2.5}$ mass" in Table 3) based on recently measured car and truck emission rates for $PM_{2.5}$ in the eastern US (Gertler et al., 2003). The sliding box model was then used to calculate $PM_{2.5}$ values downwind of the freeway which were compared to measured $PM_{2.5}$ concentrations.

The results shown in Table 3 can be compared to the PM concentrations measured at the 10 m north site which was just on the edge of the lateral turbulence zone. The 24 h average $PM_{2.5}$ estimated for the 3 day intensive was 1.6 ± 0.5 μg/m^3, versus the measured 2.0 ± 0.7

Table 2
Sliding box model of coarse ($10 > D_p > 1.15$ μm) particles for daytime periods during the NEXUS 3 day intensive. LDV = Light duty vehicles, cars and light trucks (Class 1, 2); HDV = Heavy duty vehicles, trucks (Class 3–6).

Site		I-96 Detroit	I-96 Detroit	**I-96 Detroit**	**I-96 Detroit**	**I-96 Detroit**
Date	October 26–28, 2010	Calcium	Calcium	**Calcium**	**Iron**	**Zinc**
Time	15 h blocks	Days 6–21	Days 6–21	Days 6–21	Days 6–31	Days 6–21
Vehicle type	Classes	LDV	HDV	**Total cars and trucks**	**Total cars and trucks**	**Total cars and trucks**
Fit to data	**mg/km**	1.5	15.0	**1.5, 15**	**2.8, 28.3**	**0.09, 0.90**
Box dimensions	height m	5	5	**5**	**5**	**5**
	width m	54	54	**54**	**54**	**54**
	length m	1000	1000	**1000**	**1000**	**1000**
Box volume	x 1000 m^3	270	270	270	270	270
Traffic	vehicles/hr	10,479	824	**11,303**	**11,303**	**11,303**
Speed	mi/hr	69	69	**69**	**69**	**69**
Speed	km/hr	110.4	110.4	**110.4**	**110.4**	**110.4**
vehicles in box	# vehicles	95	7	**102**	**102**	**102**
Emissions	mg/min	142	112	**254**	**480**	**15.3**
Concentration in box per minute	μg/m^3	0.53	0.41	**0.94**	**1.78**	**0.057**
Wind velocity	m/second	3.1	3.1	**3.1**	**3.1**	**3.1**
Sliding box translation	Seconds	17.4	17.4	**17.4**	**17.42**	**17.4**
Sliding box translation	Fraction of minute	0.29	0.29	**0.29**	**0.29**	**0.29**
Calculated concentration at 10 m north	μg/m^3	0.153	0.120	**0.273**	**0.517**	**0.0164**
Measured concentrations 10 m north Los Angeles 1972	μg/m^3			**0.242 ± 0.050**	**0.516 ± 0.05**	**0.0169 ± 0.008**
5.0–15 μm	mg/mi			6.2, 62	8, 80	1.2, 12
Concentration in mixed zone	μg/m^3			**1.13**	**1.43**	**0.22**

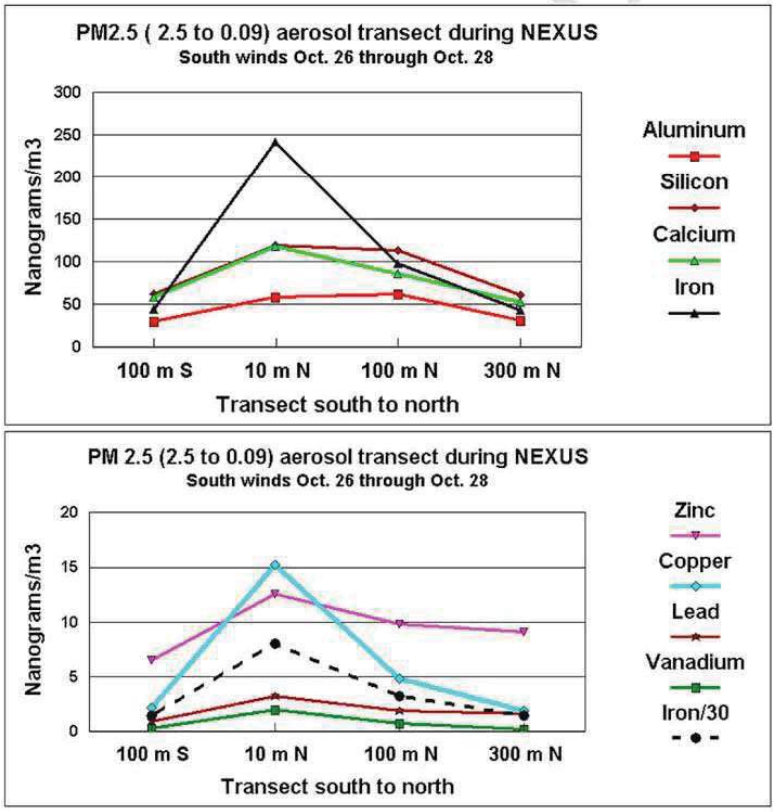


Fig. 17. Fine aerosol transect during the Oct. 26–28 intensive: a) crustal species; b) transition metals and lead.

Table 3
Sliding box model of the three day intensive, when meteorological and traffic conditions were suitable. Also shown are the Swiss data (2010) and Los Angeles data (1973) estimated from measured values.

Emission rate estimates		Gertler et al., 2003 eastern US	Gertler et al., 2003, eastern US	Gertler et al., 2003, eastern US	Bukowiecki et al., 2010, Swiss freeways	Cahill and Feeney, 1973, LA freeways
Time	15 h increment	Daytime 6 to 21	Daytime 6 to 21	24 h average	24 h average	24 h average
Vehicle type	Classes	LDV	HDV	All vehicles	All vehicles	All vehicles
Source $PM_{2.5}$ mass	mg/km	14	135	14/135	50/288	1056
Box dimensions	height m	5	5	5	5	5
	width m	54	54	54	54	54
	length m	1000	1000	1000	1000	1000
Box volume	x 1000 m^3	270	270	270	270	270
Traffic	vehicles/hr	10,479	824	7682	7682	7682
Speed	km/hr	110	110	110	110	110
vehicles in box	# vehicles	95	7	70	70	70
Emissions	mg/min	1329	1008	1528	4538	17,636
Concentration in box per minute	$\mu g/m^3$	4.9	3.7	5.7	16.9	65.3
Wind velocity	m/second	3.1	3.1	3.1	3.1	3.1
Sliding box translation	Seconds	17.4	17.4	17.4	17.4	17.4
Sliding box translation	Fraction of minute	0.29	0.29	0.29	0.29	0.29
Calculated $PM_{2.5}$ Concentration	$\mu g/m^3$	1.43, 1.08	0.53, 0.25	**1.6 ± 0.5**	**4.9 ± 1.2**	**19.0 ± 3**
Size ranges	$\mu g/m^3$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	PM_{10}	$PM_{5.0}$
Measured $PM_{2.5}$ Concentrations (some estimated)	$\mu g/m^3$			**2.0 ± 0.7**	**3.1 ± 1(est)**	**16 ± 2 (est)**

$\mu g/m^3$. Note that the Gertler et al., 2003 emission values were for California cars and fuels.

Table 3 also includes estimates of the 10 m north concentrations based on the Swiss (Bukowiecki et al., 2010) and Los Angeles (Habibi, 1973; Cahill and Feeney, 1973) freeway emission rates. The Swiss study gave PM_{10} emission rates of 50 ± 13 mg/km for light duty vehicles, and 288 ± 72 mg/km for heavy duty vehicles. Applying these emission rates to the NEXUS configuration, one would predict about 4.9 $\mu g/m^3$ PM_{10} mass at the freeway edge, slightly less than the 10 $\mu g/m^3$ to 19 $\mu g/m^3$ $PM_{2.5}$ values reported as the traffic-impacted Central European average (Denier Van der Gon et al., 2013). The Swiss data included about ½ roadway crustal particles, which would likely reduce their 4.9 $\mu g/m^3$ PM_{10} values to around 3.1 $\mu g/m^3$ of $PM_{2.5}$.

The right hand column of Table 3 is the predicted 24 h $PM_{5.0}$ mass at the 10 m north site using the emission rates from the 1973 Los Angeles study (Habibi, 1973). The mean estimated $PM_{2.5}$ mass concentration of 19 $\mu g/m^3$, would also have included 2.7 $\mu g/m^3$ of lead. Making the correction for presumed coarse roadway wear particles, the 1973 $PM_{5.0}$ data would be reduced to roughly 16 $\mu g/m^3$ equivalent $PM_{2.5}$ in the NEXUS configuration.

7. Transects in the three day intensive: Very fine (0.26 μm > Dp > 0.09 μm) particles

Very fine particles (Fig. 18) were less impacted by distance from the freeway compared to fine and coarse particles. These results reinforce the behavior seen in the Los Angeles I-710 studies (Fig. 19, Zhu et al., 2002) in which very fine and ultra-fine components extended both upwind and downwind from the array with little change in concentration with distance from the freeway once one was farther away than about 150 m (see Fig.19).

1.7. Ultra-fine particles

The development of a means to measure ultra-fine particles as a function of time allows for the first time the ability to match compositionally-resolved ultra-fine particles to potential sources and meteorology. Two such units were built and tested to run behind the DELTA 8 DRUM, which has a validated lower cut point of 0.09 μm. Thus, for this study, ultra-fine particles are particles having aerodynamic diameters <0.09 μm. These two units were placed at the 10 m north site and the main site at 100 m north, and ran for 5 weeks to match the 8 DRUMs.

The ultra-fine data did not have an upwind site, but the agreement between the 10 m north and 100 m north sites is confirmation of a regional distribution. The major exception to this pattern was optical attenuation (Fig. 13), which in the 0.26 > D_p > 0.09 μm size mode is almost entirely soot, largely from diesel trucks. We did not measure soot in the DRUM ultra-fine mode.

An examination of the 3 day intensive period at 10 m north showed that, of the four elements known to be present in the ultra-fine size ranges from traffic, zinc and iron show some modest correlation with daytime traffic peaks (Fig. 21). Recall, however, that relatively little braking occurs on this stretch of I-96.

Ultra-fine particles at the 100 m north site showed essentially no correlation with daytime traffic, in accord with the factor of ~10 reduction seen in previous studies (Cahill and Feeney, 1973; Zhu et al., 2002; Emfac2007). For diesel-generated ultra-fine sulfur, (Zielinska et al., 2004), the freeway contribution is largely lost in high levels of ultra-fine sulfur associated with upwind sources possibly including the Monroe coal-fired power plant.

2. Discussion

The particles in the NEXUS study ranged from coarse concrete erosion and resuspended roadway particles contaminated with tire and brake drum debris, to very fine and ultra-fine particles generated by traffic and diverse regional sources.

The behavior of the particles during the three day transect intensive was roughly as expected, with coarser particle concentrations declining rapidly downwind while fine and especially very fine particle concentrations dropped more slowly, as shown in Figs. 16–18.

The agreement between the predictions of the sliding box model and the observed near-roadway $PM_{2.5}$ concentrations (Table 3) gives confidence that literature emission rates used in the model must be close to reality. The results also highlight the enormous improvement in vehicle tailpipe emissions in the past 40 years.

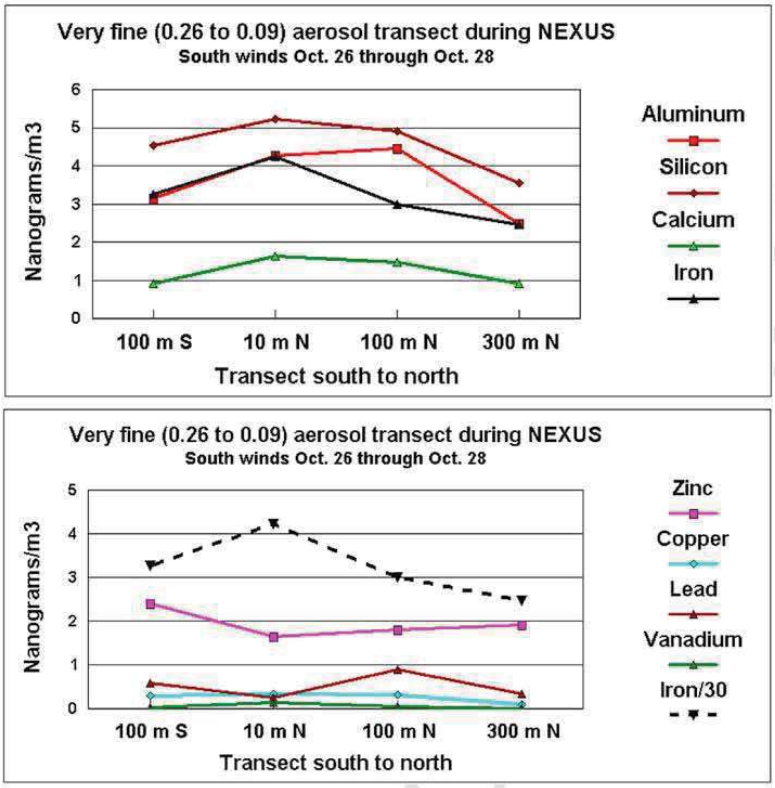


Fig. 18. Very fine aerosol transect during the Oct. 26–28 intensive. a) crustal species; b) transition metals and lead.

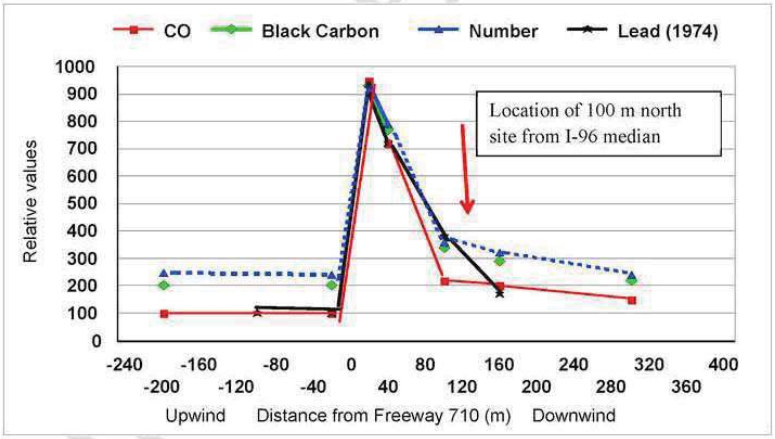


Fig. 19. Transect of Interstate 710 in Los Angeles from Zhu et al. (2002). Superimposed are lead data from 1973 (Cahill and Feeney, 1973; Feeney et al., 1975). The arrow marks the distance of the 100 m north site from the I-96 median in the present study.

The situation with the ultra-fine particles, on the other hand, indicates a dominance of regional concentrations little affected by the nearby freeway traffic with the striking exception of optical absorption (diesel soot) as seen in both optical spectroscopy from the DRUM finest stages and the aethalometer data (Fig. 13). The ultra-fine particles have elemental signatures consistent with brake wear and zinc in motor oil, but the concentrations are small, consistent with little braking on that section of I-96 during the 3 day intensive.

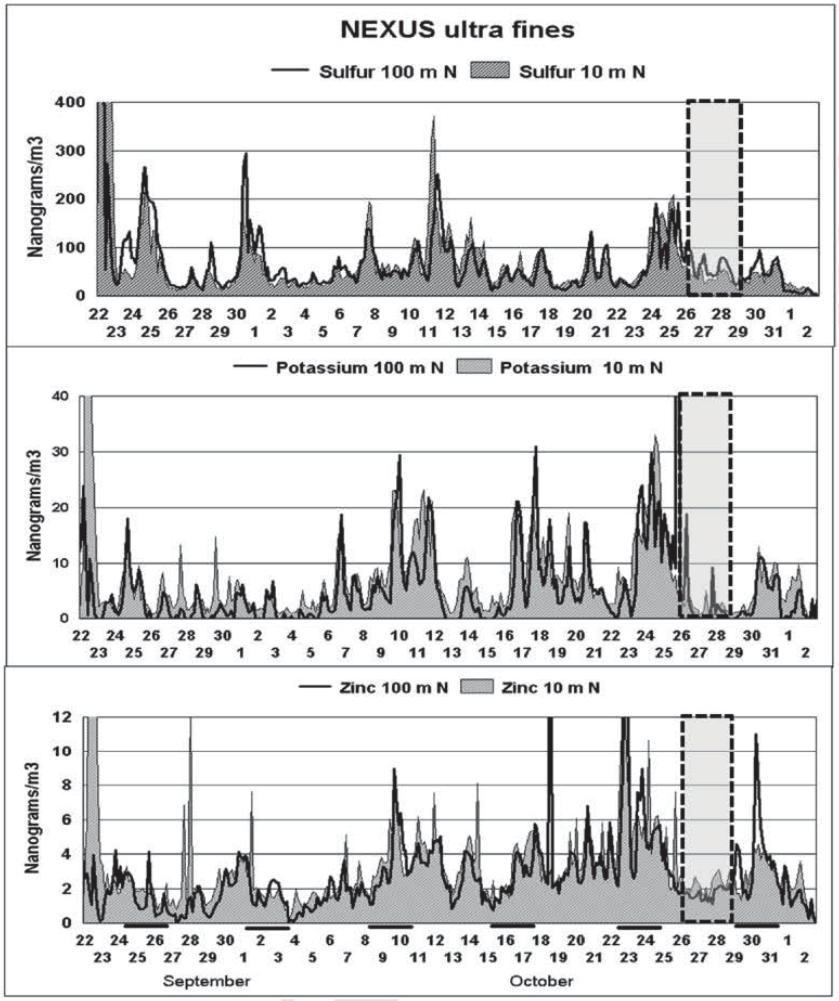


Fig. 20. Ultra-fine sulfur, potassium, and zinc at the 10 m N and 100 m N sites. The large ultra-fine sulfur peaks on October 24 through 25 were likely from the Monroe coal fired power plant. The Sept. 30 and Oct. 12 plumes were from a source to the north. Black lines above the dates in the zinc plot are weekends.

These three days were selected when there was minimal impact from Telegraph Avenue which had extensive stop and go periods. The ultra-fine data are a more extreme case of the behavior seen in the very fine particles, which had large regional sources and fell off slowly downwind.

The potential exposure and human health implications of these particles can be estimated by comparison with recent work tying roadway-derived ultra-fine particles to ischemic heart disease in the California Central Valley (Cahill et al., 2011). An increase in IHD mortality of ~30% at Bakersfield, CA, was associated with elevated levels of very fine and ultra-fine roadway-derived transition metal particles, mostly from brake drums and pads (Table 4 below). However, the concentrations in Detroit were generally far lower than those measured in Bakersfield.

As shown in Table 4, ultra-fine concentrations measured at the 10 m north and 100 m north sites are similar to those at Watt Avenue (Spring) in Sacramento, CA measured 20 m downwind of a 65,000 vehicles/day secondary street, at a stop light, during non-inversion conditions (Cahill et al., 2014). In both cases, little influence was seen from the nearby roadway, and the ultra-fine particles were regionally distributed. However, there was only very limited braking and acceleration during the NEXUS intensive, thus limiting concentrations of brake wear particles. Nevertheless, if the observed ultra-fine metallic particles see in the NEXUS experiment extend over large numbers of people, it could potentially enhance the ischemic heart disease death rate in the same manner seen in Bakersfield, CA (Cahill et al., 2011).

3. Conclusions

Important differences in the behavior of particles of different sizes were observed during this study. For coarse species, the fall-off in concentration versus distance was rapid, roughly in accord with cur-

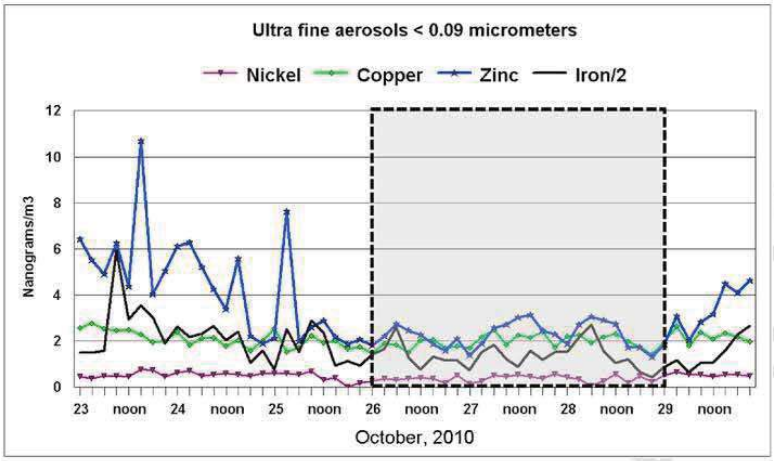


Fig. 21. Ultra-fine nickel, copper, iron and zinc at 10 m north during the 3 day intensive.

Table 4
Comparison of ultra-fine (D_p < 0.09 μm) traffic-derived particles measured in NEXUS versus Watt Ave. in suburban Sacramento, CA during spring non-inversion conditions (Cahill et al., 2014). NEXUS concentrations are 5-week averages. na = not available. For comparison, winter values which are impacted by strong surfaced-based inversions in the California Central Valley are included. The sources of the high nickel values seen at Watt Avenue in winter were totally absent 500 m upwind, so they must be associated with Watt Avenue traffic. Such levels, however, have never been seen in our other studies.

Ultra-fine elements (ng/m^3)	S	P	Fe (non-soil)	Ni	Cu	Zn	Pb
Non-inversion conditions							
Detroit							
10 m n	68.1	10.5	3.4	0.5	1.9	3.2	2.9
100 m n	61.4	9.5	3.4	0.5	1.8	2.6	3.3
Watt Ave (Spring)	129	na	4.8	0.3	0.4	2.0	1.4
Strong inversions conditions							
Watt Ave (Winter)	42.8	na	29.3	12.1	9.3	13.7	1.6
Sacramento (Winter)	52	4.0	14.3	0.6	na	14.3	2.5
Bakersfield (Winter)	242	10.5	27.7	1.6	na	12.3	2.6

rent models such as Emfac2007. Concentrations were strongly affected by meteorology such as wind velocity and rain fall. For the $PM_{2.5}$ particles, the fall off versus distance was still close to the models, reaching a 90% reduction in freeway-derived particles in the 200–250 m range. Very fine particles, 0.26 > D_p > 0.09 μm diameter, persisted all the way to the 300 m downwind site, with only a modest reduction in concentrations. Ultra-fine particles were only measured at two sites, 10 m north and 100 m north, and the concentrations at both sites were almost identical indicating a very slow fall off and/or strong upwind sources. The persistence of ultra-fine particles in urban areas away from freeways was also observed in the Los Angeles data (Zhu et al., 2002).

A 3-day period of southerly winds provided an opportunity to conduct an upwind-downwind highway transect to assess the impact of roadway emissions. For $PM_{2.5}$, the transect yielded a measured near-roadway $PM_{2.5}$ concentration of 2.0 ± 0.7 μg/m^3 versus a value of 1.6 ± 0.5 μg/m^3 predicted from recent California vehicle emission rates and ~3 μg/m^3 using current European freeway data. Thus, measured $PM_{2.5}$ concentrations at the near-road site showed excellent agreement with predicted $PM_{2.5}$ concentrations assuming recent published emission rates. By contrast, using 1973 emission rates one would predict roughly 16 μg/m^3 of $PM_{2.5}$, thus illustrating the dramatic progress that has been made in reducing roadway emissions in the US during the past four decades.

The NEXUS and European estimates of the contribution of brake drums were also similar, although numerous assumptions are needed to make the comparison. The European value is roughly 3.2 mg/km brake wear, assuming 6% trucks in their mix. The NEXUS iron values were strongly enhanced over soil concentrations, indicating roadway sources including brake wear. The fine and very fine zinc particles were too fine in size to be from tire erosion. With these assumptions, the expected emission rate from brake wear is roughly 5.2 mg/km, similar to the European values especially after some iron reduction from vehicle debris and roadbed wear.

For ultra-fine particles, there was a dramatic increase in diesel soot, closely tied to traffic volumes, but only a modest increase in traffic-correlated zinc and other transition metals during the 3 day intensive. For the rest of the 5 week study, mean elemental concentrations were essentially identical at the 10 m and 100 m north sites and highly correlated in time. Further, this correlation existed independent of wind direction, including having both the 10 m north and 100 m north sites upwind of the freeway. From these results, we conclude that most of the time the freeway was a negligible enhancement of a regional ultra-fine background of transition metals.

The regional ultra-fine species closely resembled those seen in a recent study of stop-and-go traffic on a heavily traveled secondary road with heavy braking (Cahill et al., 2014). These particles are similar in composition to debris from brake pads, drums, and the zinc additive in motor oil (Cahill et al., 2011). These results reinforce the behavior seen in the Los Angeles I-710 studies (Zhu et al., 2002) for ultra-fine particle number and black carbon, e.g., these components extended well upwind of the freeway and were soon reestablished at the same concentrations downwind beyond 150 m, thus showing a regional distribution of ultra-fines well away from the local freeway.

The NEXUS data also support the conclusions of Zhu et al. (2002) that little coagulation or particle size growth was seen in ultra-fines from freeways, as both Zhu's ultra-fine soot and particle number data were essentially identical versus distance with non-reactive CO.

The conclusion from this study is that for traffic on a freely flowing, high speed freeway with little braking and acceleration, almost all ultra-fine particles except for diesel soot, and most of the very fine particles, are generated from diverse vehicular and industrial sources

in the region and are not directly associated with local freeway traffic.

Uncited reference

Acknowledgements

The authors gratefully acknowledge the assistance in meteorological models of Ron Henry, as well as the detailed aethalometer, meteorological and traffic data of the US EPA/FHWA study (US EPA, 2013). The United States Environmental Protection Agency through its Office of Research and Development funded and collaborated in the research described here under contract EP-12-D-000219 to the University of California, Davis. It has been subjected to Agency review and approved for publication.

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.atmosenv.2016.09.023.

References

ARB, 2007. Emfac2007. California Air Resources Board. http://www.arb.ca.gov/msei/onroad/downloads/docs/user_guide_emfac2007.pdf.

Bukowiecki, N., Lienemann, P., Hill, M., Furger, M., Richard, A., Amato, F., Prévôt, A.S.H., Baltensperger, U., Buchmann, B., Gehrig, R., 2010. PM10 emission factors for non-exhaust particles generated by road traffic in an urban street canyon and along a freeway in Switzerland. Atmos. Environ. 44, 2330–2340.

Cahill, T.A., Feeney, P.J., 1973. Contribution of Freeway Traffic to Airborne Particulate Matter. Final Report of the California Air Resources Board, Contract ARB-502.

Cahill, T.A., Goodart, C., Nelson, J.W., Eldred, R.A., Nasstrom, J.S., Feeney, P.J., 1985. In: In: Ariman, Teoman, Nejat Veziroglu, T. (Eds.), Design and Evaluation of the Drum Impactor. Proceedings of International Symposium on Particulate and Multi-phase Processes. vol. 2. Hemisphere Publishing Corporation, Washington, D.C, pp. 319–325.

Cahill, T.A., Barnes, D.E., 2009. Comparison of Fine Mass, UC Davis DRUM versus FRM, at the ARB 13th and T Street Site. Final Report to the California ARB (2009).

Cahill, Thomas A., Barnes, David E., Spada, Nicholas J., Lawton, Jonathan A., Cahill, Thomas M., 2011. Very fine and ultra-fine metals and ischemic heart disease in the California Central Valley 1: 2003 – 2007. Aerosol Sci. Technol. 45, 1125–1134.

Cahill, T.A., Barnes, D.E., Lawton, J.A., Miller, R., Spada, N.J., Cliff, S.S., Zhou, Y.J., Perry, K.D., Cahill, C.F., 2010. Continuous Aerosol Sampling and Analysis in Support of Health Based Studies. Final Report to W. Wilson, US EPA RFQ-RT-09–00122.

Cahill, T.A., 2010. How does Vegetation affect pollution removal. In: The Workshop on the Role of Vegetation in Mitigation Air Quality Impacts from Traffic Emissions EPA RTP North Carolina April 27, 28.

Cahill, Thomas M., Cahill, Thomas A., 2013. Seasonal variability of particle-associated organic compounds near a heavily traveled secondary road. Aerosol Sci. Technol. http://dx.doi.org/10.1080/02786826.2013.857757.

Cahill, T.A., Barnes, D.E., Spada, N.J., 2014. Seasonal variability of ultra-fine metals downwind of a heavily traveled secondary road. Atmos. Environ. 94, 173–179.

Chen, L.C., Lippmann, M., 2009. Effects of metals within ambient air particulate matter (PM) on human health. Inhal. Toxicol. Int. Forum Resp. Res. 21, 1–31.

Courtney, W.J., Rheingrover, S., Pilotte, J., Kaufmann, H.C., Cahill, T.A., Nelson, J.W., 1978. Continuous observation of particulates during the general motors sulfate dispersion experiment. J. Air Pollut. Control Assoc. 28, 225–228.

Denier Van der Gon, H., Gerlofs Nijland, M., Gehrig, R., Gustafsson, M., Janssen, N., Harrison, R., Hulskotte, J., Johansson, C., Jozwicka, M., Keuken, M., Krijgsheld, K., Ntziachristos, L., Riediker, M., Cassee, F., 2013. The policy relevance of wear emissions from road transport, now and in the Future – an international workshop report and consensus statement. J. Air Waste Manag. Assoc. 63, 136–149.

Feeney, P.J., Cahill, T.A., Flocchini, R.G., Eldred, R.A., Shadoan, D.J., Dunn, T., 1975. Effect of roadbed configuration on traffic derived aerosols. J. Air Pollut. Control Assoc. 25, 1145–1147.

Gauderman, W.J., McConnell, R., Gilliland, F., London, S., Thomas, D., Avol, E., Vora, H., Berhane, K., Rappaport, E.B., Lurmann, F., Margolis, H.G., Peters, J., 2000. Association between air pollution and lung function growth in southern California children. Am. J. Respir. Crit. Care Med. 162, 1383–1390.

Gertler, Alan, Abu-Allaban, Mahmoud, Coulombe, William, Gillies, John A., Pierson, William R., Rogers Rogers Fred, C., Sagebiel, John C., Tarnay, Leland, Cahill, Thomas A., 2003. Measurements of mobile source particulate emissions in a highway tunnel. Int. J. Veh. Des. 27, 86–93.

Habibi, Kamran, 1973. Characterization of particulate matter in vehicle exhaust. Environ. Sci. Technol. 7 (3), 223–234. http://dx.doi.org/10.1021/es60075a001.

Health Effects Institute, 2009. Traffic Related Air Pollution: a Critical Review of the Literature on Emissions, Exposure, and Health Effects. HEI 17, Boston, MA.

Henry, Ronald C., Vette, Alan, Norris, Gary, Vedantham, Ram, Kimbrough, Sue, Shores, Richard C., 2011. Separating the air quality impact of a major highway and nearby sources by nonparametric trajectory analysis. Environ. Sci. Technol. 45, 10471–10476. http://dx.doi.org/10.1021/es202070k.

Karner, A.A., Eisinger, D.S., Neimeier, D.A., 2010. Near roadway air quality: synthesizing the findings from real world data. Environ. Sci. Technol. 44, 5334–5344.

Lewis, T.C., Robins, T.G., Dvonch, J.T., Keeler, G.J., Yip, F.Y., Mentz, G.B., Lin, X.H., Parker, E.A., Israel, B.A., Gonzalez, L., Hill, Y., 2005. Air pollution-associated changes in lung function among asthmatic children in Detroit. Environ. Health Perspect. 113, 1068–1075.

Lin, C.C., Peng, C.K., 2010. Characterization of indoor PM10, PM2.5, and ultra-fine particles in elementary school classrooms: a review. Environ. Eng. Sci. 27, 915–922.

Lippmann, Morton, 2009. Semi-continuous speciation analyses for ambient air particulate matter: an urgent need for health effects studies. J. Expo. Sci. Epidemiol. Stud. 19, 235–247.

Malm, W.C., Sisler, J.F., Huffman, D., Eldred, R.A., Cahill, T.A., 1994. Spatial and seasonal trends in particle concentration and optical extinction in the United States. J. Geophys. Res. 99 (1), 1347–1370.

McGee, M.A., Kamal, A.S., McGee, J.K., Wood, C.E., Dye, J.A., Krantz, Q.T., Landis, M.S., Gilmour, M.I., Gavett, S.H., 2015. Differential effects of particulate matter upwind and downwind of an urban freeway in an allergic mouse model. Environ. Sci. Technol. 49 (6), 3930–3939.

Nichols, M., 2009. Letter and Appended Report from the Staff of the California Air Resources Board.

Oberdorster, Gunter, Stone, Vicki, Donaldson, Ken, 2007. Toxicology of nanoparticles: a historical perspective. Nanotoxicology 1 (1), 2_25.

Peters, John M., Avol, Edward, Navidi, William, London, Stephanie J., James Gauderman, W., Lurman, Fred, Linn, William S., Margolis, Helene, Rappaport, Edward, Gong Jr., Henry, Thomas, Duncan C., 1999a. A study of Twelve southern California communities with differing levels and types of air pollution I. Prevalence of respiratory morbidity. Am. J. Respir. Crit. Care Med. 159 (3), 760–767.

Peters, John M., Avol, Edward, Navidi, William, London, Stephanie J., James Gauderman, W., Lurman, Fred, Linn, William S., Margolis, Helene, Rappaport, Edward, Gong Jr., Henry, Thomas, Duncan C., 1999b. A study of Twelve southern California communities with differing levels and types of air pollution; II. Effects on pulmonary function. Am. J. Respir. Crit. Care Med. 159 (3), 768–775.

Raabe, Otto G., Braaten, David A., Axelbaum, Richard L., Teague, Stephen V., Cahill, Thomas A., 1988. Calibration studies of the DRUM impactor. J. Aerosol Sci. 19 (2), 183–195. Personal communication 1995.

US EPA, 2013. FHWA and EPA National Near-road Study. Detroit, MI. Report No. DTFH61-07-X-30015 http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/near_road_study/detroit_michigan/index.cfm.

Vette, A., Burke, J., Norris, G., Landis, M., Batterman, S., Breen, M., Isakov, V., Lewis, T., Gilmour, M.I., Kamal, A., Hammond, D., Vedantham, R., Bereznicki, S., Tian, N., Croghan, C., 2013. The near-road exposures and effects of urban air pollutants study (NEXUS): study design and methods. Sci. Total Environ. 448, 38–47.

Zielinska, B., Goliff, W., McDaniel, M., Cahill, T., Kittelson, D., Watts, W., 2003. Chemical Analyses of Collected Diesel Particulate Matter Samples in the E-43 Project. National Renewable Energy Laboratory.

Zielinska, B., Sagebiel, J., McDonald, J.D., Whitney, K., Lawson, D.R., 2004. Emission rates and comparative Chemical composition from selected in-use diesel and gasoline fueled vehicles. J. Air Waste Manag. Assoc. 54, 1138–1150.

Zhu, Y., Hinds, W.C., Kim, S., Shen, S., Sioutas, C., 2002. Study of ultra-fine particles near a major highway with heavy duty diesel traffic. Atmos. Environ. 36, 4323–4335.

Community Environmental Advocates
PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

requirements of Mitigation Measure 11a. Thus, Alternative A's contribution to GHGs is considered cumulatively considerable and is a significant and unavoidable impact.

Alternative B
Mitigation Measure 11a would minimize GHG emissions associated with project operations, however, approximately 90% of Alternative B's annual GHG emissions are from mobile sources which would not be reduced by Mitigation Measure 11a. Thus, Alternative B's contribution to GHGs is considered cumulatively considerable and is a significant and unavoidable impact."

L-6 Cont.

Impact Analysis Comments

11-4 Mitigation Measures contain no measures that would help reduce the GHG emissions from transportation mobile sources. Since before this project there are no significant impacts from the site, these impacts must be considered an impediment toward approving this project and the DEIR.

We suggest there are additional measures that can be taken to reduce the mobile source impacts.

Transportation

1) Encourage the use of electric cars by the residents by installing Level II charging stations throughout the project area. This energy needs to be produced by photovoltaic solar. This can be from solar panels atop covered parking or from a community solar installation located on site. Cost of installation would be paid by the developer, and charging would be free to the resident. There are electric cars that can travel form Dorsey to Sacramento and back on a single charge, which would significantly reduce the mobile GHG source..

L-7

PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

2) Provide electric bus shuttles that go throughout the day and early evening to the Sutton theatre, Tri-county bank, Bank of America, Staples and Grocery Outlet. The Buses could use a level3 charging station onsite. Driver's salary would be covered by the City and the developer. L-8

Energy use in buildings

Tables 11.4 and 11.5 show Energy (natural gas and electricity) of around 700 metric tons of CO2 being produced by the project per year. The DEIR does include one measure that states *All-Residential be pre-plumbed and structurally engineered for the installation of a complete solar energy system*.

However, this is voluntary and there is no guarantee that these units will be installed. An individual apartment owner will have no way to install solar on a common rooftop. Since the electric meters will be installed for each apartment the landlord would have no incentive to provide solar unless it is done upfront to reduce rental prices. L-9

We suggest that all-electric buildings be required for this project.

1) A community solar project should be built on part of the land that would provide all of the solar power for the whole development. Each individual meter would be connected to allocate the electricity cost back to the individual owner. The project should include backup battery storage that would protect the residents from a rolling blackout or when PG&E turns off power due to a threatening fire danger. An alternative would be rooftop solar, but a separate land installation would allow the rooftops to not have to face southwest and would allow light colored roofs that could reflect back solar radiation reducing air conditioning costs.

2) Natural gas is a fossil fuel that is going to be phased out over the next few decades to reach 100% renewable energy. It is much cheaper to build all-electric buildings now rather than a quite expensive retrofit in the future. Burning gas is now a bigger source of GHG pollution than burning coal, and nearly a third of that gas is L-10

Community Environmental Advocates

PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

burned in homes and commercial buildings. A heat pump can replace both the furnace and the air conditioner. In the winter, it sucks heat in from the outside, even when the weather is cold, and blows it into your house. In the summer, a heat pump runs in reverse, cooling the house. Highly efficient heat-pump water heaters are also widely available. Building a new all-electric home powered by heat pumps is already cheaper than building with gas because you avoid the costs of gas lines and ventilation. Induction cooktops, running on electricity, are superior to gas stoves. The perceived advantage of gas stoves is pinpoint control of heat, but induction cooktops using magnetic waves are more precise, and faster. For now, induction cooktops are generally more expensive than gas stoves. At retail, 30-inch gas cooktops generally run $500 to $1,000, while induction cooktops of that size run from $800 to $2,000. A change to induction cooking would make sense even if the climate were not a concern, because gas stoves are polluting our homes. Over the past decade, a growing body of scientific evidence has shown that gas stoves throw off pollutants like nitrogen dioxide and carbon monoxide. When you are cooking, those invisible pollutants can easily reach levels that would be illegal outdoors, but the Clean Air Act does not reach inside the home.

L-10 Cont.

"Impact 11-2 Would the project conflict with the City's Climate Action Plan? Both Alternatives Less than Significant None Required Less than Significant. There are currently no adopted local or regional GHG reduction plans applicable to the proposed project. The City of Grass Valley is in the process of developing an energy action plan that will provide various strategies and goals to accelerate energy efficiency, renewable energy, and water efficiency projects by residents, businesses and public agencies."

As pointed out earlier, the goal of the Grass Valley plan (page 2) is "to reduce the projected annual utility-supplied electricity use in 2035 by 36%. This paragraph from the DEIR should be modified to reflect the Plan.

L-11

PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

CEQA Mandated sections

Impact 16-2: Would the project cause a permanent increase in wasteful, inefficient, and unnecessary energy consumption or fail to comply with state and federal energy standards?

Conclusion Overall, the proposed project would result in an increase in energy consumption, with the project requiring a total of 9,247,445,720 kWh associated with vehicle trips to/from and within the project site, 3,010,485 kWh in on-site electricity consumption, and 2,279,852 kBtu in on-site natural gas consumption. As noted in Section 16.5.1, Energy Setting, the project's energy demands would be consistent with the anticipated level of economic development and growth in the region. The demand for local housing and commercial spaces in the project area demonstrate that the energy consumption of these facilities would not be unnecessary. Therefore, impacts related to wasteful, inefficient, or unnecessary energy consumption would be less than significant.

However, as pointed out earlier, the DEIR states: *Thus, Alternative B's contribution to GHGs is considered cumulatively considerable and is a significant and unavoidable impact.* **Thus, in this period of recognized impacts with climate change, even though growth may be incurring that is not considered wasteful and unnecessary, it still matters how projects are done as well as whether projects are done. Our earlier comments how there are better ways to do a project that mitigate and lessen the significant impacts.**

L-12

Page 16-12 states*: However, consistent with the California Green Building Code, solar panels would be provided in association with the proposed residential land use.* This statement is stronger than an earlier statement that said: *All-Residential be pre-plumbed and structurally engineered for the installation of a complete solar energy system.*

We strongly support that solar panels be provided as part of the project, and should be part of the ultimate project approval.

L-13

Community Environmental Advocates

PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

16-3 Could the proposed project objectives be achieved through a feasible alternative that would substantially reduce the amount of energy required over the life of the project or through a feasible alternative that would include use of alternative fuels or energy systems? Both Alternatives Less than Significant None Required Less than Significant. None of these alternatives would result in a more efficient use of energy. As the local demand for housing, employment, and retail/commercial services increases, energy will be consumed in providing those services. A reduction in the amount of housing or commercial and office space developed on site would not necessarily reduce energy consumption, as local residents would continue to drive out of the City to seek commercial/retail services and commute to places of employment. Therefore, both Alternative A and Alternative B will have less than significant impacts.

This assumes that local residents would be the people who would be moving to this site. In actuality, it is highly likely that additional people outside the area would be moving into this site and thus increase energy uses. **So an alternative that reduced the size of the development would be less growth inducing, and could encourage development in areas like Auburn and Sacramento to provide housing that would not require long commutes. In addition, just because lower size projects might not necessarily reduce energy consumption does not follow that Alternatives A and B have less than significant impacts.**

L-14

Thank you for your consideration.

Barbara and Donald Rivenes on behalf of CEA

INTENTIONALLY LEFT BLANK

Response to Comment Letter L

Community Environmental Advocates
Barbara and Donald Rivenes
May 6, 2019

L-1 The comment identifies concerns regarding impacts associated with climate change, cumulative effects on traffic, schools, library use and parks, and whether the identified mitigation measures are sufficient to reduce cumulative impacts to less than significant levels. Regarding cumulative impacts, the comment notes this analysis should consider all of the new projects in the City of Grass Valley, particularly Makiah Woods, Gold Country Village, and Loma Rica Ranch. The comment notes that Loma Rica Ranch is one mile from the proposed project and is expected to be constructed at the same time as the project, and thus would impact the same intersections.

Table 3-2 in Chapter 3: Land Use and Planning lists the proposed and approved projects within the City of Grass Valley at the time that the EIR was prepared. This list includes the Makiah Woods, Gold Country Village, and Loma Rica Ranch projects. The comment does not identify specific concerns regarding cumulative impacts and does not identify any deficiencies in the Draft EIR analysis of cumulative impacts.

Cumulative impacts to traffic are evaluated in Impact 8-9 of Chapter 8, Transportation. The analysis considers the traffic volumes and associated levels of service for all of the study area intersections and Caltrans facilities. The analysis found that the project would contribute to significant impacts anticipated in the cumulative scenario. Mitigation measures are identified to reduce those impacts to the extent feasible. With mitigation, the impacts under Alternative B would be reduced to less than significant levels, while there would be a single significant and unavoidable impact under Alternative A due to the length of vehicle queues at the Dorsey Drive/State Route 20/49 interchange.

Cumulative impacts to schools are evaluated in Impact 14-10 of Chapter 14, Public Services and Utilities. In accordance with State law, the analysis concludes that cumulative impacts to schools would be less than significant because the Dorsey Marketplace project and all other future projects would be required to pay school impact fees.

Cumulative impacts to libraries are evaluated in Impact 14-12 of Chapter 14. The analysis concludes that the six libraries nearest the City of Grass Valley would be sufficient to serve the projected population of the area under the cumulative scenario, thus the impacts would remain less than significant.

Cumulative impacts to parks are evaluated in Impact 14-14 of Chapter 14. The analysis concludes that impacts would remain less than significant because the City General Plan requires that each project provide parkland or pay an in-lieu fee sufficient to meet the General Plan standards of providing 5 acres of parks and 5 acres of open space for every 1,000 residents.

L-2 The comment states that Mitigation Measures 8a, 8b, 8c, 8d, 8e, 8f, 8g, and 8h are insufficient because they state the developer will pay a fair-share cost for roadway improvements such as restriping, installing a traffic signal, and optimizing signal timing and that these measures will not be sufficient to accommodate the traffic from 1,300 new dwelling units with at least 2 drivers per household added to existing poorly-designed intersections and roadways.

It is noted that the project proposes to construct 90 multi-family apartments under Alternative A and 172 multi-family apartments under Alternative B. It is understood that the comment's reference to 1,300 dwelling units refers to construction of all projects included in the cumulative scenario, not just those proposed on the project site. CEQA requires that the EIR evaluate the effects of the proposed project added to existing conditions and the potential for the project to contribute to significant impacts in the cumulative conditions. CEQA further requires that mitigation measures must be feasible to implement, capable of reducing a specific environmental effect, and roughly proportional to that impact (CEQA Guidelines Section 15126.4).

The improvements required under Mitigation Measures 8a through 8h include:

- Construction of a concrete porkchop barrier,
- Installation of a traffic signal or construction of a roundabout, and
- Traffic signal timing optimization

The TIAR shows that with implementation of these measures the Level of Service (LOS) for all intersections in the "existing plus project" conditions and "cumulative plus project" conditions would remain at acceptable levels under both Alternative A and Alternative B. However, under Alternative A, the TIAR found that the project would contribute to vehicle queues at the Dorsey Drive/State Route 20/49 interchange, where it is not feasible to fully mitigate, and thus the EIR concludes that transportation impacts under Alternative A would be significant and unavoidable.

In the cumulative scenario, the addition of traffic generated by either Alternative A or Alternative B would worsen the delay at intersections that were found to be operating at unacceptable LOS under the "no project" conditions. As such, the project would not create the unacceptable LOS condition. Rather, the unacceptable LOS conditions would exist with or without the project and the addition of project traffic would exacerbate the impact. Since the project is not creating the unacceptable LOS conditions, but exacerbating them, and because most improvements identified in the TIAR are part of the City's Capital Improvement Program, the mitigation measures' requirement for fair share contributions to the identified improvements are appropriate and consistent with the CEQA Guidelines.

Edits have been made to several of the traffic mitigation measures to clarify the requirements and ensure consistency with other recently-approved modifications to the anticipated roadway and intersection configuration, as shown in Chapter 3, Draft EIR Text Revisions.

L-3 This comment quotes text from the Draft EIR and a recent report (the 2019 Rhodium Report) regarding greenhouse gas (GHG) emissions in the US. The comment states that the data from the 2019 Rhodium Report should be added to the EIR to dispel any notion that the problem related to GHG emissions is being resolved.

CEQA provides that the existing conditions at the time the Notice of Preparation (NOP) is published will normally constitute the baseline conditions from which impacts are determined. The NOP for the proposed project was published in February 2016, thus it is appropriate for the Draft EIR to rely on data for the year 2016. Further, the Draft EIR does not rely on the reported decreasing nationwide GHG emissions to support any conclusions regarding the significance of the project's contribution to climate change effects. Rather the impact analysis and significance determination are based on comparison of the project's GHG emissions to statewide emission reduction targets and recommended project-based emissions thresholds. Although it is not required based on the date of publication of the NOP and the date of publication of the Draft EIR, information presented in the Rhodium Group "Taking Stock 2019" report has been added to Draft EIR page 11-5 to provide additional background and context related to GHG emissions. The additional text is shown in Chapter 3, Draft EIR Text Revisions.

L-4 The comment states that California will need a 2.8% reduction in GHG emissions annually to attain the 2030 emission reduction targets, and notes that the emissions resulting from the 2018 California wildfire year are equivalent to the emissions from about one year of power use. The comment states that the project should do all that is possible to not add to these emissions.

The project's contributions to GHG emissions are evaluated in Chapter 11, Climate Change. The analysis is based on the air quality modeling found in Appendix J. The Draft EIR concluded that while both Alternative A and Alternative B would not conflict with the *Nevada County Regional Transportation Plan* and the State of California 2017 *Climate Change Scoping Plan*, both Alternative A and Alternative B would have significant and unavoidable impacts due to the volume of project-generated GHG emissions even after mitigation. The analysis recognizes the project's contribution to city and statewide emissions, mainly from mobile sources (vehicle traffic). Because the project would result in a significant and unavoidable impact associated with GHG emissions, the City of Grass Valley City Council would need to adopt a statement of overriding considerations if the project is approved. It is noted that the California Air Resources Board data shows that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targets, as stated on Draft EIR page 11-35.

The project's risk of wildfire is evaluated in Impact 15-8, which found that both Alternative A and Alternative B would have no impact with regards to increased fire risk because the project would be infill development, the site is surrounded by major roads and is not in a Very High Fire Hazards severity zone. Therefore, neither Alternative A nor Alternative B would increase the cumulative GHG emissions as a result of wildfires in California.

L-5 The comment states that the City and County have recently adopted Energy Action Plans and that both the Draft EIR and the City Energy Action Plan both recognize the same goal of zero net energy for residential buildings in 2020 and for non-residential buildings by 2030.

The City's Energy Action Plan was adopted November 2018. A summary of the Energy Action Plan has been added to Section 11.2 of the Draft EIR, as shown in Chapter 3, Draft EIR Text Revisions.

The California Building Code requires that single-family residences constructed in 2020 or later and non-residential buildings constructed in 2030 or later must be zero-net energy. The comment is correct that these standards are reflected in the City's Energy Action Plan.

L-6 The comment states that the EIR does not include any mitigation that would help reduce GHG emissions from mobile sources and because this impact is significant and unavoidable, the lack of mitigation is an impediment towards approving the project and Draft EIR.

As mentioned in Response to Comment L-4, when a project has a significant and unavoidable impact, the decision-making body must adopt a statement of overriding considerations in order to approve the project, as required by CEQA Guidelines Section 15093. The comment is correct that CEQA requires that all feasible mitigation that could substantially reduce a significant impact must also be adopted. Responses to Comments L-7 through L-10 and L-12 address each of the specific mitigation measures suggestions provided in this comment letter.

L-7 The comment recommends that requiring the project to install Level II charging stations with solar panels would help reduce mobile source emissions.

The comment is correct that use of electric vehicles (EV) would reduce the GHG emissions associated with mobile sources. The US Department of Energy estimates from 2015 indicate that Level II charging stations cost between $400 and $6,500 to install (Department of Energy 2015). Other estimates show that Level II charging stations units cost between $2,000 and $7,000 and installation would cost between 50% to 75% additional (Trigger Energy 2018). A substantial portion of these costs are associated with providing the infrastructure required to support the charging stations. Because installation of EV charging stations is considered feasible and effective at reducing GHG emissions, Mitigation Measure 11a has been updated to require that the project applicant install EV charging stations at 1.5% of the total number of parking spaces constructed. Under either Alternative A or Alternative B, it is expected that the project would construct approximately 925 parking spaces. With the revision to Mitigation Measure 11a, the project applicant would be required to install 14 EV charging stations. This would reduce the project's GHG emissions by approximately 182 metric tons of carbon dioxide equivalents (CO2e) annually, as discussed further in this response and shown in Table 2-1. The project's GHG emissions would still exceed the applicable thresholds and thus the impact would remain significant and unavoidable.

The reduction in GHG emissions from the use of EV was determined based on the Emission Factors (EMFAC) model developed by the California Air Resources Board (CARB), the typical

fuel efficiency of the vehicle fleet in the project area, the driving range of a typical electric vehicle, and the PG&E electricity emission factors. Table 2-1 shows that for each EV charging station installed at the project site and used for 10 hours each day, there would be an annual reduction of 13 metric tons of GHG emissions. Table 2-1 has also been added to Draft EIR Chapter 11 as Table 11-6.

Table 2-1: Quantification of EV Charging Station GHG Emission Reduction

Factor	Amount	Unit
PG&E Electricity Emission Factor[1]	0.25	MT CO_2e/MWh
Fuel Economy of Electric Vehicle[2]	0.25	kWh/mile
Gasoline/Diesel CO_2e Emission while Running[3]	205	g/mile
Annual VMT per Parking Spot[4]	91,250	miles/charging station/year
Number of EV Parking Spots Provided by Project[5]	14	
Annual VMT All Stations (Based on Charge)	1,277,500	miles/year
GHG Emissions of Gasoline/Diesel Vehicle[6]	262	MT CO_2e/year
GHG Emissions of Electric Vehicle[7]	80	MT CO_2e/year
GHG Emissions Reduction[8]	182	MT CO_2e/year
GHG Reduction per Parking Space with Charging per Year	13	MT CO_2e/year

Notes:

1. CO2e weighted intensity factor for PG&E accounts for CO2, CH4, and N2O emission rates consistent with 2020 RPS goal of 33%.
2. US Department of Energy. 2013. Benefits and Considerations of Electricity as a Vehicle Fuel. https://www.afdc.energy.gov/fuels/electricity_benefits.html. Accessed October 2018.
3. California Air Resources Board. 2015. EMFAC 2014. Running exhaust emission rate for CO2 for light duty gasoline- and diesel-powered vehicles for Nevada County, aggregated for all models and speeds, averaged over all seasons for 2022. https://www.arb.ca.gov/emfac/. Accessed September 2019.
4. Annual VMT reduction estimated based on an estimate of 10 hours of charge time for a Level 2 charging station that charges at a rate of 25 miles of driving range per hour.
5. Number of charging stations based on project commitment. This assumes 14 parking spaces would be serviced by a charging station.
6. GHG emissions calculated using annual VMT reduction at all stations.
7. GHG emissions calculated using annual VMT reduction at all stations, fuel economy of electric vehicles, along with PG&E electricity intensity emission factor.
8. GHG emission reduction is a difference of GHG emissions of gasoline vehicles and GHG emissions of electric vehicles.

The EMFAC2017 model also provides data on the types of vehicles used in the region. This data indicates that in the Mountain Counties Air Basin, plugin electric vehicles (PEV) are expected to comprise slightly more than 1% of the total light duty vehicles in 2022 (CARB 2019). This is somewhat lower than other air basins that have greater levels of urban development, such as the Sacramento Valley Air Basin and the San Francisco Area Air Basin. Installation of EV charging stations at rates that greatly exceed the rate of adoption of EV in the project region, and therefore exceed the demand for charging stations, would result in

underutilized charging stations and therefore the amount of GHG reduction that can be attributed to each station would be lessened.

Currently there are 14 EV charging stations available for public use in the City of Grass Valley (PlugShare 2019). Table 2-2 identifies the population, number of EV charging stations, and ratio of EV stations to population for several communities, most of which have similar population to Grass Valley and are located outside of major metropolitan areas. As shown, the ratios range widely, from as low as one station for every 250 people to as high as one station for every 4,700 people. It is also noted that the newest public parking garage in downtown Roseville, which opened in the summer of 2018, has 492 parking spaces total and 6 EV charging stations (1.2% of the parking spaces).

Table 2-2: Population and Existing EV Charging Stations

City	Population[1]	Number of EV Charging Stations[2]	Ratio of Population to EV Charging Stations
Colfax	2,000	8	1 station for every 250 people
City of Auburn and unincorporated North Auburn area	14,103 (City) 13,395 (unincorporated area) 27,498 total	39	1 station for every 705 people
Placerville and unincorporated community of Diamond Springs	11,048 (City) 11,717 (unincorporated area) 22,765 total	32	1 station for every 711 people
Nevada City	3,142	4	1 station for every 785.5 people
Grass Valley	12,914	14	1 station for every 922 people
Fortuna	12,280	13	1 station for every 945 people
King City	14,023	7	1 station for every 2,003 people
Yuba City	66,992	14 existing 4 additional in permitting process	1 station for every 4,785 people Reduced to 1 station for every 3,721 people when additional 4 are installed
Marysville	12,518	2	1 station for every 6,259 people
Olivehurst	13,500	0	0

Sources:

1. CaliforniaDemographics.com, accessed September 2019
2. PlugShare.com, accessed September 2019

As described in the Draft EIR, the Dorsey Marketplace project Alternative A includes 180 parking spaces for the multifamily component and 746 parking spaces for the commercial component. Alternative B includes 395 parking spaces for the multifamily component, 538 parking spaces for the commercial component, and 29 parking spaces for the office use. Title 24, Part 11, Section 4.106.4.2 requires 10% of the total parking for multifamily dwellings to

include the infrastructure necessary to support future installation of EV charging stations. For non-residential, Section 5.106.5.3.3 requires 6% of the parking to be (because the non-residential portion of the project includes more than 200 parking spaces) to be constructed with the infrastructure to support an EV charging station.

Thus under Alternative A, the project would need to provide infrastructure to support future EV charging stations at 18 parking spaces in the residential area and 45 parking spaces in the commercial area; and under Alternative B the project would need to provide infrastructure for future EV charging stations at 40 parking spaces in the residential area, 32 parking spaces in the commercial area, and 2 spaces in the office area. Given the projected rate of EV use in the project region, it is not expected that there would be sufficient demand for charging stations to be installed at all of these parking spaces.

Based on consideration of the projected rate of EV use in the region and the population-to-charging station ratios shown in Table 2-2, Mitigation Measure 11a has been updated to require the project to install EV charging stations at 1.5% of the project's parking spaces (in addition to providing the infrastructure for future charging stations as required by the California Building Code). Under each alternative, this would require installation of 14 charging stations throughout the project site. Mitigation Measure 11a also specifies that the charging stations be distributed throughout the project site so that stations are available for residents, employees, and visitors.

This would double the number of charging stations available in Grass Valley, and reduce the ratio of population-to-EV charging stations to 1 charging station for every 474 people (including the new population residing at the project site), which would drop the Grass Valley ratio well-below most of the communities shown in Table 2-2.

L-8 The comment recommends that the City and project developer provide electric bus shuttles that go between the project site and Sutton Theater, Tri-County Bank, Bank of America, Staples, and Grocery Outlet with a Level III charging station to reduce the project-generated GHG emissions.

As stated on Draft EIR page 8-4, public transit services in the project vicinity are provided by the Nevada County Transit Services Division. The Gold County Stage Route 4 services the Brunswick Basin commercial centers, Sierra Nevada Memorial Hospital, Sierra College, and other locations in the project vicinity. The route travels along Dorsey Drive in front of the project site. Thus the route suggested in this comment would be duplicative of the currently available transit services and would not be expected to substantially reduce use of motor vehicles by project site residents and employees. Since this measure would not substantially reduce project-generated GHG emissions, it is not necessary for the project to implement this as a mitigation measure.

It is expected that all of the heavy-duty vehicles that comprise the public transit fleet throughout the state will be replaced with zero-emission vehicles under CARB's Innovative Clean Transit Regulation, which was adopted in December 2018 to replace the Fleet Rule for Transit

Agencies. The regulation requires all public transit agencies to gradually transition to a 100-percent zero-emission bus fleet and encourages them to provide innovative first and last-mile connectivity and improved mobility for transit riders.

L-9 The comment suggests mitigation measures that could reduce energy usage and the associated GHG emissions. The comment references the requirement in Mitigation Measure 11a that the apartment buildings must be "pre-plumbed and structurally engineered for the installation of a complete solar energy system." The comment states that this measure would be voluntary and there would be no guarantee that solar energy would be installed, that each individual owner would have no way to install solar on the common rooftop, and that the landlord would have no incentive to provide solar unless it is done upfront to reduce rental prices. Thus, the comment suggests that the project should be required to include a community solar installation with each individual dwelling unit meter connected to this installation and that the residences should have all-electric appliances. Additionally, the comment suggests that the project should include backup battery storage to protect residents from rolling blackouts or fire danger. Lastly, the comment states that another option would be to install rooftop solar but that a separate land installation would avoid the need for rooftops to be oriented for the greatest solar exposure and allow light colored roofs that would reflect solar radiation and reduce air conditioning needs.

Draft EIR Tables 11-3 and 11-5 show that energy usage would generate 808 tons of carbon dioxide equivalent (CO2e) emissions annually under Alternative A and 706 tons CO2e under Alternative B. Mitigation Measure 11a includes a wide range of requirements that would reduce energy usage from both the residential and non-residential components of the project. The requirement for buildings to be pre-plumbed and engineered to support a solar system is not voluntary. Further, the California Building Code has been updated since the GHG emissions modeling was completed. Residential projects that are issued building permits on or after January 1, 2020 will be required to install solar panels with sufficient capacity to meet the project's energy demand. The California Energy Commission found that with the updated building code requirements, residences "will use about 7 percent less energy due to energy efficiency measures versus those built under the 2016 standards. Once rooftop solar electricity generation is factored in, homes built under the 2019 standards will use about 53 percent less energy than those under the 2016 standards. This will reduce greenhouse gas emissions by 700,000 metric tons over three years, equivalent to taking 115,000 fossil fuel cars off the road. Nonresidential buildings will use about 30 percent less energy due mainly to lighting upgrades" (California Energy Commission 2018). Because the 2019 California Building Code mandates that the residences constructed at the project site include solar power generation, it is not necessary to include this requirement in Mitigation Measure 11a. The mitigation measure and Draft EIR Tables 11-3 and 11-5, which document the project's operational GHG emissions, have been updated for consistency with the 2019 California Building Code.

Installation of a land-based community solar system would utilize a portion of the project site for this infrastructure, which would reduce the amount of landscaping that could be provided and restrict the ability to plant trees in areas that would shade such a system. This would have

adverse visual effects. Thus the City does not support a requirement to install a land-based community solar system.

L-10 The comment states that natural gas will be phased out over the next few decades and it would be cheaper to build all electric compared to retrofitting the buildings later. Additionally, the comment states that burning gas is a bigger source of GHG emissions than burning coal and nearly 1/3 is burned in homes and commercial buildings. The comment then suggests that a heat pump could replace both the furnace and air conditioning and describes how a heat pump works. The comment also states that induction cooktops are more precise and faster and are superior to gas stoves. While induction stoves are generally more expensive than gas stoves, they are preferable because they don't pollute the indoor air in homes, which could reach levels of nitrogen dioxide and carbon monoxide that would illegal outdoors under the Clean Air Act.

Mitigation Measure 11a requires that the residential buildings meet or exceed CALGreen Tier 1 energy efficiency standards, include tankless water heating, whole house ceiling fan, and "Energy Star" appliances, and other measures to improve energy-efficiency, consistent with the 2019 California Building Code. The building code does not preclude the use of natural gas and the comment does not provide evidence that precluding the use of any natural gas appliances would provide a greater reduction in GHG emissions than what would be achieved under Mitigation Measure 11a. Since the suggested requirement would not substantially reduce project-generated GHG emissions, it is not necessary for the project to implement this as a mitigation measure. There are many factors that must be considered in selecting specific appliances and heating/cooling systems for a residence, including the cost of operation and resident's preferences for cooking.

L-11 The comment states that Impact 11-2 should be revised to reflect the goal of the Grass Valley Energy Action Plan to reduce the projected annual utility-supplied electricity use in 2035 by 36%.

As shown in Chapter 3, Draft EIR Text Revisions, text has been added Chapter 11, Climate Change, Impact 11-2 reflecting the Energy Action Plan's goals and strategies related to electricity use. This addition does not change the impact finding; thus, both Alternative A and Alternative B would have a less than significant impact related to consistency with state and local plans related to reducing GHG emissions.

L-12 In reference to Impact 16-2, which considers whether the project would cause wasteful, inefficient, or unnecessary energy consumption, the comment states that even though growth is anticipated, there are better ways to design projects so that energy use is not wasteful and unnecessary. The comment refers to the specific suggestions in prior comments that would reduce energy use.

The comment emphasizes prior comments regarding suggested mitigation measures that would reduce energy use. Refer to Response to Comment L-9 regarding the more stringent energy-efficiency requirements that the project would be required to meet under the 2019

California Building Code. Also refer to Responses to Comments L-2 through L-11 for discussion of the specific mitigation suggestions. No further response is required.

L-13 In regards to page 16-12, the comment identifies strong support for requiring that solar panels be installed as part of the project.

The text referenced in this comment on Draft EIR page 16-12 did not accurately reflect the requirements of the 2016 California Building Code, which does not require that solar panels be provided. It requires that the buildings be pre-plumbed and structurally engineered to support solar panels. However, as discussed above, the 2019 California Building Code does require installation of solar panels. Refer to Response to Comment L-9 for additional discussion of the required installation of solar panels.

L-14 The comment states that impact 16-3 assumes that local residents would be moving to the project site but actually, it is highly likely that it would be people from outside the area that would therefore increase energy use. The comment states that an alternative that reduced the size of development would be less growth inducing and could encourage development in areas closer to employment centers and thus reduce commutes. Finally, the comment states that if reduced-size projects might not necessarily reduce energy consumption, neither would alternative A and B result in less than significant impacts.

Impact 16-3 discusses the feasibility of more energy efficient alternatives that meet the project's objectives. The analysis does not assume that only local residents would move to the project site. Rather it refers to the anticipated increase in "local demand for housing, employment, and retail/commercial services." In other words, the demand for housing, employment, and services in the region is projected to increase over time. Growth projections for the region include consideration of growth from both the existing population (as children age and move out of their family homes) and from people currently living outside of the area moving into the region. This is consistent with the City's planning documents, namely the Housing Element, which assume both internal and migratory growth. Therefore, it is reasonable to expect that the planned additional population within the City would require housing, employment, and commercial/retail services whether or not these come from the proposed project site.

Additionally, Draft EIR Appendix D, Dorsey Marketplace Economic Analysis, found that there is currently a substantial retail sales leakage of roughly $150 million annually. This suggests that there is already a substantial amount of additional mobile source emissions as a result of people leaving the City to obtain employment and commercial/retail service opportunities. The Economic Analysis found that the proposed project is located on a "prominent site, well-located to attract people driving between the highway and nearby educational, medical, residential and other business commercial activity in Grass Valley" and concluded that under Alternative A the project could capture up to one-third of the retail sales leakage in the area:

"With roughly $150 million in existing retail spending leakage from the western Nevada County market area (in the combined comparison and eating and drinking out categories) and only

small amounts of similar retail supply proposed, the Dorsey Marketplace project provides a site that could accommodate a tenant mix well-positioned to enhance Grass Valley's already strong position in the regional retail market. Dorsey Marketplace sales of $53 million represent about 35 percent of existing retail leakage. Prior retail market assessment for Grass Valley (the Glenbrook Basin Redevelopment Infill Study (2010) and the Buxton Market Overview and Retail Site Assessment (2014) have indicated that a proposal of such a scale would be needed to recapture identified leakage. It is reasonable to expect that the right mix of Dorsey Marketplace tenants would result in existing market area households choosing to shift their shopping patterns—recapturing up to about one-third of market area household spending that is currently lost the market area and instead supporting stabilized operations at Dorsey Marketplace." Compared to Alternative A, Alternative B proposes about 40 percent less retail space and thus would capture less of the market area household spending. Should the proposed project be reduced in size beyond the reduction contemplated in Alternative B, this would further reduce the amount of leakage recaptured by the additional commercial/retail area, which could increase energy consumption compared to Alternative A and Alternative B due to people continuing to travel outside of the area to shop.

The CalEEMod modeling program used to generate the GHG emissions estimates indicates that the average trip length for commercial developments is 6.6 miles (Draft EIR Appendix G). For every shopping trip that remains in the local area rather than traveling to the City of Auburn (approximately 21 miles from the project site), there would be a reduction of 14.4 VMT for one-way travel. The CalEEMod modeling also shows that the commercial portion of the project is expected to generate 7,746 vehicle trips each week day, 9,065 vehicle trips every Saturday, and 4,579 vehicle trips every Sunday. If 1% of the weekend trips replace trips that are currently made to Auburn, there would be 136 trips that remain local, which would reduce VMT by 1,958 miles each weekend, and 101,816 miles annually. This is an approximately 1.2% reduction to the total project VMT and associated energy consumption.

References Cited

California Air Resources Board. 2019. EMFAC2017 Web Database, https://www.arb.ca.gov/emfac/2017/ Accessed September 2019.

CaliforniaDemographics.com. 2019. California Cities by Population. Accessed September 2019

California Energy Commission. 2018. 2019 Building Energy Efficiency Standards. March 2018.

Department of Energy. 2015. Costs Associated With Non-Residential Electric Vehicle Supply Equipment. Prepared by New West Technologies, LLC for the U.S. Department of Energy Vehicle Technologies Office. November 2015.

PlugShare.com. 2019. Accessed September 2019

Rhodium Group, US Climate Service. 2019. Taking Stock 2019. July 2019

Trigger Energy. 2018. How Much Do EV Charging Stations Cost? March 2018. https://triggerenergy.com/how-much-do-ev-charging-stations-cost/

Comment Letter M

Abigail Walker
Community Services Analyst
City of Grass Valley
125 East Main St.
Grass Valley, CA 95945-6505
(P): (530) 274-4714
(F): (530) 274-4399
Abigailw@cityofgrassvalley.com

From: Tom Last
Sent: Tuesday, May 7, 2019 8:05 AM
To: Abigail Walker <abigailw@cityofgrassvalley.com>
Subject: Dorsey EIR

One comment from Tom Ivy from the GV Planning Commission:

The traffic mitigation studies need to include statistical standard deviation. And, all other relevant statistics need to as well.

M-1

Thomas Last | Community Development Director
City of Grass Valley | Community Development Department | 125 E. Main Street | Grass Valley, CA 95945
Phone: (530) 274-4711Email: toml@cityofgrassvalley.com | Web: www.cityofgrassvalley.com

INTENTIONALLY LEFT BLANK

Response to Comment Letter M

Tom Ivy, City of Grass Valley Planning Commissioner
May 7, 2019

M-1 The comment states that the traffic mitigation studies and all other relevant studies should identify the statistic standard deviation.

Standard deviation is a measurement of how widely individual points within a dataset may vary. In the context of the traffic analysis, it is assumed the commenter is requesting the standard deviation of the data that was used to establish the trip generation rates for the proposed project. For this project, the trip generation was determined by averaging the observed conditions at three local shopping centers. This approach is similar to how the Institute of Traffic Engineers trip generation rates are determined; and the Institute of Traffic Engineers handbook is the industry-standard reference source for traffic impact analyses.

Table 2-3 identifies the observed trip generation rates at the three local shopping centers, the population standard deviation of the three data points, and the trip generation rates used for the traffic impact analysis.

Table 2-3: Trip Generation Data Standard Deviation

Location	Size (ksf)	AM Peak Hour Trip Rate	PM Peak Hour Trip Rate
Raley's center	202.85	3.08	5.62
Grocery Outlet center	117.872	3.34	9.2
K-Mart center	163.647	1.99	5.08
Standard deviation		0.585	1.83
Proposed project trip generation (average of three observed data points)		2.80	6.63

Most of the data points are within one standard deviation of the trip generation rate used for the proposed project. Additionally, the trip generation rates used for the proposed project are higher than those published in the Institute of Traffic Engineers handbook. Thus the approach used to determine the project's likely trip generation is reasonable and ensures that the project's traffic volumes and associated impacts have not been understated.

INTENTIONALLY LEFT BLANK

Comment Letter N

Tom Last

From: Janis Berger <busterberger@icloud.com>
Sent: Monday, April 29, 2019 8:26 AM
To: Tom Last
Subject: Dorsey Project

Observation of current conditions would show whole Brunswick area is one big traffic hold up. The deterioration in those conditions even in the developer's plans is UNACCEPTABLE. Then add on increased pollution just from that, destruction of habitat (the reason people are here), increased water and utility demand, the increased stress on empty storefronts and current small businesses and its obvious the only consideration is developer and politician making money. N-1

I AM TOTALLY OPPOSED N-2

Jan Berger
10679 Banner Mine Way

And yes I read the reports.

Sent from my iPad

INTENTIONALLY LEFT BLANK

Response to Comment Letter N

Jan Berger
April 29, 2019

N-1 The comment states that the whole Brunswick area is currently congested and the addition of the proposed project is unacceptable.

The comment does not address the accuracy or adequacy of the Draft EIR. All traffic impacts associated with both Alternative A and Alternative B are evaluated in Chapter 8, Transportation and Appendix G, Traffic Impact Analysis Report. The traffic volume and level of service (LOS) data shown in the Draft EIR demonstrates that there is a noticeable level of congestion in the Brunswick area, with several intersections operating at LOS C and D in the AM and PM peak hours. However, the City's defines LOS D as an acceptable condition. Under existing plus project conditions, both Alternative A and Alternative B would have less than significant impacts with mitigation at all study locations, including those in the Brunswick area. Under cumulative plus project conditions, Alternative B would have less than significant impacts with mitigation while Alternative A would result in a single significant and unavoidable impact due to the vehicle queues at the Dorsey Drive/State Route 20/49 interchange. As shown in Tables 8-6 and 8-7, under existing plus project conditions the level of service on SR 20/49 in the Brunswick area would remain at acceptable levels; and Tables 8-11 and 8-13 show that acceptable levels of service would be maintained in the cumulative plus project conditions. Similarly, as shown in Tables 8-8 and 8-9, under existing plus project conditions, the level of service at intersections in the Brunswick area would remain at acceptable levels; and Tables 8-10 and 8-12 show that Brunswick area intersections would continue to operate at acceptable levels of service in the cumulative plus project conditions.

N-2 The comment states that the project will increase pollution, destroy habitat, increase water and utility demand, and increase stress on empty storefronts and small businesses.

The comment does not address the accuracy or adequacy of the Draft EIR. The environmental concerns raised in this comment are addressed in the EIR:

- Pollution associated with construction and operation are evaluated in Chapter 10, Air Quality and Chapter 11, Climate Change.
- Habitat impacts are evaluated in Chapter 6, Biological Resources.
- Impacts to water and utility usage are evaluated in Chapter 14, Public Services and Utilities.

Impacts on other businesses is not an environmental issue unless it would contribute to a physical environmental effect such as blight. Draft EIR Appendix D contains the Dorsey Marketplace Economic Analysis which found that, "the Dorsey Marketplace project would not depend on cannibalizing from existing retail establishments in Grass Valley" and that "a reasonable shift in market area retail spending patterns in the near term, combined with

moderate growth in the market area over time, provide ample support for the proposed increase in the city's retail inventory". Therefore, it is reasonable to expect that the construction of the proposed project would not lead to empty storefronts and stress on small businesses that could lead to an adverse environmental effect.

Comment Letter O

April 30, 2019

Mr. Tom Last
Community Development Director
City of Grass Valley
125 E Main Street
Grass Valley, California 95945

Subject: Comments on Dorsey Marketplace Draft EIR

Dear Tom:

My comments pertain to Chapter 8 (Transportation) only. They are as follows:

1. To fully understand the cumulative impact of this project on the Dorsey and Brunswick interchanges it is necessary to know what additional development potential is allowed beyond 2035. What percentage of the maximum allowable traffic generation from the Loma Rica Ranch specifically and other allowable development in the City and County is projected in the 2035 analysis? O-1
2. It appears that the project will have a severe impact on the Holiday Center businesses. The driveway to the Center should be analyzed. O-2
3. Left turn pockets on Dorsey and Sierra College Boulevard are frequently blocked by through lane queues. In addition left turn cycles are frequently triggered on East Main when here is no traffic. Was this lost time included in the analysis? O-3

Early traffic studies off the Dorsey Interchange by CalTrans concluded that it would not meet level of service standards unless the interchange signals were well coordinated. This is not the current situation. Specific comments on the project will come once the EIR is certified. O-4

Sincerely,

John W Rumsey
14144 Pierite Road
Nevada City, Ca.
95959

INTENTIONALLY LEFT BLANK

Response to Comment Letter O

John Rumsey
April 30, 2019

O-1 The comment states that the analysis of cumulative impacts should consider development potential beyond 2035 and asked what percentage of the maximum allowable traffic from Loma Rica Ranch and other allowable development in the region is reflected in the cumulative traffic volumes.

As discussed in Response to Comment B-2, the Traffic Impact Analysis Report (TIAR), which is provided in Appendix G, and the Draft EIR evaluated cumulative impacts under the year 2035 to be consistent with the Nevada County Travel Demand Model. The Nevada County Travel Demand Model includes the Loma Rica Ranch and other growth anticipated under the Grass Valley General Plan as well as the Nevada County General Plan.

O-2 The comment states that the project will impact the Holiday Center businesses and the driveway to the center should be analyzed.

The closest intersection the Holiday Center businesses is the Dorsey Drive/Main Street intersection, thus this intersection has the greatest potential to affect the Holiday Center businesses. The TIAR (Appendix G) evaluated the impact to the Dorsey Drive/Main Street intersection. As discussed in Impact 8-2 in Chapter 8,Transportation, Alternative A would result in a 0.5 second increase in delay during the AM peak hour period and a 4.5 second increase in delay during the PM Peak hour period. Alternative B would result in a 0.2 second increase in delay during the AM peak hour period and a 1.2 second increase in delay during the PM peak hour. Neither Alternative A nor Alternative B would cause any changes to the level of service (LOS) during the AM and PM peak hours. Because the intersection LOS would not change, it is not expected that the project, under either alternative, would significantly impact the driveways to the business center. Traffic would continue to move along Dorsey Drive and through the intersection such that access to the Holiday Center driveway on Dorsey Drive would be available.

O-3 The comment states that the left turn pockets on Dorsey Drive and Sierra College Boulevard are frequently blocked and that unnecessary left-turn cycles are frequently triggered on East Main Street. The comment asks whether the lost time from these conditions was included in the analysis.

As defined in the TIAR, LOS is the average values for all intersection movements for signalized intersections and all-way stop-controlled (AWSC) intersections and delay resulting from the worst approach two-way stop-controlled (TWSC) intersections. The increased time required for a vehicle's movement through an intersection because of the inability to access a left-turn lane pocket due to through-lane queueing is reflected in the TIAR as represented by a higher average delay for these movements.

O-4 The comment states that earlier reports by Caltrans concluded that LOS at the Dorsey Drive interchange would be unacceptable without interchange signal coordination, which is not provided currently. The comment also notes that comments regarding the project design will be provided once the EIR is certified.

The analysis in the TIAR and Draft EIR are generally consistent with this comment in that the analysis finds that Alternative A would cause the Dorsey Drive/SR 20/49/Joerschke Drive intersection to operate at LOS F in the PM Peak hour under cumulative conditions. The Draft EIR and TIAR show that under Alternative B, the intersection would continue to operate at an acceptable LOS D.

As discussed in Impact 8-9 of Chapter 8, Transportation, Alternative A would result in a significant and unavoidable due to adverse effects to traffic flow and safety at the Dorsey Drive interchange resulting from vehicle queues that exceed the available storage and can adversely affect operation of roadway facilities. Alternative B would also contribute to vehicle queuing but would result in shorter queues than Alternative A. Mitigation Measure 8d requires the project applicant to provide funding for signal timing optimization at this intersection, which is expected to restore the intersection operations to LOS D or better and ensure that vehicle queues are not long enough to interfere with operation of adjacent roadways and intersections.

Comment Letter P

Katherine Waugh

From: Abigail Walker <abigailw@cityofgrassvalley.com>
Sent: Friday, May 3, 2019 8:20 AM
To: Katherine Waugh
Subject: FW: Dorsey Marketplace

More Dorsey Comments..

Thank you ☺

Abigail Walker
Community Services Analyst
City of Grass Valley
125 East Main St.
Grass Valley, CA 95945-6505
(P): (530) 274-4714
(F): (530) 274-4399
Abigailw@cityofgrassvalley.com

From: Deborah Gibbs <heronviewranch@sbcglobal.net>
Sent: Thursday, May 2, 2019 5:32 PM
To: Tom Last <toml@cityofgrassvalley.com>
Subject: Dorsey Marketplace

Dear Mr. Last:

I appreciated the information provided at the recent EIR meeting. The proposed development option that offers the most housing seems like an appropriate choice given the serious need for homes in our community. P-1

Of greater concern to me was the amount of space given to retail. Ideally this space would be available first to our local business owners instead of big box stores that bring very little revenue into the community. We should keep our dollars in Nevada County. P-2

Of most concern was the proposal for drive through restaurants. We have a least a dozen already, and these restaurants most often offer food that it is less nutritious than other food service. At a time when we are trying to improve the diet of our population, and foster a community that provides its citizens with opportunities, this plan falls short. And to me it seems inconsistent with the Grass Valley Strategic Plan, such as:

4.B.4. Provide opportunities for emerging/non-traditional retail and technology startup businesses. Seek funding sources for small business startups and provide specialized small business assistance via convenient and user-friendly permitting and approval processes at the City.

It would be very desirable to use this space for some innovation instead of drive through restaurants that offer little and simply increase traffic congestion and pollution. A small business park would be an improvement over these restaurants. And perhaps the employees might actually be able to walk from the housing to the workplace. P-3

Thank you for the opportunity to comment and for all the work the City is doing to make Grass Valley a great community.

Sincerely,

Debbie Gibbs
13249 Kentucky Flat Rd.
Nevada City, CA 95959

INTENTIONALLY LEFT BLANK

Response to Comment Letter P

Deborah Gibbs
May 2, 2019

P-1 The comment notes appreciation for the information provided at the EIR meeting and states that the project option with the most housing would be appropriate due a need for housing in the area.

The comment does not address the accuracy or adequacy of the Draft EIR or the project's environmental effects. The EIR evaluated both Alternative A and Alternative B at an equal level of detail. Of the two, Alternative A offers more retail and Alternative B offers more residential. The City Council may opt to approve either of these Alternatives with no need for additional environmental review.

The EIR also analyzed five additional alternatives that include varying ranges of residential uses: Alternative 1a: No Project/No Build, Alternative 1b: No Project/Existing Designations, Alternative 2: Reduced Development, Alternative 3: Vertical Mix Use, and Alternative 4: Tiered Alternative.

Meeting minutes for the April 16, 2019 Planning Commission Meeting can be found at the City's website: http://www.cityofgrassvalley.com/files/attachments/agendas-2014/4-16-19_minutes.pdf

P-2 The comment suggests that the business space should be offered first to local business owners and expresses concern regarding the potential for big box stores to locate within the project site.

Appendix D provides the Economic Analysis prepared for Dorsey Marketplace which states that the "evaluation of project characteristics indicate that the Dorsey Marketplace project would not depend on cannibalizing from existing retail establishments in Grass Valley" and that "a reasonable shift in market area retail spending patterns in the near term, combined with moderate growth in the market area over time, provide ample support for the proposed increase in the city's retail inventory." The DEIR analyzed two options: Alternative A, which offers more retail, and Alternative B, which offers more residential. The specific tenants of commercial/retail space does not relate to the project's environmental effects and thus not analyzed in the environmental document.

P-3 The comment states that there are already enough fast food restaurants (which tend to provide lower nutritional value than other food types) and that the inclusion of fast food restaurants is inconsistent with the Grass Valley Strategic Plan, particularly Policy 4.B.4. The comment suggests that the pads be used for more innovative businesses that would result in less traffic and pollution.

The proposed project design includes three small retail pads with drive-through lanes. These could support fast food or other uses, such as banks and coffee shops. As discussed in

Response to Comment J-9, the analysis of traffic impacts included an estimate of the traffic that would be generated by the project based on observed traffic volumes at three local shopping centers. The traffic modeling and analysis provides a reasonable estimate of vehicle traffic based on the observed trip generation rates at three nearby shopping centers that are reflective of the range of uses allowed within a shopping center and typical to the project region. The three local shopping centers' peak hour traffic was averaged to derive peak hour trip rates that were then applied to the project square footage. These three shopping centers cover the entire breadth of the uses noted in the comment and as such account for the range of traffic patterns expected to occur from a wide variety of retail uses. The comment is correct that fast-food restaurants with drive-through lanes have higher trip generation rates than some other businesses; however this is adequately reflected in the TIAR and Draft EIR.

Comment Letter Q

Abigail Walker

From: Tom Last
Sent: Monday, May 6, 2019 9:57 AM
To: Abigail Walker
Subject: FW: DMP Comments

Thomas Last | Community Development Director
City of Grass Valley | Community Development Department | 125 E. Main Street | Grass Valley, CA 95945
Phone: (530) 274-4711Email: toml@cityofgrassvalley.com | Web: www.cityofgrassvalley.com

From: Warren Hughes <WHughes@gallellire.com>
Sent: Monday, May 6, 2019 9:46 AM
To: Tom Last <toml@cityofgrassvalley.com>
Subject: DMP Comments

Hi Tom – Obviously, today is the last day for comments on the DEIR. I have just two comments.

- Replace the term Fast Foods drive thrus with term Drive thru pad buildings. These tenats will not necessarily be fast food users. Q-1
- Replace the picture on the cover as it actually has old mining equipment shown that is not on our property. Q-2

Also, are we set for 5/28 for the first DRC meeting? Will it be a combined meeting with the Planning Commission and City Council members?

Thanks...WH

WARREN B. HUGHES
Vice President
3005 Douglas Blvd., #200, Roseville, CA 95661
916 997 0110
whughes@gallellire.com
BRE LIC #01106026
www.gallellire.com

GALLELLI REAL ESTATE

1

INTENTIONALLY LEFT BLANK

Response to Comment Letter Q

Warren Hughes
May 6, 2019

Q-1 The comment states that the term fast food drive thru should be replaced with drive thru pad buildings.

This comment offers a clarification on the project description. The Draft EIR correctly identified that the pads that include drive-through lanes would not be restricted to fast food uses in the second paragraph on page ES-5 (describing Alternative B). As shown in Chapter 3, Draft EIR Text Revisions, the text in the first paragraph on this page, describing Alternative A, has been revised to clarify the range of potential uses of the pads with drive-through lanes. This change does not alter the environmental impact analysis, conclusions, or mitigation measures throughout the Draft EIR.

Q-2 The comment states that cover photo should be replaced because it shows land and features that are not within the project site. The comment asks for confirmation regarding the DRC meeting date and if it will be a combined meeting with the Planning Commission and Council Members.

An alternate photograph is used on the cover of this Final EIR. The comment is correct that the photograph on the cover of the Draft EIR includes a portion of area that is outside of the project site boundaries, however it also includes the project site and is representative of the topographic and vegetative conditions of the site.

The Development Review Committee meeting is intended to focus on the details of the project design and is not part of the environmental review process under CEQA.

INTENTIONALLY LEFT BLANK

Comment Letter R

SOLURI MESERVE
a law corporation

tel: 916.455.7300 · fax: 916.244.7300
510 8th Street · Sacramento, CA 95814

June 3, 2019

SENT VIA EMAIL (toml@cityofgrassvalley.com)

Thomas Last
Community Development Director
City of Grass Valley
125 E. Main Street
Grass Valley, CA 95945

RE: Dorsey Marketplace Draft Environmental Impact Report
SCH # 2016022053

Dear Mr. Last:

These comments on the Draft Environmental Impact Report ("DEIR") for the Dorsey Marketplace project ("Project") are submitted on behalf of Protect CEQA and its members. Formed in 2014, Protect CEQA is a statewide coalition of environmentalists, labor members, and concerned residents committed to protecting the California Environmental Quality Act, open space preservation, and promoting smart growth development.

The DEIR is fundamentally inadequate, and fails as an informational document in several areas such as traffic and transportation, air emissions and resulting human health impacts, noise emissions and resulting health impacts, hazardous materials, biological resources, public services and utilities, and cumulative impacts. Indeed, in certain instances the DEIR's information is inconsistent with the DEIR's own technical reports. In one instance the DEIR is actually internally inconstant. R-1

In order to remedy the deficiencies described below, the City of Grass Valley ("City") must undertake additional analysis and mitigation of the Project's significant impacts on the environment and thereafter recirculate the Draft EIR.

I. THE DEIR FAILS AS AN INFORMATIONAL DOCUMENT BECAUSE IMPACTS AND THE EFFECTIVENESS OF MITIGATION MEASURES ARE NOT ADEQUATELY EXPLAINED

CEQA sets a high bar for evaluating impacts and the Draft EIR falls short. The "fundamental purpose of an EIR is 'to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on R-2

the environment.'" (*Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 428, citing Pub. Resources Code, § 21061.) In order to serve this purpose, the EIR must "present information in such a manner that the foreseeable impacts of pursuing the project can actually be understood and weighed, and the public must be given an adequate opportunity to comment on that presentation before the decision to go forward is made." (*Ibid.* at pp. 449-450.)

Under section 15088.5 of the CEQA Guidelines, recirculation of an EIR is required when "significant new information" is added to the EIR after public review but prior to certification of the FEIR. The term "information" can include changes in the project or environmental setting, as well as additional data or other information. "Significant new information" requiring recirculation may include a disclosure showing that new or more severe significant impacts would result, that feasible mitigation that would address impacts is not being adopted, or that the DEIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded. The new information and clarifications required to respond to the DEIR's flaws as identified in this comment letter will require recirculation of the DEIR for a new round of public comment.

R-2 Cont.

In general, the mitigation measures in the DEIR are stated without any explanation about their effectiveness, except a conclusion that they are effective. CEQA requires more. Because the public must be able to understand, evaluate, and respond to conclusions in an EIR, the document must contain facts and analysis disclosing the analytical route the agency traveled from evidence to action, not just the agency's bare conclusions and opinions. (*Save Our Peninsula Committee v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 118.) Meaningful assessment of a proposed mitigation measure requires that the potential impact be clearly identified and quantified, if possible. The Draft EIR must then describe the mitigation measures and explain why they will work to the degree that the EIR concludes the measures will work. (*California Clean Energy Committee v. City of Woodland* (2014) 225 Cal.App.4th 173, 203.) Similarly, the DEIR should explain its conclusions that no mitigation is necessary, or that no mitigation is available. As set forth more fully below, the City must revise the DEIR to provide this analysis.

R-3

II. THE PROJECT DESCRIPTION IS INADEQUATE

The DEIR neglects to evaluate the whole of the proposed Project. Under CEQA, a project is defined as "the whole of the action" that may result in either a direct or reasonably foreseeable indirect physical change to the environment. (Pub. Resources Code, § 21065; CEQA Guidelines, § 15378, subd. (a).) This broad definition of "project"

R-4

is intended to maximize protection of the environment. (*McQueen v. Bd. of Directors of the Mid-Peninsula Regional Open Space Dist.* (1988) 202 Cal.App.3d 1136, 1143 (disapproved on other grounds); *Tuolumne County Citizens for Responsible Growth v. City of Sonora* (2007) 155 Cal.App.4th 1214, 1223.) In performing its analysis, a lead agency must not "piecemeal" or "segment" a project by splitting it into two or more segments. (CEQA Guidelines, § 15165.) This approach ensures "that environmental considerations [do] not become submerged by chopping a large project into many little ones, each with a potential impact on the environment, which cumulatively may have disastrous consequences." (*Burbank Glendale Pasadena Airport Authority v. Hensler* (1991) 233 Cal.App.3d 577, 592; *Bozung v. Local Agency Formation Commission* (1975) 13 Cal.3d 263, 283-284.)

The DEIR's project description is very light on the details of the project such as whether the onsite mine waste and tailings contain hazardous materials that could affect nearby residents, whether the Project site contains protected plant species that might affect the Project's development plan, or the configuration of necessary commercial and mechanical facilities that will affect noise impacts for future Project residents. The lack of detail precludes meaningful analysis of impacts in the remainder of the document. These details are critical to a meaningful analysis of impacts. In short, the DEIR provides a legally inadequate analysis of the potential impacts of the project because it is based on an incomplete and inconsistent project description. "An accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR." (*San Joaquin Raptor / Wildlife Rescue* Center *v.County of Stanislaus* (1994) 27 Cal.App.4th 713, 730, quoting *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193.) Courts have found that even if an environmental document is adequate in all other respects, the use of a "truncated project concept" violates CEQA and mandates the conclusion that the lead agency did not proceed in a manner required by law. (*San Joaquin Raptor / Wildlife Rescue Center*, *supra*, 27 Cal.App.4th at 730.) Furthermore, "[a]n accurate project description is necessary for an intelligent evaluation of the potential environmental effects of a proposed activity." (*Id.* at p. 730 [citation omitted].) "[D]ecision makers and [the] general public should not be forced to . . . ferret out the fundamental baseline assumptions that are being used for the purposes of environmental analysis." (*San Joaquin Raptor*, *supra*, 149 Cal.App.4th at p. 659.) Thus, an inaccurate and incomplete project description renders the Draft EIR's analysis of potentially significant environmental impacts inherently unreliable.

R-4 Cont.

III. THE DEIR'S ANALYSIS AND MITIGATION OF POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS IS INADEQUATE

A. The DEIR Fails to Provide Adequate Information Regarding Impacts and Proposed Mitigation for the Project's Transportation and Traffic Impacts

The EIR's analysis of transportation impacts fails as an informational document because its analysis is inconsistent with its own traffic study, it fails to adequately mitigate project-level impacts, and it fails to provide necessary information regarding a proposed "fair share" mitigation strategy.

The DEIR acknowledges that the Project will result in significant project-level impact at intersection 12 (62 second increased delay) and 16 (9.5 second increased delay). (DEIR pp. 8-18 – 20.)[1] The DEIR violates CEQA, however, by not setting forth all feasible measures to mitigate this project-level impact. The DEIR only provides "fair share" funding for the identified mitigation to address this impact. Violating *Anderson First Coalition v. City of Anderson* (2005) 130 Cal.App.4th 1173 ("*Anderson First*"), the DEIR does not identify the Project's "fair share" contribution to the improvement. Any "fair share" percentage lower than 100 percent violates CEQA because Table 8-8 establishes that the Project is solely responsible for significant project-level increased delays at those two intersections, and requiring the developer to be solely responsible to mitigate that project-level impact does not violate the requirement that mitigation be "roughly proportional." (CEQA Guidelines, § 15126.4, subd. (a)(4)(B).)

R-5

To the extent the City maintain its unlawful "fair share" mitigation for these project-level impacts, the DEIR violates CEQA for the separate and independent reason that the DEIR fails to provide necessary information about the proposed "fair share" strategy. The payment of a "fair share" impact fees may constitute adequate mitigation if they "are part of a reasonable plan of actual mitigation that the relevant agency commits itself to implementing." (*Anderson First*, *supra*, 130 Cal.App.4th 1173.) But the payment of a "fair share" impact fee is not adequate mitigation when (as here) there is no evidence that the payment of the fee will actually result in mitigation of a project's significant environmental impacts. The *Anderson First* decision identified the information that is required in an EIR to establish the adequacy of a "fair share" mitigation measure. The required elements from the *Anderson First* decision include:

R-6

[1] Footnote re: one additional project trip as threshold per traffic study, but that typical practice is 5 additional seconds delay.

(i) An identification of the required improvement;
(ii) An estimate of the cost of the required improvement;
(iii) Sufficient information to determine how much the project would pay towards the improvement; and
(iv) The fees must be part of a reasonable, enforceable plan or program sufficiently tied to the actual mitigation of the impacts at issue.

(*Anderson First, supra*, 130 Cal.App.4th at 1188-89.)

Here, the DEIR falls well short of providing this information regarding the improvements identified in these above mitigation measures. Instead, the DEIR simply identifies the proposed improvement and states that the project applicant will "pay a fair share contribution towards this improvement." (DEIR, p. 8-20.) While the DEIR on page 14-41 suggests that the City has capital improvement program, there is no information indicating that this "porkchop" improvement is included in that program. No cost of the improvement is provided. No formula to actually determine the "fair share" contribution is provided. The amount of the "fair share" is not provided. There is no explanation how these "fair share" fees are tied to an enforceable plan or program that will ultimately result in the proposed improvement. The DEIR's failure to provide this critical information about the identified "fair share" mitigation measure means that DEIR fails as an informational document. (*Anderson First, supra*, 130 Cal.App.4th at 1188-89.)

R-6 Cont.

The DEIR also fails as an informational document because its analysis of project-level impacts and mitigation for intersection 12 is completely inconsistent with the DEIR's technical study. First, the DEIR asserts that the project will increase PM peak hour delay by 62 seconds, (DEIR, pp. 8-19 – 20) whereas the technical study states that the increased delay is only 35.5 seconds. Second, the identified mitigation is different. The technical study proposes (i) installing a traffic signal, or (ii) closing the intersection altogether. (DEIR App. G, p. 36) Neither of these mitigation measures are discussed in the EIR, which instead discusses "more effectively prevent[ing] illegal movements by installing a larger "porkchop" barrier. (DEIR, p. 8-20.) While the technical study states that installing a traffic signal will effectively mitigate the impact, there is no supporting analysis describing what post-mitigation conditions would be with the larger "porkchop," or how the larger "porkchop" will decrease delay. Thus, substantial evidence does not support the effectiveness of the DEIR's proposed mitigation.

R-7

There also appears to be internal inconsistencies in the description of project-level and cumulative conditions. Put another way, cumulative conditions appears to be based on an unreasonable trip distribution assumption. The DEIR's technical report states, "Based on information from City of Grass Valley staff and consistent with the Loma Rica

R-8

EIR, the intersection of Brunswick Road and Idaho Maryland Road is assumed to be improved to allow full access in Cumulative conditions." (DEIR App. G, p. 17.) The DEIR does not explain how this assumption is feasible. The "Loma Rica EIR" is not tiered from or incorporated by reference in accordance with CEQA's procedural mandates. Further, and more importantly, the express purpose of mitigation measure 8a is to ensure that movements continue to be restricted at that intersection. (DEIR, p. 8-20.) If restricting movements at that intersection is mitigation for project-level impacts, then what happens when that mitigation is removed? Put another way, how can one assume full access under cumulative conditions when project-level mitigation is to more rigorously enforce limited access? When is the mitigation measure supposed to be eliminated? The EIR fails as an informational document by failing to address this obvious inconsistency.

R-8 Cont.

There is yet another inconsistency between the DEIR and the technical study regarding mitigation for intersection 16. The DEIR states that mitigation (measure 8b) includes "either a traffic signal or roundabout," (DEIR, p. 3-39) yet the technical study (DEIR, App. G p. 38) proposes only a traffic signal. Thus, there is no information regarding the effectiveness of a roundabout at that intersection.

R-9

B. The DEIR Fails to Analyze Toxic Air Contaminants and Resulting Human Health Impacts

The DEIR fails as an informational document because it provides no meaningful analysis for either operational or construction-related emissions of toxic air contaminants ("TACs") and their associated health risks.

1. Operational Impacts to Future Project Occupants

Operational emissions of TACs associated with the Project include diesel particulate matter ("DPM") and ultrafine particulate ("UFP") emissions to future Project occupants resulting from their extreme proximity to state route 20/49. The DEIR needs to address this health issue to future occupants of the Project because the DEIR acknowledges that the Project will exacerbate TAC emissions by adding additional vehicles on the roadways including state route 20/49. (*California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal.4th 369, 377 ("[W]hen a proposed project risks exacerbating those environmental hazards or conditions that already exist, an agency must analyze the potential impact of such hazards on future residents or users").)

R-10

Despite being located literally next to state route 20/49, the DEIR does not address this issue at all. The DEIR does not even mention state route 20/49 as an emission source for future Project occupants, much less quantify those TAC emissions or correlate those TAC emissions to actual health risks, if feasible, as required by *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502, 522 (*Sierra Club*). Further, while it might be tempting to limit the recirculated DEIR's discussion to just acute and chronic (i.e. cancer) impacts, recent scientific literature reveals many other health risks resulting from TAC emissions.

Diesel exhaust is not only linked to increase cancer risk as a TAC, but also to physical changes in children's brain structure, and mental issues due to prenatal exposure. (Exhibit 1, Cahill, Ch. 7, p. 68.) Large trucks are a primary source of diesel emissions. (See Exhibit 1, Cahill, Ch. 7, pp. 70-71.) The decision to not consider mobile TAC sources such as diesel engines is all the more dubious because it accounts for 70 percent of all airborne toxic effects of TACs combined. (Exhibit 1, Cahill, Ch. 7, p. 68.)

R-10 Cont.

Beyond diesel exhaust, UFPs are another air quality impact not discussed in the DEIR. UFPs, particles with diameters less than 0.1 micrometers, are comprised mostly of metals that are known constituents of brake pads and drums, as well as additive in motor oil. (Exhibit 1, Cahill, Ch. 8, p. 80.) Generally, all engines can create UFPs, but especially diesel engines, and any vehicle's braking system. (Exhibit 2, Cahill, Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 1: 2003–2007, p. 1130.) Traffic, particularly start-and-stop, generates UFPs. (See Exhibit 2, Cahill, Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 1: 2003–2007, p. 1131.) Recent research suggests that UFPs pose considerable health risks, such as increased risk of cardio-vascular disease and ischemic heart disease death rates, and loss of lung function. (Exhibit 3, Cahill, Artificial ultra-fine aerosol tracers for highway transect studies, pp. 31-32; see also Exhibit 4, Cahill, Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 2: 1974–1991; Exhibit 2, Cahill, Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 1: 2003–2007.) "The strongest correlations to [ischemic heart disease] mortality were found in very fine . . . to ultrafine metals, with most tied to vehicular sources." (Exhibit 2, Cahill, Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 1: 2003–2007, p. 1133.) Prenatal proximity to freeways and exposure to UFPs may be causally linked to increased autism rates in children. (Exhibit 5, Volk, Residential Proximity to Freeways and Autism in the CHARGE Study, p. 875.) Unlike diesel exhaust or other larger TAC emissions, UFPs are more persistent and do not dissipate easily over distances. (Exhibit 6, Cahill, Transition metals in coarse, fine, very fine and ultra-fine particles from an interstate highway transect near Detroit, pp. 340-341.)

R-11

The DEIR does not ever mention UFPs as a potentially significant air quality impact and therefore fails as an informational document. In additional to acknowledging these TAC emissions that will be exacerbated by the Project, the recirculated DEIR will need to measure those emissions and correlate those emission levels to identified health risks, if feasible. If not feasible, the recirculated DEIR will need to explain why so. The DEIR correctly acknowledges (DEIR, p. 10-11) the relevance of the recent California Supreme Court decision in *Sierra Club*, *supra*, 6 Cal.5th at 522, which explains, "EIR must provide an adequate analysis to inform the public how its bare numbers translate to create potential adverse impacts or it must adequately explain what the agency does know and why, given existing scientific constraints, it cannot translate potential health impacts further." Here, the City has not even attempted to inform the public of the "bare numbers" with respect to mobile TACs or UFP emissions, let alone translate those numbers into quantifiable adverse impacts. The failure to do so is inexcusable given that recent scientific studies demonstrate that it is feasible to correlate TACs and UFP emissions levels to resulting human health risks.

R-11 Cont.

The revised DEIR will need to include a full TAC analysis as required by *Sierra Club* to understand the nature and extent of these impacts on future Project occupants. We caution against stunts intended to sidestep the City's duty of full disclosure. For example, the City cannot rely on the absence a significance threshold or other CEQA guidance from the Northern Sierra Air Quality Management District ("NSAQMD") as an excuse to avoid analyzing mobile source TAC emissions and health impacts. "[A] threshold of significance cannot be applied in a way that would foreclose the consideration of other substantial evidence tending to show the environmental effect to which the threshold relates might be significant." (See *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1109 (*Amador Waterways*).) Similarly, a lead agency has a duty to inform itself about available methodologies for assessing an impact. (*Berkeley Keep Jets Over the Bay Comm. v. Board of Port Comm'rs* (2001) 91 Cal.App.4th 1344, 1367 (*Berkeley Keep Jets*).) While the NSAQMD's CEQA Guidelines, seemingly last updated in 2009, might not address impacts to residential receptors located nearby roadways, such guidance is readily available. Just one such example is from a screening health risk assessment prepared by the City's own consulting firm, Dudek, for a project located in Pleasanton. (Exhibit 7, Dudek memo.) "[I]n preparing an EIR, the agency must consider and resolve every fair argument that can be made about the possible significant environmental effects of a project, irrespective of whether an established threshold of significance has been met with respect to any given effect." (*Ibid.*) Here, there is a fair argument that future Project occupants would have potentially significant air quality and related health impacts from mobile TAC emissions and UFP emissions, and methodologies exist to meaningfully quantify emissions and correlate such emissions to possible human health impacts.

R-12

2. Construction TAC Emissions

While the DEIR purports to address construction-related TAC emissions, it does so in a cursory and impermissible manner. (DEIR, pp. 10-27 – 28.) Put simply, construction of the Project will generate TAC emissions that may have a potentially significant impact on the many residences that are in close proximity to the Project site. The DEIR must perform a meaningful analysis of that health risk to adjacent residents.

The DEIR's analysis of Impact 10-4 is woefully deficient. The DEIR does not quantify TAC emissions from construction equipment and merely offers broad generalizations. (DEIR, pp. 10-27 – 28.) Again, the DEIR makes an unsubstantiated assertion that "Due to the relatively short period of exposure at any individual sensitive receptor and minimal particulate emissions generated on site, TACs generated during construction would not be expected to result in concentrations causing significant health risks" (*Ibid.*) Even if construction would be short term, construction emissions can still have potentially chronic effects (i.e. cancer risk) as well as short term effects (i.e. acute or "non-cancer" risks) that can be measured by a "hazard index." NSAQMD guidance, dated 2008, states, "The impacts of hazardous air pollutants such as diesel exhaust and asbestos should be evaluated" (p. 8.) While the NSAQMD guidance has not been updated and therefore does not provide any more updated and refined guidance, such guidance is available from other air districts with much more updated and refined CEQA Guidance. (Exhibit 8, SMAQMD CEQA Guidelines; Exhibit 9, BAAQMD CEQA Guidelines, pp. 8-7–8-8).) Again, the City cannot dismiss this guidance by claiming that it is within NSAQMD jurisdiction because a lead has a duty to inform itself about available methodologies for assessing an impact. (*Berkeley Keep Jets*, *supra*, 91 Cal.App.4th at 1367.)

R-12 Cont.

The current BAAQMD Guidelines describe the minimum information necessary regarding TAC emissions from construction activities:

> The analysis shall disclose the following about construction-related activities:
> 1. Types of off-site receptors and their proximity to construction activity within approximately 1,000 feet;
> 2. Duration of construction period;
> 3. Quantity and types of diesel-powered equipment;
> 4. Number of hours equipment would be operated each day;
> 5. Location(s) of equipment use, distance to nearest off-site sensitive receptors, and orientation with respect to the predominant wind direction;

6. Location of equipment staging area; and
7. Amount of on-site diesel-generated PM2.5 exhaust (assuming that all on-site diesel PM2.5 exhaust is diesel PM) if mass emission levels from construction activity are estimated.

(Exhibit 7.)

R-12 Cont.

The above information represents the minimum necessary to assess the chronic and acute health impacts associated with construction TAC emissions.

3. Naturally-Occurring Asbestos

The DEIR states, "According to the NSAQMD, no naturally occurring asbestos (NOA) has been mapped in the project area." (DEIR, p. 10-28.) This is misleading since the EIR's geotechnical engineering report states, "Based on the ultramafic and serpentine rock observed onsite and our past experience with serpentine rock in the area, we anticipate naturally-occurring asbestiform minerals may be encountered during grading." The EIR must serve its purpose as an informational document and discuss the implications of grading and construction in an area of NOA, and not merely state that the applicant will comply with all applicable rules. In fact, there is no explanation for why this analysis is deferred. The earlier Preliminary Endangerment Assessment ("PEA"), dated 2008, states:

> Based on the local geology, naturally occurring asbestos (NOA) may be encountered at the site during remediation and site development. In the Sierra Nevada foothills area, ultramafic rock and serpentine are associated with NOA minerals such as chrysotile, actinolite, and tremolite. Under California law, disturbance of soil and rock that contain ultramafic rock, serpentine or NOA minerals must be handled as described in Cal/EPA Air Resources Board Regulation 93105, Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations (ATCM). Per the ACTM, site work must be performed according to protocols established by an Asbestos Dust Mitigation Plan (ADMP). An ADMP outlines engineering controls to reduce the risk of release of NOA fibers into the environment during mechanical soil disturbance. Mechanical soil disturbance includes site clearing, grading, underground utility work, transportation, and disposal activities.

R-13

Since the potential for NOA has been known since at least 2008, there is no excuse for not already having performed the testing to determine whether NOA is present. This constitutes impermissibly deferred analysis (i.e. not deferred mitigation, which is sometimes allowed) in violation of CEQA. Further, the DEIR will need to satisfy the *Sierra Club* decision requiring correlation of air emissions and health conditions. This is particularly true since the Project construction will generate both DPM and asbestos emissions for nearby receptors, which aggregate for purposes of impacting human health. R-13 Cont.

C. The DEIR Impermissibly Defers Disclosure of Human Health Risks Resulting from Known Hazardous Materials

The DEIR fails to address the potential human health impacts resulting from all aspects of the Project. (CEQA Guidelines, § 15378 (project subject to review includes the "whole of an action").) The PEA states, "The RAW recommends excavation and off-site disposal for the waste in AOC 1. Mine waste rock and tailings in AOC 2 are considered suitable for on-site consolidation and burial beneath the proposed commercial development" To the extent this activity is proposed as part of this Project, the impacts need to be addressed—including a specific identification of all human exposure pathways. Sufficient information must be disclosed in the DEIR about this remediation strategy to prepare a site-specific health risk assessment. Without one, the impact of on-site containment cannot be assessed against the alternative of off-site disposal. R-14

Rather than comply with CEQA's informational mandates, the DEIR essentially defers all analysis of impacts to compliance with the Remedial Action Workplan ("RAW"), and therefore fails as an informational document. While the DEIR purports to briefly summarize what the RAW and Asbestos ATCM require, there is no attempt to assess the effectiveness of these measures or quantify the post-mitigation emissions (in the case of asbestos) or health risk (in the case of arsenic and heavy metals).

Again, the issue of quantifying asbestos emissions is particularly significant because different TAC emissions aggregate for purposes of human health impacts. Here, neighbors will be exposed to both DPM and asbestos emissions during Project construction. To the extent those two TACs combine to exacerbate health risk, this needs to be addressed. R-15

Finally, the DEIR suggests that impacts involving hazardous materials are not cumulative. This is simply untrue, as in the area of asbestos emissions resulting from construction activities. R-16

D. The DEIR Relies on Improper Sources to Exclude Species from Consideration and Inexplicably Fails to Identify Protected Plant Species

The DEIR fails as an informational document with respect to biological resources because it relies on improper resource to conclude that species are not present on the subject site and also inexplicably defers all meaningful analysis of plant species. First, the DEIR expressly relies on three databases, including the California Natural Diversity Database ("CNDDB"), to conclude that species are not present in the subject area and therefore require no further analysis. (DEIR, p. 6-6). This is improper since these databases are not intended to be used as substantial evidence that species are not present. In fact, the CNDDB's license agreement includes a specific admonition to this effect:

> DFW does not portray its databases as an exhaustive or comprehensive inventory of all rare species and natural communities statewide. ***For any given location in California, a lack of species occurrences or records in no way indicates or implies that the species do not occur there***. Field observations by qualified persons and using the proper protocols at appropriate times are necessary to support negative findings. Much of the state has never been surveyed for plant and animal species.

(Exhibit 10, CNDDB License Agreement, ¶ 6 (emphasis added).)

Thus, a mere database search does not indicate that sensitive species are present. As the CNDBBA license agreement explains, "Field observations by qualified persons and using the proper protocols at appropriate times are necessary to support negative finding." Here, the DEIR fails to identify field observations, much less following "the proper protocols," that support negative findings. Thus, substantial evidence does not support the DEIR's conclusion that numerous special status species are not present on the subject site.

R-17

With respect to plant species, the DEIR acknowledges that no meaningful investigation was performed. (DEIR, p. 6-6.) The DEIR explains, "The site survey conducted by Dudek on March 4, 2016 was conducted at a time when special-status plants would not be evident and identifiable, so no special-status plant species were observed on the project site during the field survey." (*Ibid.*) The referenced plant survey occurred in March 2016, but the DEIR was not released until March 2019. The DEIR offers no explanation whatsoever why an appropriate survey for sensitive plant species could not have occurred during the three years between the initial plant survey and release of the DEIR. The City's failure to identify and disclose sensitive plant species

R-18

therefore represents a failure to proceed in a manner required by law, and the DEIR fails as an informational document. The same is also true regarding the DEIR's inexplicable deferral of a wetlands determination. Necessary investigation of impacts cannot simply be inexplicably deferred until after project approval. (*San Joaquin Raptor Rescue Ctr. v. County of Merced* (2007) 149 Cal.app.4th 645; *Banning Ranch Conservancy v. City of Newport Beach* (2017) 2 Cal.5th 918, 941.)

R-18 Cont.

Finally, the DEIR's analysis of cumulative biological impacts violates CEQA because it simply replicates the project-level analysis and fails to consider the impacts of the Project in conjunction with all related projects. This is insufficient under CEQA, which requires analysis of Project impacts "when added to other closely related past, present, and reasonably foreseeable probable future projects." (CEQA Guidelines, § 15355(b).) CEQA requires this cumulative analysis to assess adverse environmental change "as a whole greater than the sum of its parts." (*Environmental Protection Information Center v. Johnson* (1985) 170 Cal.App.3d 604, 625.) By failing to assess the Project's environmental impacts in conjunction with all other related projects, the DEIR did not proceed in the manner required by law.

Another example illustrates the point. When analyzing cumulative biological impacts, the DEIR asserts that potentially significant impacts would be mitigated to less than significant levels with implementation of the measures established in the project-level analysis. (DEIR, pp. 6-22 – 23.) This analysis and methodology, however, is contrary to CEQA, which does not allow an agency to avoid looking at an incremental contribution to a cumulative condition simply because a program- or project-level impact is less than significant. As the court noted in *Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98, 114 (*CBE*) (disapproved on other grounds by *Berkeley Hillside Preservation v. City of Berkeley* (2015) 60 Cal.4th 1086):

R-19

> One of the most important environmental lessons that has been learned is that environmental damage often occurs incrementally from a variety of small sources. These sources appear insignificant when considered individually, but assume threatening dimensions when considered collectively with other sources with which they interact.

The court explained that "the guiding criterion on the subject of cumulative impact is whether any additional effect caused by the proposed project should be considered significant given the existing cumulative effect." (*Id.*, p. 116.) CEQA requires consideration of the severity of existing environmental impacts since "the greater the existing environmental problems are, the lower the threshold should be for treating a

R-20

project's contribution to cumulative impacts as significant." (*Id.*, p. 120.) Accordingly, the DEIR's failure to consider existing and foreseeable cumulative effects when assessing the LRDP's incremental contribution violates CEQA's requirements.

By failing to analyze the combined effect of the Project and all other foreseeable related projects, the DEIR is fundamentally and basically inadequate and conclusory, such that meaningful public review and comment were precluded. The cumulative analysis for all sections must actually consider cumulative impacts, and the DEIR must be recirculated to provide the public an opportunity to comment on the substantially-revised analysis and any required mitigation. (CEQA Guidelines, § 15088.5, subd. (a)(1)-(4).)

R-20 Cont.

The DEIR also attempts to dismiss the need to address cumulative biological impacts because:

> The City of Grass Valley General Plan EIR found that while buildout of the General Plan would have the potential to result in significant impacts to biological resources, these impacts would be reduced to a less than significant level through compliance with the policies and standards identified in the General Plan. . . . Thus, there would be no significant cumulative impact to which the project could contribute.

(DEIR, p. 6-22.)

This argument is misplaced. This analysis is attempting to essentially "tier" from the City's General Plan EIR. However, the DEIR does not actually purport to tier from the General Plan EIR and follow CEQA's procedural mandates for doing so. The CEQA Guidelines provide, "When tiering is used, the later EIRs or negative declarations shall refer to the prior EIR and state where a copy of the prior EIR may be examined. The later EIR or negative declaration should state that the lead agency is using the tiering concept and that it is being tiered with the earlier EIR." (CEQA Guidelines, § 15152, subd. (g).) The DEIR never indicated that it was tiering from the General Plan EIR, nor complied with the required procedures to do so. Indeed, and importantly, the DEIR cannot tier from the City's General Plan EIR because the Project requires a General Plan Amendment, which means that the Project is not within the scope of the General Plan EIR. Finally, the DEIR does not explain how "compliance with the policies and standards identified in the General Plan" will result in a less-than-significant cumulative impact for all biological

R-21

resource considerations, much less how these unspecified "policies and standards" will be applied to the Project and made sufficiently enforceable.[2]

R-21 Cont.

E. The DEIR's Analysis of Public Services Is Internally Inconsistent and Relies on Long-Discredited Tactics to Minimize Project Impacts

As a threshold matter, the DEIR is internally inconsistent with respect to the Project's cumulative impact on sewer line capacity. On one hand, the Executive summary states:

> Based on the analysis of the future wastewater flows in the City's wastewater collection system (Appendix K), the project would contribute to the need to upsize one of the existing 18-inch twin sewer lines that pass under SR 20/49 to 24 inches or to add a third line. The need for increasing the capacity in this portion of the City's sewage infrastructure is identified in the City's Wastewater System Master Plan (City of Grass Valley 2016). As discussed further in Chapter 14, Public Services and Utilities, ***the proposed project would be required to contribute a fair-share amount to this future wastewater system capacity increase*** but would not be required to construct any off-site wastewater system improvements.

R-22

(DEIR, p. 2-10 (emphasis added).)

Chapter 14 of the DEIR, however, is inconsistent with this discussion. The DEIR's discussion of Impact 14-4 first acknowledges that the Project would in fact contribute to overcapacity of multiple sewer trunk lines under cumulative conditions, but ultimately finds the impact to less than significant without the need for any mitigation. (DEIR, p. 14-30-31.) DEIR Chapter 14 reaches this different conclusion by stating that the Project's contribution is somehow "minimal."

It is not clear what is meant by "minimal" since the DEIR also states, "The percentage of new flow that the proposed project would contribute at each location ranges from 11.2% to 15.5%"—which appears significant. Further, the City's attempt to minimize the Project's cumulative impact by comparing it to the scope of the overall problem is precisely the same "ratio theory" or "drop in the bucket" argument disapproved long ago in *Kings County Farm Bureau v. City of Hanford* (1990) 221

[2] The DEIR gives one "example" concerning "loss of habitat," but it is unclear whether this is intended to be exhaustive. One would think not since the actual take of protected species is another CEQA consideration that is separate from habitat loss.

Cal.App.3d 692; *CBE*, *supra*, 103 Cal.App.4th 98.) "In the end, the greater the existing environmental problems are, the lower the threshold should be for treating a project's contribution to cumulative impacts as significant." (*CBE*, *supra*, 103 Cal.App.4th at 120.) Thus, the revised and recirculated EIR will need to clarify that the impact is significant and requires mitigation.

R-22 Cont.

The revised and recirculated DEIR will also need to propose a lawful mitigation strategy for the Project's cumulative impact. Rather than require mitigation from the Project, the EIR instead proposes the City address the cumulative impact itself: "The City's Wastewater Master Plan outlines an improvement plan with alternatives that address the deficiencies of the existing wastewater collection and treatment facilities." (DEIR, p. 14-31.) Having acknowledged the impact as significant, the lead agency has a duty to set forth all feasible mitigation measures. This could include requiring the Project to construct its own sewage containment system, requiring the Project to be solely responsible for system-wide upgrades and seek subsequent reimbursement from later development, or some other solution. Alternatively, mitigation could include an impact fee or assessment on the project to provide a fair-share contribution to the cost of this improvement, so long as the fee program satisfied the *Anderson First* decision. If the City finds that no mitigation is feasible, then it must identify the impact as significant and unavoidable.

R-23

Alternatively, if the City believes that the proposed improvement plan will address the impact, then the City must commit to implementing that plan in the Project's Mitigation Monitoring and Reporting Program since all mitigation must be enforceable. (Pub. Resources Code, § 21081.6, subd. (b).) If the City chooses to mitigate the Project's impact <u>without asking the developer to contribute its fair share to the necessary improvement</u>, then the City must disclose material information about that public subsidy pursuant to Government Code section 53083. This subsidy may also constitute an unlawful gift of public funds. (Code Civ. Procedure, § 526a.)

R-24

F. Noise

1. <u>Freeway noise impact on future Project residents</u>

The DEIR correctly notes that the Project will exacerbate traffic on State Route 20/49, and so roadway noise impacts on future Project occupants is a relevant and necessary consideration under CEQA pursuant to the *California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal.4th 369 decision. However, the DEIR misrepresents the amount of traffic on State Route 20/49, thereby minimizing noise impacts. Table 9-5 states that the existing average daily traffic

R-25

volume for State Route 20/49 in 2016 was 29,350. This is false. According to Caltrans, the annual average daily trips on State Route 20/40 immediately before Dorsey Drive is, i.e. the precise location of the Project, is 41,000. (Exhibit 11, excerpt from Caltrans 2016 Traffic Volumes on California State Highways.) Thus, the DEIR understates vehicle traffic on State Route 20/49 by 11,650 trips or 40 percent.[3] The DEIR also understates year 2035 traffic volumes by assuming exactly the same volume. Finally, the DEIR provides no explanation supporting its implied assumption that there will be literally no increases in traffic volumes over 30 years. These issues will need to be addressed in a revised and recirculated DEIR.

R-25 Cont.

Setting aside the DEIR's failure to properly characterize roadway noise, the DEIR also fails to demonstrate that it identified proper receiver locations. DEIR explains the modeled receiver locations as follows:

> As shown in Figure 9-2, Noise Modeling Locations, receiver locations M1, M2, M3, M7 and M8 represent future residential locations within the project site. M1 is located at the southwest corner of the residential part of the project, east of the proposed extension of Spring Hill Drive along the southern portion of the project site. M2 is located at the northern portion of the residential development area near the existing multifamily development to the east. M3 is placed near the center of the residential area in the southeastern portion of the project site. M7 is located on the east side of Spring Hill Drive. M8 represents residential receivers closer to SRR 20/49, in the area of the office and residential development area under Alternative B.

(DEIR, p. 9-14 – 15.)

Tellingly, these locations are never described as the nearest residential units to the roadway. Rather, the EIR describes them as "the representative residential receiver locations." (DEIR, p. 9-15.) Unless the "representative" locations include the nearest receptor locations, the noise impacts may be understating noise impacts.

R-26

[3] To the extent these incorrect roadway volumes are utilized in the DEIR's traffic and air quality (specifically TAC emissions) analyses, these sections will also need to be significantly revised and recirculated.

2. Construction noise on existing residents who live adjacent to the Project site

The DEIR provides misleading information regarding construction noise impacts in at least two ways. First, the DEIR acknowledges that "[t]he nearest receiver is about 30 feet from the construction operations," (DEIR, p. 9-22) and yet the DEIR provides irrelevant and misleading information in Table 9-13 about noise levels for various construction activities at 50 feet away. Since the nearest receptor is 30 feet away, the information in Table 9-13 is irrelevant to assessing Project noise impacts—and can only be interpreted as attempting to minimize such impacts. R-27

Second, the DEIR minimizes noise impacts by analyzing "average" noise rather than the most severe actual noise levels:

> [A]verage construction noise levels could range from approximately 68 dBA to 82 dBA Leq. These levels are up to 27 dB above the daytime ambient noise level restriction for fixed source noise levels within noise-sensitive land use zones under the Grass Valley Noise Ordinance. R-28

The asserted significance standard does not rely on "average" noise levels, and indeed such analysis is misleading and dismisses the impacts to the nearest sensitive receptors being exposed to more than 90 decibels of noise, which the DEIR acknowledges results in human health impacts.

Further, the DEIR both impermissibly defers mitigation and fails to disclose the effectiveness of proposed mitigation. As to improper deferral, the DEIR merely states that "all stationary noise-generating construction equipment, such as air compressors" are "located as far as practical from nearby homes," but that "grading and improvement plans shall include provisions to provide acoustical shielding" "where such equipment must be located near adjacent residences." The DEIR fails to describe what is meant by "as far as practical from nearby homes," much less what 'acoustical shielding" means. Moreover, and most importantly, the DEIR fails to provide any information demonstrating that these mitigation measures will reduce noise impacts at the nearest sensitive receptors to 55 dBA as required by the City's Noise Ordinance. R-29

To the extent the City intends to not revise its analysis as required by CEQA and instead assert in the FEIR that there is no significance standard applicable to noise resulting from construction activities pursuant to City Code section 8.28.100, this strategy would violate CEQA. (*Amador Waterways*, *supra*, 116 Cal.App.4th at p. 1109 ("a threshold of significance cannot be applied in a way that would foreclose the R-30

consideration of other substantial evidence tending to show the environmental effect to which the threshold relates might be significant").)

R-31

* * *

Thank you for considering these comments. As demonstrated above, the DEIR is woefully inadequate in many areas and requires significant revision and recirculation in order to comply with CEQA's informational disclosure mandates. Please feel free to contact my office with any questions.

R-32

Very truly yours,

SOLURI MESERVE
A Law Corporation

By: 
Patrick M. Soluri

PS/mre

Attachments:

Exhibit 1	Cahill, Chapters 7 and 8
Exhibit 2	Cahill, Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 1: 2003–2007
Exhibit 3	Cahill, Artificial ultra-fine aerosol tracers for highway transect studies
Exhibit 4	Cahill, Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 2: 1974–1991
Exhibit 5	Volk, Residential Proximity to Freeways and Autism in the CHARGE Study
Exhibit 6	Cahill, Transition metals in coarse, fine, very fine and ultra-fine particles from an interstate highway transect near Detroit
Exhibit 7	Dudek Memo
Exhibit 8	SMAQMD CEQA Guidelines
Exhibit 9	BAAQMD CEQA Guidelines
Exhibit 10	CNDDB License Agreement
Exhibit 11	Excerpt from Caltrans 2016 Traffic Volumes on California State Highways

EXHIBIT 1

Chapter 7

"Black, Black, Black Is the Color of My True Love's ..." Exhaust

Diesel exhaust

Major impacts: Lung cancer, heart and lung disease, mental impacts, asthma and more

Introduction

California's Proposition 65 (the Safe Drinking Water and Toxic Enforcement Act of 1986) mandates an inventory listing toxic materials and public warnings of their presence. The list is long, but one substance alone, diesel exhaust, accounts for 70 percent of the airborne toxic effects of all toxic air contaminants (TAC) combined. The primary problem is heavy polycyclic aeronautic hydrocarbons (PAHs) caused by incomplete combustion of heavy petroleum fuels. But diesel exhaust warrants many other concerns, too. In a recent study, prenatal exposure to PAHs was correlated with physical changes in children's brain structure along with mental problems, slower reasoning, hyperactivity, and more.

The reason why diesel exhaust is so polluting and toxic is inherent in diesel combustion. The walls of the engine's cylinders must be kept relatively cool, but the combustion in the center is very hot. This allows partial combustion of the heavy fuel and the generation of polycyclic aromatic hydrocarbons (PAHs), the most problematic carcinogenic compounds in the atmosphere. And while diesel exhaust is ubiquitous, There are areas of special concern in certain locales. Many of these are downwind of rail yard and truck multimodal facilities. For example, the plume of materials from the BNSF Railway facility in San Bernardino, California, was estimated at about 2,500 excess cancer deaths per lifetime. Note that since the lifetime risk of cancer is on the order of one quarter of all deaths (250,000 afflicted among each million in population), the excess amounts to only about a 1 percent increase even in this especially impacted area with just a few thousand people.

One key reason for this relatively low risk today is the 91 percent reduction in diesel emissions from trucks during the past 30 years, from 1,100 milligrams of emissions per kilometer traveled (mg/km) in 1972, to about 100 mg/km in 2002, as Figure 7-1 shows. Further progress is occurring, resulting in development and production of very clean-burning diesel engines. This is well advanced in long-haul trucks, but almost totally lacking in three-axle diesel vehicles (including school buses, dump trucks and delivery vans) and, regretfully, most trains. Cars pose special problems in trying to maintain diesel soot reduction techniques, assuming they are not part of some scam (viz. Volkswagen)

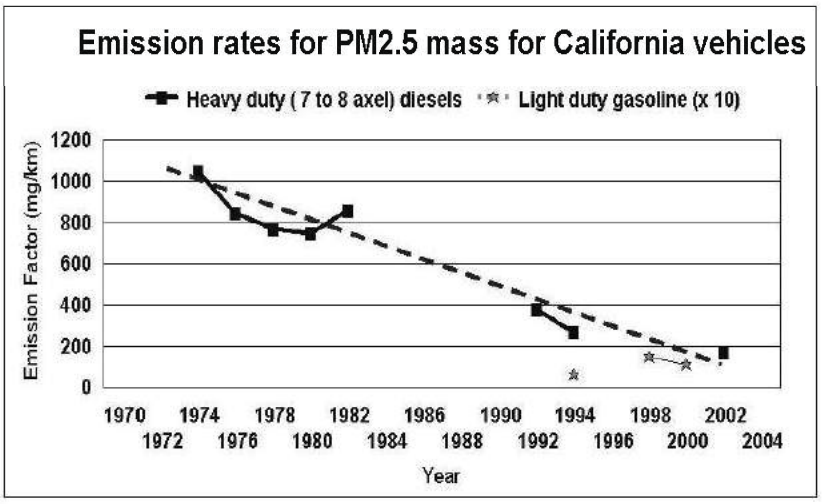


Figure 7-1. $PM_{2.5}$ emission factors for heavy- and light-duty trucks, 1972–2002. Cars produced about one-tenth the emission volume that trucks do.

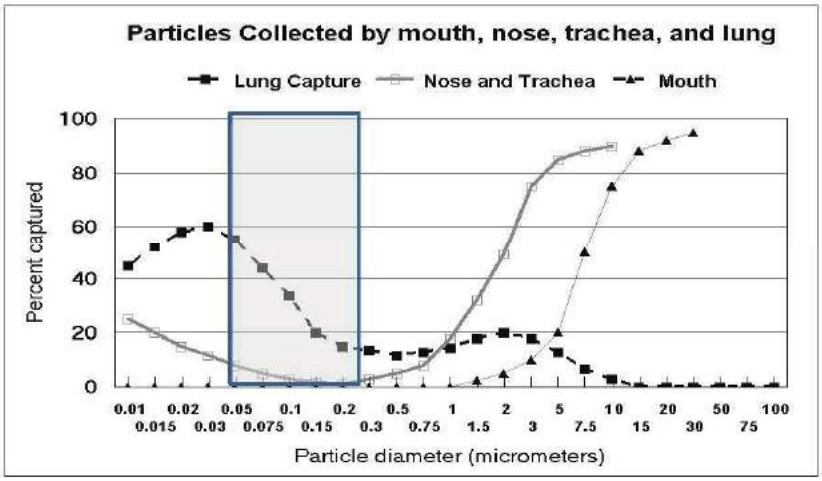


Figure 7-2. The gray shaded area shows the size range and lung deposition for diesel exhaust.

And on top of this, there is Volkswagen. I was amazed in 2009 that it ever made the ARB's smog emission limits. Well, a "defeat device" that sensed when the car was being tested turned on emission controls. Once testing was done, the device turned off the pollution control system, after which time the car emitted 10 to 40 times more nitrous oxide than allowed.

Even greater problems appear in Europe, where about half of all cars have diesel engines. That may be why Paris and other European cities still have such dirty air, despite claims of widespread use of "clean diesel." In addition, the manufacturers' mileage claims are inflated by about 40 percent, using tricks while they do their own tests.

How can I protect myself?

Essentially all diesel exhaust comes from one of seven sources:

1. Heavy duty (typically eight-axle) diesel-powered trucks on freeways and major highways
2. Lighter duty (often three-axle) diesels on secondary streets, such as delivery and dump trucks, school buses, and the like

3. Railroad diesel engines, especially downwind of a rail yard

4. Off-road and construction diesel-powered equipment

5. Diesel-fueled water pumps for agriculture

6. Peaking diesel-powered electric backup generators used to respond to short term power needs

7. Diesel-powered cars

Do your homework. Explore the websites of transportation agencies and other reliable sources for data on heavy truck use.

For each of the diesel sources given above, different types of protection are needed:

- For sources1 and 2 (diesel on vehicular roadways), follow the "How can I protect myself" guidelines in Chapter 8 for ultra-fine particles and in Chapter 9 for highways.
- For diesel source 3, become aware of railroad activities, and especially rail yards, because some of the worst levels of toxic air contaminants occur downwind of rail-truck facilities. Check the Chapter 7 (Diesel exhaust) section about the Roseville, California, rail yard. That segment shows that diesel exhaust in rail yards is more toxic than that emitted by trucks on roadways.
- For diesel sources 4 and 5, don't sweat it, as they are not close to you for extended periods.
- For source 6, learn where such generators are in relation to wind direction, and ascertain how often they run. Usually such facilities, if in cities, have particle controls on them.
- For source 7, read on to learn more about Volkswagen cheating.

More about Volkswagen's diesel cheating

Cheating on "clean diesels"? I am shocked! Shocked! But I was really shocked when told in 2009 that the Volkswagen diesel had passed the ARB's stringent dynamometer emission tests. Make no bones about it – diesel combustion is essentially filthy, and only by extensive and expensive efforts can its problems be overcome. I had no clue that a corporate fix was on.

There had been several earlier examples of shenanigans with "defeat devices" by homegrown and foreign auto companies, but this one from Volkswagen was a lulu, with pollution up to 40 times greater than the maximum allowable standard. The heart of the matter is that California's vaunted vehicle testing and validation programs have an "Achilles heel": what is seen in laboratory dynamometer tests is not what appears on the highway. Volkswagen knew that, and if not for a fluke West Virginia based on-road test that revealed the discrepancy, could have continued cheating for years to come.

This is not the first time lab results and real-world results differed. I was working on lead pollution from highways in 1973. We had models from the U.S. EPA, but California wanted to validate these by on-road testing. My work found that the elevated freeways that were supposed to be the cleanest by the EPA model were the dirtiest, dumping 400 percent more lead than the California standard into downwind houses. My data helped Jerry Brown version 1.0 (in his first term as California's governor) win a sweeping victory against both industry and the EPA, which opposed establishment of separate California standards. The stunning reductions in California air pollution encouraged most of the world to follow California, with the exception of Europe and its diesel fixation based on mileage claims. But automotive manufacturing companies hire the contractors to do the testing. What could possibly go wrong in this scenario? It probably explains why on-road mileage of diesels in Europe is about 40 percent worse than advertised.

By the mid 1980's, it had become clear that something was wrong in the Los Angeles basin. Ozone precursor gasses and ozone itself were not decreasing in the way the laboratory measurements and air quality models predicted. The answer came from a series of tests made in a freeway tunnel in Van Nuys, in the San Fernando Valley region of Los Angeles. Tunnels are nice to use because the volume of air and the number and types of cars and trucks were both accurately known. Thud the tunnel studies were able to compare the predicted auto emissions from ARB dynamometer laboratory tests to real-world conditions. The tunnel tests revealed carbon monoxide (CO) and hydrocarbon (HC) emission values 300 percent and 400 percent higher, respectively, than expected on the basis of dynamometer tests. The on-road tests identified a sad result – most California cars were clean, but a small number of "gross emitters" were discharging two-thirds of all highway pollution. These cars include modified vehicles with

bypassed catalytic converters, old throw-away cars, unregistered cars, cars with fake smog check clearances, and the like.

In order to rectify the problem of "gross emitters," the California Inspection and Maintenance Review Committee (IMRC), a state board on which I served for years, repeatedly recommended on-road testing to identify "gross emitters." The technique is actually simple, using an infrared beam aimed across a freeway on-ramp to measure pollutants. If this test had been modified to also detect nitric oxide (NO), that would have immediately identified the diesel cheaters, and the pollution would have been stopped years ago. Regretfully, the IMRC was shut down in 2011.

And even post-Volkswagen, laboratory dynamometer tests cannot protect us in real-world conditions. "Wear" aerosols – from the roadbed, resuspended freeway dust, brake drums, and other sources resulting from abrasion, cannot be realistically measured in the lab. But health data on children living near freeways in Los Angeles, and our data on heart disease in the Central Valley, show that roadways are still causing health problems. Medical studies points to "wear" aerosols and ultra-fine metals from brakes as potentially toxic agents. This very important problem of very fine and ultra-fine metals from brakes will be covered in the next chapter.

California needs to initiate truly realistic on-road testing not only to catch "gross emitters" and to detect cheating by "defeat devices," but also to measure "wear aerosols" by size and composition. These tests should include realistic freeway actions such as braking and accelerating, as I and my team are doing in an ongoing U.S. EPA study in Detroit. Only with such data can we propose legislation that can rectify these problems and protect the health of Californians.

The special case of diesel trains and rail yards

The Union Pacific rail yard in Roseville, 15 miles northeast of Sacramento, California, is one of the largest in the western United States, and has a major repair and testing missions. As normal operating procedure, diesel engines are often left idling for extended periods of time. California Air Resources Board analysis in 2004 indicated about 900 excess cancer deaths per lifetime downwind of the rail yard. Note that the BNSF intermodal rail yard in San Bernardino had a predicted cancer death rate of about 2,500 per lifetime, much worse than Roseville.

We participated in tests of rail yard impacts both for diesel and other pollutants emitted from the repair activities. One of the goals was to make a direct measurement of diesel components, and especially the heavy PAHs like benzo[a]pyrene, a potent carcinogen in diesel smoke, for comparison with the ARB model. We also wished to evaluate other potential particulate pollutants emitted by comparing downwind sites to upwind or control sites. Figure 7-3 illustrates a comparison between a downwind site (Denio's Roseville Auction) and an upwind site for sulfur, associated with the sulfur in diesel fuel. Many other metallic aerosols followed the same pattern.

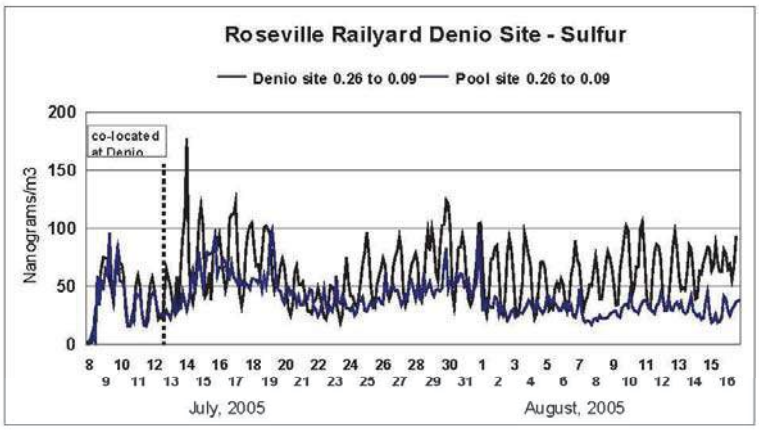


Figure 7-3. Comparison of very fine sulfur, Denio site vs. an upwind site.

For the comparison of cancer death rates, we measured speciated organics as a function of particle size. Figure 7-4 is one such plot, showing that these PAHs deposit deep in the lung.

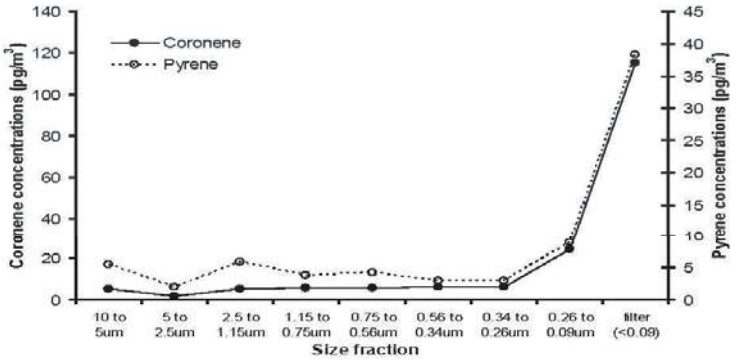


Figure 7-4. Roseville rail yard coronene and pyrene concentrations (pg/m^3) delineating the different size fractions of the eight-stage DRUM sampler (Davis Rotating-drum Universal size-cut Monitoring impactor) and the after-filter.

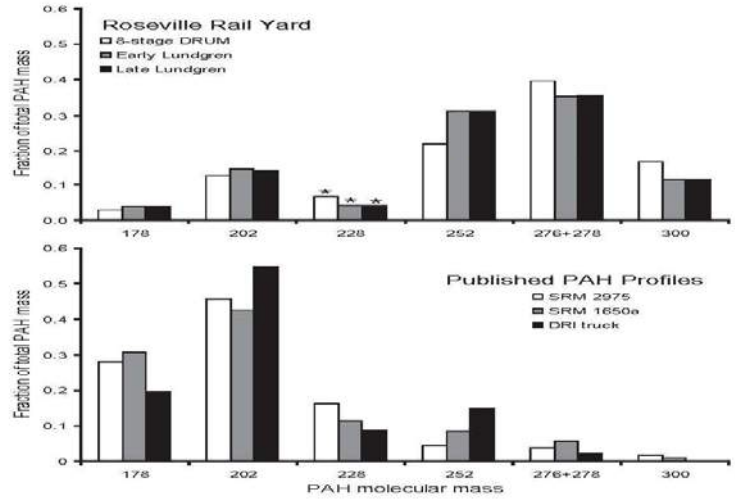


Figure 7-5. Comparison of Roseville rail yard and truck diesel PAH profiles.

Rail yards have a variety of diesel sources – some of which are unique to them, such as idling diesels and stationary diesels under test, as in the Roseville rail yard. As an additional complication, the BNSF rail yard in San Bernardino is an intermodal facility that is subject to heavy truck traffic from the Port of Los Angeles and Long Beach. Both diesel testing and port-to-rail transit traffic are likely to generate enhanced cancer rates downwind.

References

- Cahill, Thomas A., Thomas M. Cahill, David E. Barnes, Nicholas J. Spada, and Roger Miller. 2011. "Inorganic and Organic Aerosols Downwind of California's Roseville Railyard." *Aerosol Science and Technology* 45: 1049–1059. doi:10.1080/02786826.2011.580796.
- Cahill, Thomas A. (P.I), Thomas M. Cahill, David E. Barnes, Nicholas J. Spada, Steven S. Cliff, Kevin D. Perry, and Erin Fujii. November 1, 2007. "Final Report to the Health Effects Task Force (HETF), Breathe California of Sacramento-Emigrant Trails: Mass, Organic, And Elemental Aerosols by Size, Time, and Composition at the Union Pacific Rail Road's Roseville Railyard."
- Gertler, Alan, Mahmoud Abu-Allaban, William Coulombe, John A. Gillies, William R. Pierson, C. Fred Rogers, John C. Sagebiel, Leland Tarnay, and Thomas A. Cahill. 2002. "Measurements of Mobile Source Particulate Emissions in a Highway Tunnel." *International Journal of Vehicle Design 2001,* 27:86–93. doi:10.1504/IJVD.2001.001954.
- Zielinska, B. et al. 2004. "Final Report of the Diesel Studies." Desert Research Institute.

Chapter 8

"It Was an Itsy Bitsy Teenie Weenie Yellow ..." Ultra-fine Metal

Copper and other ultra-fine transition metals

Major impacts: Cardiopulmonary conditions, especially ischemic heart disease and permanent loss of lung function in children

[*For the antiquity-challenged, the 1960 song that inspired the title of this chapter was about a young girl suffering a mild case of hypothermia due to a questionable swimwear choice.]*

Introduction

I probably take more pride than I should or deserve for highlights in my career – the first, the only, the biggest. But I am embarrassed about one record. I am told that I hold the record at the Trauma Intensive Care Unit of the University of California, Davis, Medical Center for the most ribs broken in a single fall from a ladder – seven – by a patient who survived. Knowing that now, I really should not have been climbing a long ladder onto the roof of Arden Middle School in the rain with my colleague, Betty Turner (combined ages circa 140 years) on that December day in 2002.

We were responding to a request by the principal to add Arden Middle School to a network of air sampling stations we were setting up. The network was designed to evaluate the effects of freeways on Sacramento, as part of our research with the Health Effects Task Force of what is now Breathe California of Sacramento-Emigrant Trails (at that time an affiliate of the American Lung Association). The study focused on the health-compromising implications of aerosols from two heavily traveled north-south freeways, Interstate 5 and California Highway 99. The six-site network stretched 50 miles, from the western side of the Sacramento Valley west of Davis to the foothills of the Sierra Nevada east of Sacramento. The request from the principal of Arden Middle School was based on her concerns about the school's proximity to the intersection of two main arterials. The school grounds are 50 feet downwind of the signal-controlled

intersection of multi-lane Watt Avenue at Arden Way, and those streets were and are heavily used and often congested. Arterial streets were never part of our plan to evaluate air quality adjacent to freeways, but I had one extra air sampler, just brought back from the Aerosol Characterization Experiment-Asia (ACE-Asia) study (see Chapter 10, The Mad Hatter Had a Point) and, lacking any available staff at that moment, the geezer squad swung into action.

Once again, I am struck about how lucky I have been in my career. I was not at all interested in Arden Middle School because it was not part of our plan, but it turned out to be the key to unlocking one of the major detrimental health effects affecting the nation. When we finally completed our analysis of the results in spring 2003, we discovered that Arden Middle School – downwind of 65,000 vehicles per day, 1.5 percent of which are heavy trucks traveling on Watt Avenue – was subject to about the same amount of pollution as locations measured downwind of Interstate 5 carrying 265,000 vehicles per day, 12 percent of which are heavy trucks.

These results were a wake-up call that we had better look more closely at Arden Middle School, triggering intensive studies in 2006 and 2007. Table 8-1 illustrates the results of these and other comparative studies.

Sampling site	Sampling dates	Mass data, very fine particles	Mass theory, very fine plus ultra-fine	Comment
Size modes		0.26 to 0.09 µm	0.30 to 0.0 µm	
Sacramento, Interstate 5	Winter 2002	4.1 µg/m^3		265,000 vehicles/day
Fresno, 1st Street	Winter 2001	4.2 µg/m^3		
Arden Middle School, Watt Avenue	Winter 2006	4.0 µg/m^3	6.4 ± 0.8 µg/m^3	65,000 vehicles/day

Table 8-1. Measurements at Arden Middle School, in suburban Sacramento, and comparative data and theory. The theory value is based on three sources, averaged.

These results could be explained only by the anomalous fact that for the first time in decades we were measuring aerosols at a study at a stop light, with braking and acceleration. We all noticed the plumes of black smoke when the diesels accelerated as the light turned green.

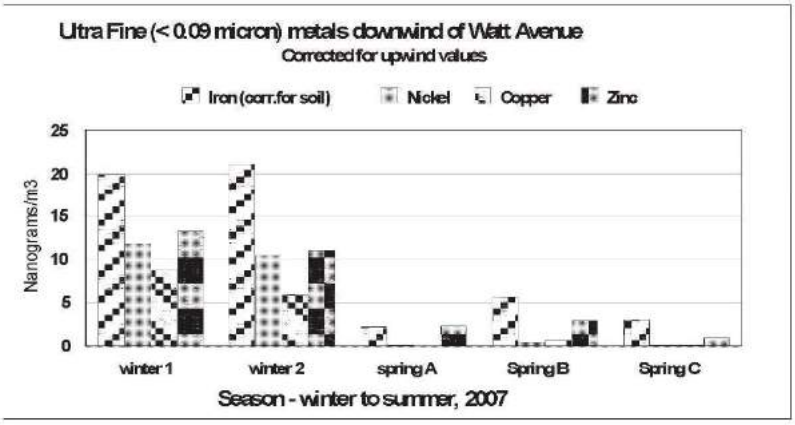
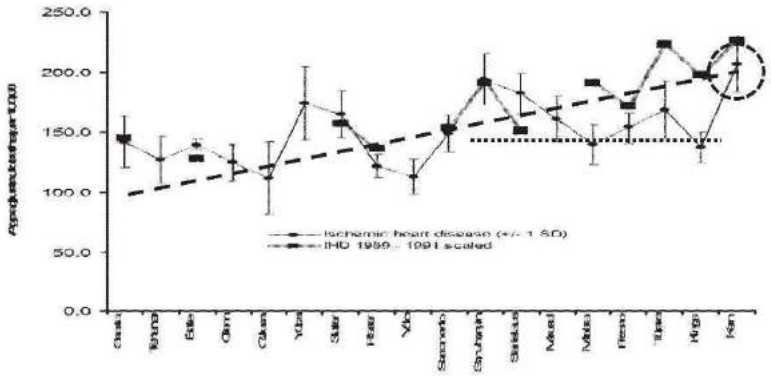


Figure 8-1. Ultra fine metals at Arden Middle School 50 feet downwind of Watt Avenue

Three other long-term research efforts now came to bear. The Health Effects Task Force (HETF) already had spent several years looking at the enhanced heart attack death rate in the southern San Joaquin Valley, which we showed was associated with enhanced ischemic heart disease (HETF, 1997). A separate key study in Los Angeles showed large losses of lung capacity in children growing up near freeways. And UC Davis environmental health teams identified a relationship between freeway proximity and incidence of autism, with metals a likely cause.



1634

1635 Figure 8-2. Death rates from heart attacks by location in the California Central Valley.
1636 The lower dotted line traces the reduced rate of ischemic heart disease that resulted
1637 from a 1990 cleanup of ultra-fine metals from oil extraction operations. Note that the
1638 cleanup did not reduce heart attack incidence in Bakersfield (dotted circle), which is
1639 upwind of most of the oil fields.

1640 A search of the scientific literature confirmed what we already suspected: these metals are
1641 known constituents of brake pads and drums, plus some zinc from zinc thiophosphate, a
1642 stabilizing additive in motor oil that we had seen before in ultra-fine modes (Zielinska et al.,
1643 2004).

1644 All these data led to the hypothesis that the enhanced heart attacks in the southern San
1645 Joaquin Valley might be caused by ultra-fine particles of brake drums and pads from cars and
1646 trucks trapped at cities that experience intense winter inversions, as Bakersfield does. With
1647 assistance from a local non-governmental organization, we did a study in January 2009
1648 simultaneously measuring coarse, fine, very fine and ultra-fine particles at five sites from
1649 Redding (at the northern end of California's Central Valley) to Bakersfield (440 miles distant, at
1650 the southern end of the valley). This study also benefitted from much better data on deaths rates,
1651 including data that showed one specific source of mortality was ischemic health disease (IHD),

the largest single cause of death in the San Joaquin Valley. It also used data from extensive EPA studies on metals in rats, and our data from Watt Avenue tying these metals to braking. Thus, in summary, the resulted in peer reviewed papers in a special US EPA journal proving that very fine and ultra-fine insoluble metallic particles were the cause of thousands of fatal heart attacks.

When added to the earlier work on loss of lung function in children growing up near (less than 1 mile) Los Angeles freeways and the data on enhanced autism rates for pregnancies near freeways, the seriousness of the very fine and ultra-fine metals becomes urgent.

And now we know what you can do protect yourselves.

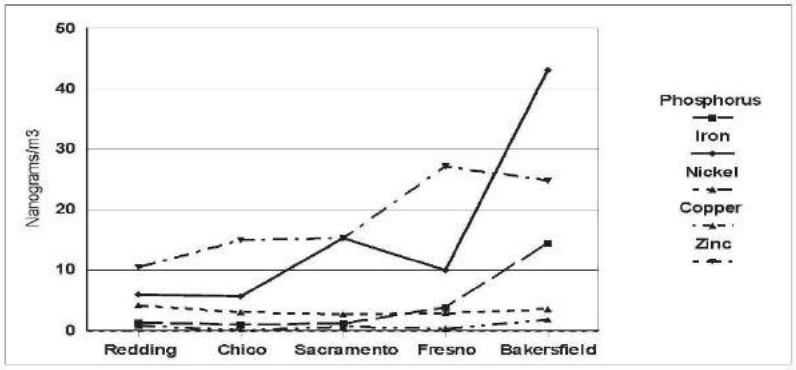


Figure 8-3. Very fine and ultra-fine metals that correlate with ischemic heart disease (IHD) mortality. IHD is usually the largest single reason for heart attack mortality in the California Central Valley.

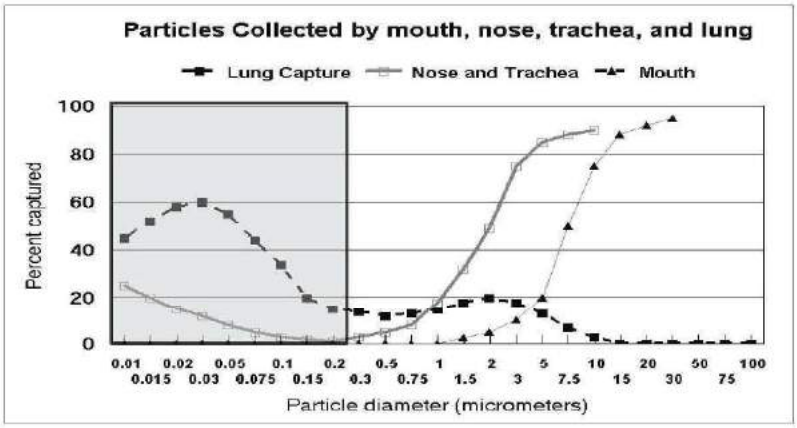


Figure 8-4. The gray shaded area shows the size range and lung deposition for very fine particles with diameters between 0.25 micrometers and 0.1 micrometers, and ultra-fine particles with diameters less than 0.1 micrometers. These are normally written in a short version, for very fine ($0.25 > Dp > 0.1$ µm) and for ultra-fine particles, ($D_p < 0.1$ µm).

How can I protect myself?

Know the sources:

- Avoid the outdoor areas where such particles exist, especially downwind of roadways where heavy braking routinely occurs (Chapter 9, Outdoor Air Quality)
- Learn of other industrial sources of ultra-fine metals, especially car shredding operations, and ultra-filter the air in your house (Chapter 10, Indoor Air Quality)

Nitty-gritty details

Comparison of diesel exhaust to ischemic heart disease death rates

The California Proposition 65 (law on toxics) limit for notification: 10 deaths per million people per 70-year lifetime, or approximately a **0.001% increase in the total death rate**

Diesel exhaust is the most ominous of the old Prop 65 toxic air contaminants (TACs), resulting in about 70 percent of all cancer cases attributable to TACs combined. Using the fact that about 20 percent of all deaths are from either cancer or heart attacks, we can estimate the enhanced death rate, deaths per million people per 70-year lifetime:

- Downwind of Union Pacific rail repair yard, Roseville, California: approximately 800 deaths per million people per 70-year lifetime: **about a 0.5 percent increase in the cancer death rate**
- **VW diesel cheating** (if continued at the present level – estimate by the *Sacramento Bee*): approximately 900 deaths per million people per 70-year lifetime: **about a 0.5 percent increase in the cancer death rate**
- Downwind of the worst California rail-truck facility, in San Bernardino approximately 2,500 deaths per million people per 70-year lifetime: (ARB report, San Bernardino BNSF): about a **1.3 percent increase in the cancer death rate.** This rate equates to < (fewer than) 1,000 people in the city of San Bernardino

Now compare that to the impact of very fine and ultra-fine metals from brakes:

- Bakersfield, in the city center: **approximately 25 percent increase in the heart attack deaths (**this rate affects about 350,000 people in the city of Bakersfield)

Thus the death rate in Bakersfield, enhanced by approximately 25% in the death rate of the single largest source of mortality in a city of 350,000 people, can be compared to the enhanced death rate at the worst California site impacted by diesel, about 1.3% in a population of no more than a few thousand people. So while vast efforts are being made to control diesel, and with considerable success, very fine and ultra-fine metals, proven killers, slide by under the radar. As I said in Chapter 4, "…the Worst of Acts".

Note added in proof:

We have just published a paper on Detroit that includes the final statement of the abstract: "……*This result supports earlier publications showing the ability of very fine and ultra-fine particles to transport to sites well removed from the freeway sources. The concentrations of very fine and ultra-fine metals from brake wear and zinc in motor oil observed*

in Detroit have the potential of being a significant component in statistically established $PM_{2.5}$ mortality rates."

Transition metals in coarse, fine, very fine and ultra-fine particles from an interstate highway transect near Detroit, Thomas A. Cahill, David E. Barnes, Jonathan A Lawton, Roger Miller, Nicholas Spada, Robert D. Willis and Sue Kimbrough (the last 2 EPA OAPQS North Caroline), Atmospheric Environment (9/2016)

Detroit is a lot bigger than Bakersfield. The word is getting out.

References

- Cahill, Thomas A., David E. Barnes, Nicholas J. Spada. 2014. **"Seasonal Variability of Ultra-Fine Metals Downwind of a Heavily Traveled Secondary Road."** *Atmospheric Environment* 94: 173–179.
- Cahill, Thomas A. David E. Barnes, Nicholas J. Spada, Jonathan A. Lawton and Thomas M. Cahill, 2011. **"Very Fine and Ultra-fine Metals and Ischemic Heart Disease in the California Central Valley 1: 2003–2007."** *Aerosol Science and Technology* 45: 1125–1134. doi:10.1080/02786826.2011.582194
- Cahill, Thomas A., David E. Barnes, Earl Withycombe, and Mitchell Watnik. 2011. **"Very Fine and Ultra-fine Metals and Ischemic Heart Disease in the California Central Valley 2: 1974–1991."** *Aerosol Science and Technology* 45:1135–1142. doi:10.1080/02786826.2011.582196.
- Cahill, Thomas A., Thomas M. Cahill, David E. Barnes, Nicholas J. Spada and Roger Miller. 2011. **"Inorganic and Organic Aerosols Downwind of California's Roseville Railyard."** *Aerosol Science and Technology* 45: 1049–1059. doi:10.1080/02786826.2011.580796.
- •Cahill, Thomas A., Debrina Dutcher, Chris Clark, Jeanette Martin, Theresa McCarthy, and David Lipnick. June 1998. **"Comparison of Cardiac and Stroke Mortality to Carbon Monoxide, Ozone, and Particulate Air Pollutant Concentrations in the Sacramento region: Final Report to the American Lung Association of Sacramento – Emigrant Trails."**

- Cahill, Thomas M. 2010. **"Size-resolved Organic Speciation of Wintertime Aerosols in California's Central Valley**." *Environmental Science and Technology* 44: 2315–2321. doi: 10.1021/es902936v.
- Cahill, Thomas M., and Thomas A. Cahill. 2013. "**Seasonal Variability of Particle-associated Organic Compounds Near a Heavily Traveled Secondary Road**." *Aerosol Science and Technology*. doi: 10.1080/02786826.2013.857757

Thomas A. Cahill, David E. Barnes, Jonathan A Lawton, Roger Miller, Nicholas Spada, Robert D. Willis and Sue Kimbrough, **Transition metals in coarse, fine, very fine and ultra-fine particles from an interstate highway transect near Detroit,** in press, Atmospheric Environment (2016)

Gauderman, W. J., McConnell, R., Gilliland, F., London, S., Thomas, D., Avol, E., Vora, H., Berhane, K., Rappaport, E. B., Lurmann, F., Margolis, H. G. and Peters, J. (2000). **Association between air pollution and lung function growth in southern California children.** *Am. J. Respir. Crit. Care Med.* 162:1383-1390.

Volk, H. E., Hertz-Picciotto, I., Delwiche, L., Lurmann, F., and McConnell, R., Residential **Proximity to Freeways and the CHARGE Study**, Environmental Health Perspectives, **119,** # 6 , pg 872 – 877 (2011)

Shut down Tom – attempt No. 3

Ultra-fine particles and the massive governmental screw-up at the World Trade Center

- **George Bush, president, 2003 – World Trade Center air was not safe to breathe!**

None of us can forget when we first became aware of the WTC disaster on September 11, 2001. But my concerns were raised higher when three days later, I saw TV coverage showing blue fumes coming up from the collapsed piles after a rainstorm on September 13. Blue smoke is bad smoke, especially in industrial fires, because it indicates very fine particles that go deep into the lung and even the bloodstream and heart. I felt both helpless and worried for the workers and firemen working in such conditions.

About two weeks later, I received a phone call from Bob Leifer, Department of Energy physicist with a laboratory on Varick Street in New York. His laboratory was at the southern limit of sites that still had electrical power. We had collaborated on the Mount St. Helens work, and I respected his expertise. He asked if I could send one of my Davis Rotating-drum Universal size-cut Monitoring impactor(DRUM) samplers to him. I had invented the current DRUM sampler in 1985, and it has been the work horse of my research for decades. It was designed to address problems with EPA required sampling protocol, which required 24 hr average filters analyzed only for mass. The standard protocol also calls for operating this unit only one day in 6. (see Chapter 4) The DRUM gives data in 8 size modes, not one size mode, every 3 hr, not every 24 hr, and is routinely analyzed for mass, 42 elements, soot, and occasionally organic matter.

Well, one had just come back from Beijing and ACE-Asia, (Chapter 19), so a cleaned it up, reloaded foils, and just made the FedEx pickup at 4 p.m. that Friday.

Robert got the sampler up and running by October 2, and ran it flawlessly until we shut down in mid-December. At that time, we analyzed the samples at the Advanced Light Source, Lawrence Berkeley National Laboratory, and at Lawrence Livermore National Lab. By Christmas we had the results, which showed that, despite what the EPA and White House press releases asserted, the air was most assuredly not "safe to breathe," and that people could expect massive detrimental health effects. These health problems included both the "WTC cough" (from coarse particles) and loss of lung function and eventual ischemic heart disease (from ultra-fine particles) as a result of breathing emissions from the fuming collapsed material piles, on which hundreds worked with minimal protection. There were high levels of strange elements, some toxic, in very fine size modes, predictably harmful to health.

As soon as I had results in early January, I called EPA Region II, and was told that it was none of my business. The EPA contact person asked just two questions: "Who asked you to do it? Who paid for it?" They had zero interest in our findings. Then I asked the University of California's Washington lobbyist to present our material to the committee headed by then-Senator Hillary Clinton on this topic. The committee was scheduled to conduct hearings later that month, and UC contacted her staff and mentioned our work. The Senate staff said that our work not needed, as they already had their experts lined up, including a senior professor from New York University. When the hearing was finally held, the NYU professor testified that his

data showed that the aerosols experienced in New York City were regional in nature from upwind sources, and not the WTC smolder pile. I was aghast.

Finally, I called my friends at EPA research in North Carolina, and their first question was "What did you find?" It turns out they at they were not even allowed to go to New York City to help because it was "a regulatory matter." Some of them went anyway. So, frustrated at every turn, we made our results public in a news conference in Davis. Our work was added to work other work done in September but only now made public. It showed the dust was as basic chemically as Drano, and hence very irritating and damaging to mucous membranes, information that had been given to the EPA in September but never released. We got enough ink to get invited to come to a House of Representatives hearing in New York City at the end of February, with the U.S. EPA Ombudsman in attendance. I was hesitant to go, but Sylvia Wright of the UC Davis News Service office said we must go. So Sylvia, my wife Ginny, and I headed off to New York.

The hearing was bizarre. I was grilled for about an hour, under oath, by the Ombudsman's lawyer, replete with leading and compound questions and trickery. They were trying to get at what EPA Administrator Christie Whitman knew about the dangers of the WTC smoke and when she knew it. The hearing also focused on asbestos, of which we saw very little. Ginny was beside herself because I did not have my lawyer to deflect unfair questions. A large audience there wanted EPA blood. I was very careful to avoid saying any more than I knew.

I subsequently met with Dr. Stephen M. Levin, who was treating WTC workers, and a reporter for the *New York Daily News* who, unlike the *New York Times*, was covering the story well. Levin was director of the World Trade Center Worker and Volunteer Medical Screening Program. I then got a call from ABC News, which did an interview with me at the WTC site that ran on the national news. Even though six months had passed since the collapse of the towers, a bitter burned insulation-like smell permeated the air, and the pile was still hot. Sylvia took some photos at the interview that I have shamelessly used everywhere. Now people knew who we were, and that, unlike the EPA, we were worried about current and future health impacts. The "air is safe to breathe" comment was in Whitman's September press release, which had declared air at the WTC site and vicinity as "…safe to breathe," but it was not. We began getting some strong negative pushback in response to our work.

As a result of my visibility I got into contact with Cate Jenkins. Cate, a senior EPA chemist, had become a whistleblower who accused the EPA of underestimating the toxicity of the fumes in the World Trade Center vicinity. She was under some sort of protection, and people sent her the most amazing information, which she then copied to us all. We added our results to her network, and received all sorts of documents. Some of these were reports that would suddenly appear on the EPA website, only to be removed the next day. Some sort of fix was in play!

The next action was something new to me. A good friend at U.S. EPA phoned me and leaked that the EPA was funding a grant at a famous old New York university to challenge my data. He apologized to me, and I allayed his concerns.

In such situations my only resource was the peer-reviewed literature, which we prepared and submitted. I have never seen that other group's report (which was never released), but my data is published in the peer-reviewed literature. One reviewer was so set against our publishing the data (see Figure 8-5) that the editor had to remove him from the referee list, since everybody else was effusive in praise of our work. Not only was it important, with the help of the Livermore lab, but it also was in many ways the most complete aerosol event analysis ever done, with seven different analytical methods, some done for the first time (Cahill et al., 2004).

I met with and challenged a senior NYU professor on in this testimony before Hillary Clinton. It turns out that he had made measurements, but at the surface and in the wrong direction from winds, so despite being closer than we were, he did not see the plume. He did not have the capability we had with the DRUM and its three-hour time resolution, vital for seeing plumes from the collapse pile.

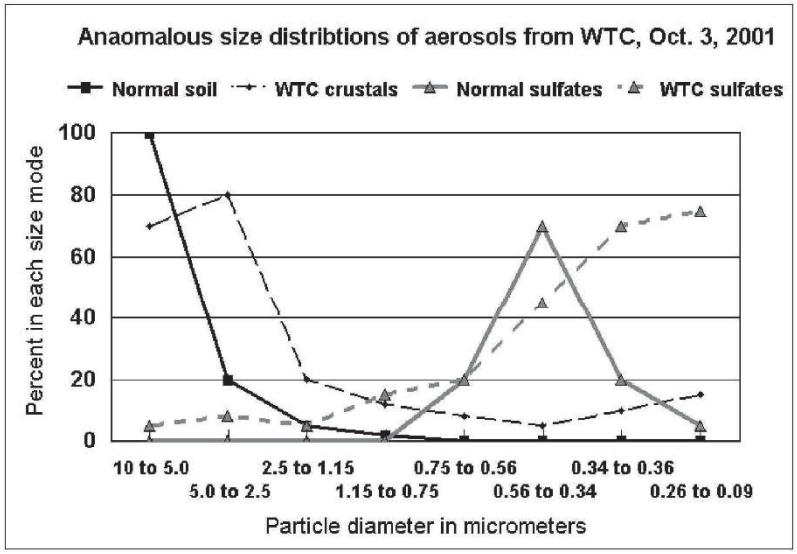


Figure 8-5. Anomalous size distribution of World Trade Center aerosols. The unusual aerosols from 2.5 μm to 0.75 μm were as caustic as Drano, burning throat and bronchial membranes.

Things began to unravel for the Bush Administration just before the September, 2003 meeting of the American Chemical Society in New York. The year before, at a national American Association for Aerosol Research meeting in North Carolina, I was taken aside by two investigators from the Office of EPA Inspector General Nikki Tinsley. She was about to issue an extensive report showing how the press releases of Christie Whitman, including cautions on health impacts, had been truncated by the White House before release. This was especially true for an EPA release in September that "... air was safe to breathe and the water safe to drink." But the next phrase was deleted by the White House. My paraphrase: "However, our measurements raise concerns for working on the (collapse) pile and people coming back to work closer than Water Street." This White House emasculation of Christie Whitman's statement was widely

reported, and probably helps explain the White House sensitivity to what came next, with me as the target, since my work was cited more than 10 times in her report.

She had compared the press releases that EPA Administrator Christy Whitman wrote with statements that the White House finally released, and found key phrases of concern had been deleted and other false comfort inserted. Tinsley released her report in August 2003, just a month before a major American Chemical Society (ACS) meeting in New York City that included a major session on WTC results. The ACS decided to hold its own news conference, and selected me and one other colleague to present our work, first on the dust cloud that spread immediately upon the collapse of the buildings, then my work on the plume from burning debris that continued to smolder throughout the days and weeks following the collapse. This announcement generated extensive news coverage.

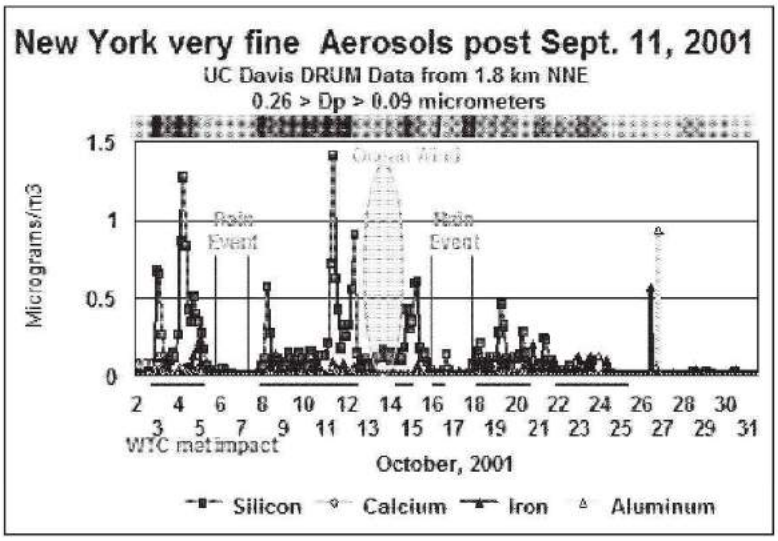


Figure 8-6. Assessment of very fine dust at the World Trade Center site.

With Sylvia's help we prepared a news release:

Trade Center debris pile was a chemical factory, says new study

The fuming World Trade Center debris pile was a chemical factory that exhaled toxins in a particularly dangerous form that could penetrate deep into the lungs of rescue workers and local residents, says a new study by UC Davis air-quality experts.

The new work helps explain the unusual pollutants and extraordinarily high concentrations found by an earlier UC Davis study, the first to identify very fine metallic aerosols in unprecedented amounts from Ground Zero. It will be essential to understanding the growing record of health problems.

The conditions would have been "brutal" for people working at Ground Zero without respirators and slightly less so for those working or living in adjacent buildings, said the study's lead author, Thomas Cahill, a UC Davis professor emeritus of physics and atmospheric science and research professor in engineering.

"Now that we have a model of how the debris pile worked, it gives us a much better idea of what the people working on and near the pile were actually breathing," Cahill said. "Our first report was based on particles that we collected one mile away. This report gives a reasonable estimate of what type of pollutants were actually present at Ground Zero.

"The debris pile acted like a chemical factory. It cooked together the components of the buildings and their contents, including enormous numbers of computers, and gave off gases of toxic metals, acids and organics for at least six weeks."

Two days later, two of my secret sources independently informed me that a copy of my press release from my ACS presentation had arrived on George Bush's desk, with a yellow sticky note saying, "Look what UC is doing to us." Both of my sources agreed that "Bush had a cow" and told the Secretary of Energy to respond appropriately.

So the next Monday, after I had returned to Davis, I was called to a meeting with the vice chancellor of research and the dean of engineering, the organization that administered most of my grants. I was truly expecting praise, but instead got a scolding. The director of the Lawrence Livermore National Laboratory (LLNL), which at that time operated under the management of the University of California, had:

a) terminated all of the grants of my research group (LLNL previously had given us $16K for work at the World Trade Center);

b) cut my access to my colleagues at Livermore (permanently lost);

c) My New York colleagues who worked for DOE was suddenly retired, and

d) the building we had used was barred from further studies.

When I got back, Livermore asked UC Davis administrators to order me to pen an apology because I had not first sent my press release for review at Livermore and for using data that Livermore had not approved for release.

I was stunned, but responded first by showing the vice chancellor the peer-reviewed and published article in the journal *Aerosol Science and Technology* (*AS&T*) giving Livermore credit for the data and grant, and second by pointing out that because the data was public, we and Livermore personnel could report and apply the data as we wished. I did at least write an explanation, but I was pissed and lost all respect for him. Two weeks later, I received through a roundabout route a note from the director of the Livermore lab indicating that "he really liked the work."

In addition,

a) The EPA had contracted with a famous old New York university to refute my data, (note: their report was never released. My data is in the peer reviewed literature),

Happily, none of the White House pressure reached the National Science Foundation, which was funding both the large Aerosol Characterization Experiment-Asia (ACE Asia) program and the new program to measure aerosols on the Greenland ice cap (see Chapter 20, Global climate change).

My data drew criticism because it was so unlike anything anyone had ever seen before, especially anomalous levels of vanadium, silicon and other materials in very fine size modes that would lead deep into the lung. I gained some insight from my old buddy, Professor Ian Kennedy of the UC Davis Department of Engineering, an expert in ultra-fine metals. He told me that this was similar to situations seen in the late 1980s hospital incinerator probes in which metals that

should not be seen at the temperature of combustion were present, and tied to chlorine in the waste.

A search of scientific literature led me to exactly what I needed. I made a model, and every toxic element I expected to see, based on the chlorine, was there, in the right ratios, and every element my model said should not be there was absent. The article I wrote, one of my best, (Cahill et al, 2005), laid that question about the products of high-temperature combustion to rest.

Lawyers representing first responders contacted me, and I agreed to help them establish a fund to cover the detrimental health effects I had predicted. As the health effects began to show up, we gained traction. It took a while, and cost me three days of time for discovery of all my files at UC Davis by the opposition lawyers, but we won a massive settlement in favor of the first responders.

When *New York Daily News* investigative reporter Juan Gonzalez published his 2004 book "Fallout: The Environmental Consequences of the World Trade Center Collapse", he cited me as one of three "environmental heroes," along with Cate Jenkins – my EPA "leak" source protected by her whistleblower status. I was just lucky to have the ability to respond quickly and effectively following discovery of the air quality data. Any of my colleagues and all U.S. EPA scientists would have done the same given the opportunity. In fact, many EPA scientists snuck up to New York from North Carolina and also made measurements despite the ban.

In response to a massive lobbying effort by the first responders and John Stewart, in December 2015, Congress indefinitely extended the fund for which we had fought. This is terribly important because the rate of heart attacks from ischemic heart disease will soon begin to rise among WTC first responders and demolition workers. While indefinite extension of the fund is great news, attaining that authorization should not have been so hard. After all, if the City of New York, the federal OSHA safety people, and the U.S. EPA had done their jobs and followed laws and regulations, these thousands of people would not be sick today.

At the conclusion of the 10-day rescue phase to find and rescue trapped people, when survivors were no longer being found, the rescue workers should have been ordered to back away. At that point, the fire department should have deployed personnel wearing full-face canister respirators, and the operation should have shifted to concentration on extinguishing the fires before attempting cleanup. I cringed when I saw firemen with useless paper masks raking

debris in search of firemen's badges. California firefighters returned from the WTC site suffering from pneumonia because the caustic fine dust had burned their sensitive nose and throat membranes.

The story does not end here. As the health effects I had predicted started to appear, Eric Gillin, a reporter for *Esquire* magazine, became nervous. He had been standing close to the WTC south tower when it collapsed, and saved the backpack he had been carrying at the time. He had sealed the dust-covered backpack in a plastic bag, which he had been keeping in a closet for five years. He asked if I could I learn something from analyzing the particles on the bag. Recall that we had no aerosol data from the monster collapse clouds.

So I agreed to help, and designed an instrument to gently vacuum dust off fabrics at about the same wind velocity at which they had been deposited. Gillin came out to Davis, camera crew in tow, and we did the work. The bag's contents included a book, some papers, a transit schedule, and the debris-caked shirt he had been wearing that day as he had been enveloped in the furiously virulent cloud of dark grit that cloaked lower Manhattan.

When we called Gillin after completing our analysis of the results, he was really nervous, but then we told him most of the collapse dust that had coated him and his bag was harmless gypsum from the drywall used in the center walls of the WTC. His relief was palpable.

Gillin's resultant article, titled "The Bag," was published in the April 2007 issue of *Esquire*. It begins on page 133, immediately following a photo of Hilary Swank's feet. I recommend you read the article yourself – it is an accurate representation and well written. Upon my request, *Esquire* published an accompanying sidebar article on the smolder fumes, showing how toxic they were. Good work on all sides.

Amazingly, the story still does not end there. About a month after publication of the *Esquire* article, I received a furious and insulting phone call from someone asking who had paid me off to cover up the WTC conspiracy. Without realizing it, my data showed that there was no trace of thermite (or thermate) in the south tower collapse, driving a garlic-coated stake through the center of their ridiculous hypothesis. I still received nasty emails with similar accusations about twice a month. But I also get praise from my physics colleagues at meetings for sticking my neck out when the EPA-White house cover-up of the dangers the dust posed to workers was in full play.

References

The best summary:

Gonzales, Juan, **Fallout**, The New Press, New York (2002)

The best read:

Gillin, Eric **The Bag**, Esquire magazine, April 2007

And then for the masochists….

Cahill, Thomas A., Steven S. Cliff, Kevin D. Perry, Michael Jimenez-Cruz, Graham Bench, Patrick Grant, Dawn Ueda, James F. Shackelford, Michael Dunlap, Michael Meier, Peter B. Kelly, Sarah Riddle, Jodye Selco, and Robert Leifer. 2004. **"Analysis of Aerosols From the World Trade Center Collapse Site, New York, October 2 to October 30, 2001**." *Aerosol Science and Technology* 38: 165–183. doi: 10.1080/02786820490250836.

- Cahill, T.A., S.S. Cliff, J.F. Shackelford, M.L. Meier, M.R. Dunlap, K.D. Perry, G.S. Bench, and R.Z. Leifer. 2005. **"Very Fine Aerosols from the World Trade Center Collapse Piles: Anaerobic Incineration?**" *American Chemical Society Symposium Series*, 919: 152–163. doi:10.1021/bk-2006-0919.ch009.

Tales from the Field: Our essential volunteers

This is a good time to celebrate the volunteer experts that again and again have set me on the right path. I have learned to stop and listen to those people living within the problem. In the last chapter, we talked about Arden Middle School right downwind from the Watt Avenue stop lights. The Principal asked us to measure because of her concerns and being fully aware of how a bad result could harm her school's reputation. . We did it as a favor to her, not expecting much. Well, she was right, I was wrong, and the Watt data at Arden Middle School helped unlock the mystery of the excess heart attacked deaths all over California. Later in Chapter 14, we will meet a rancher near Moneo Lake who was worried enough about the dust that he volunteered his ranch as a location for our (unauthorized) air sampler. I can think of cores of other examples, including right now a high school in China where students are collecting samples for us. Now we always go to the site, sit down with locals over coffee or a beer, and listen.

Section C

Mitigation – Yes, You Can Do Better

The threats outlined in the Chapters 7 and 8, diesel carcinogens and ultra-fine metals, impact the population as a whole most severely for people who live near heavily traveled roadways. In Chapter 9, we address how you can evaluate the degree to which you are at risk from local roadways, and Chapter 10 starts the discussion of how you can make your indoor are essentially free from these threats. Detailed instructions of how to build an inexpensive but highly effective indoor air filtration system are given step by step in Appendix B.

Chapter 9

Outdoor Air Quality – My Way or the Highway

Living with heavily trafficked roadways

Introduction

My students and I had done very detailed study of pollution from Los Angeles freeways, data that caused Ronald Reagan's Air Resources Board to try to shut me down. (Chapter 11) But with the election of Jerry Brown 1.0 as California's governor in 1976, pretty much everybody thought that our troubles were over. Abundant data showed that only with the catalytic converter on cars could Los Angeles lower its appalling ozone impacts, which also required the removal of lead from gasoline. I also helped remove the sulfur from gasoline. California was the only state that could set standards more stringent than those of the U.S. EPA because California had initiated pollution control measures 20 years before the federal Clean Air Act was written. The stunning success that these anti-pollution measures caused many of us to assume that our problems were over, and we left for other tasks.

EXHIBIT 2

Aerosol Science and Technology
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/uast20

Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 1: 2003-2007

Thomas A. Cahill [a b], David E. Barnes [a], Nicholas J. Spada [a], Jonathan A. Lawton [a] & Thomas M. Cahill [c]

[a] DELTA Group, University of California, Davis, California, USA

[b] The Health Effects Task Force, Breathe California of Sacramento—Emigrant Trails, Sacramento, California, USA

[c] Division of Mathematical and Natural Sciences, Arizona State University West Campus, Phoenix, Arizona, USA

Available online: 04 Jul 2011

To cite this article: Thomas A. Cahill, David E. Barnes, Nicholas J. Spada, Jonathan A. Lawton & Thomas M. Cahill (2011): Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 1: 2003-2007, Aerosol Science and Technology, 45:9, 1123-1134

To link to this article: http://dx.doi.org/10.1080/02786826.2011.582194

Aerosol Science and Technology, 45:1123–1134, 2011

ISSN: 0278-6826 print / 1521-7388 online
DOI: 10.1080/02786826.2011.582194

Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 1: 2003–2007

Thomas A. Cahill,[1,2] David E. Barnes,[1] Nicholas J. Spada,[1] Jonathan A. Lawton,[1] and Thomas M. Cahill[3]

[1]*DELTA Group, University of California, Davis, California, USA*
[2]*The Health Effects Task Force, Breathe California of Sacramento—Emigrant Trails, Sacramento, California, USA*
[3]*Division of Mathematical and Natural Sciences, Arizona State University West Campus, Phoenix, Arizona, USA*

The enhancement of mortality associated with cardiovascular and specifically ischemic heart disease (IHD) has been observed in the southern California Central Valley since at least 1990, and it continues to be a major source of mortality. While there is a strong statistical association of IHD with wintertime $PM_{2.5}$ mass, the causal agents are uncertain. Medical studies identify some potential causal agents, such as very fine and ultrafine metals, but they have not been fully characterized in most Central Valley regions. To provide improved information on specific and potentially causal agents, a five site aerosol sampling transect was conducted from Redding to Bakersfield during a 17-day period of strong stagnation, January 5–22, 2009. Mass and elemental components were measured every 3 h in eight particle size modes, ranging from 10 to 0.09 μm, while the ultrafine particles (<0.09 μm) were collected on Teflon filters. Ancillary studies were performed including direct upwind–downwind profiles across a heavily traveled secondary street near a stoplight. Very fine and ultrafine iron, nickel, copper, and zinc were identified as vehicular, with the most probable sources being brake drums and pads and the lubrication oil additive zinc thiophosphate. High correlations, many with r^2 > 0.9, were found between these vehicular metals and IHD mortality, enhanced by the meteorology, terrain, and traffic patterns of the southern Central Valley. The braking systems of cars and trucks must now be considered along with direct exhaust emissions in estimating the health impacts from traffic.

Received 7 August 2010; accepted 27 November 2010.

The authors first wish to gratefully acknowledge the support of the Resources Legacy Fund of Sacramento, California, for encouragement and financial support for this study.

The staff of all of the Air Resources Board (ARB) sampling sites were key to successful execution of the project.

The authors also wish to gratefully acknowledge the financial support of the Sacramento Metropolitan Air Quality Management District under its CEO, Larry Greene.

The authors wish to acknowledge the input and oversight of the Health Effects Task Force (HETF) of Breathe California of Sacramento-Emigrant under Jananne Sharpless, Chair; Betty Turner, consultant to the HETF, and especially members Ralph Propper and Earl Withycombe. Helpful suggestions and review were provided by William Wilson, US Environmental Protection Agency (EPA).

Address correspondence to Thomas A. Cahill, DELTA Group, University of California-Davis, One Shields Ave., Davis, CA 95616, USA. E-mail: tacahill@ucdavis.edu

[Supplementary materials are available for this article. Go to the publisher's online edition of *Aerosol Science and Technology* to view the free supplementary files.]

INTRODUCTION

The task of determining the causal factors that lie behind the statistically sound association of mortality with aerosols continues to labor under severe difficulties. Reliance on Federal Reference Method (FRM) methodologies, even if enhanced by periodic compositional analysis, does not provide enough information to allow health research scientists to identify causal factors (Lippmann 2009). Intensive research studies, which can provide such data, are so expensive as to limit their scope in space and time and thus pose problems with statistical significance. An alternative is to identify regions with persistent and specific health impacts of suspected aerosol origins and then augment monitoring data and special studies to provide a suite of data from which causal factors may be identified. However, other factors such as meteorology, land use, and socioeconomic factors can often weaken the significance (Pope et al. 1995). The California Central Valley, however, is a region of such homogeneity that such efforts there might be fruitful.

The southern part of the California Central Valley, the San Joaquin Valley, is the largest contiguous area of the United Sates in serious violation of both ozone (summer) and $PM_{2.5}$ (winter) ambient air quality standards. While the summer ozone levels are relatively uniform over the Central Valley, the winter PM_{10} and $PM_{2.5}$ concentrations vary strongly, from low in the northern Sacramento Valley to high in the southern San Joaquin Valley. During individual winter stagnation episodes, the south to north

(Bakersfield to Redding) mass ratio is up to a factor of 8 for PM_{10}, and a factor of 5 for $PM_{2.5}$.

In addition to improving monitoring data, a series of extensive research studies by and through the California Air Resources Board (ARB), such as California Regional Particulate Air Quality Study (CRPAQS 2001), Central Coast Ozone Study (CCOS), and Fresno Asthmatic Children's Environment Study (FACES), were initiated in 1999 through 2001 that greatly added to our knowledge of San Joaquin Valley aerosols. However, most field data were taken before the current understanding of aerosols and cardiovascular impacts was achieved (Devlin 2003, Lippmann 2009) and thus lack some critical measurements, especially ultrafine metals (Chow et al. 2006, 2007, 2008; Chen et al. 2007; Kleeman et al. 2009). One of the major results of these studies is an understanding that most of the $PM_{2.5}$ mass in the winter in the San Joaquin Valley is ammonium nitrate and wood smoke, neither of which are a known cardiovascular threat.

The mortality data in the entire Central Valley are relatively uniform for three of the four major causes of mortality, pulmonary disease, stroke, and cancer, but the 4th and most important, heart attacks from all causes, is higher by about 20% in the central and extreme southern California Central Valley [California Department of Health Services (CA DHS) 2010] and especially in Bakersfield. For one specific and major component of heart disease, ischemic heart disease (IHD), the incidence rises to about 35% (CA DHS 2010). In this research, we have measured some of the components of aerosols found by recent health studies most likely to be causal factors in this statistically strong association to cardiovascular disease, namely very fine and ultrafine metals, and size and compositionally-resolved organics (Cahill 2010), over the entire Central Valley, with the goal to enhance data from the earlier studies and provide additional material for future epidemiological analyses.

EXPERIMENTAL METHODS

Study Region Geography and Climatology

The Central Valley of California (Figure 1) has remarkable uniformity in terrain and meteorology. It is one of the richest agricultural areas in the world, with two major metropolitan areas, the Sacramento–Stockton and Fresno, with smaller cities of a few 100,000 to small towns spread throughout the Valley. The Valley is a major transportation corridor for road and rail traffic but generally lacks strong industrial sources. There are active areas of oil extraction near and north of Bakersfield. The Central Valley offers an ideal situation to examine the effects of pollutants on health since many potential confounding factors, such as meteorology, land use patterns, socio-economic factors, and cigarette smoking, are very similar throughout the Valley (Cahill et al. 1998; note that the values in that report are slightly different in the present report since we have now available CORE Report #2 (1996), while the original report used CORE Report #1 (1994)).

FIG. 1. Map of the Central Valley of California. The northern part is referred to as the Sacramento Valley while the southern part is called the San Joaquin Valley. The areas within the dotted circumference vary in altitude from almost sea level in the Delta to a few hundred feet in elevation. The small arrows denote the typical winter wind patterns (Hayes et al. 1984). The cities marked were used in this study.

In summer, high temperatures in the Valley (mean daily high, July, 36°C ± 1°C) lower the surface pressure and draw massive inputs of marine air into the Valley from the San Francisco Bay, bringing with it oceanic aerosols and typical urban pollutants enhanced by the major petrochemical industrial sites at the Carquinez Strait, between Sacramento and San Francisco. These winds often funnel south down the entire San Joaquin Valley, south of the strait, but less often funnel north up the entire Sacramento Valley, north of the strait. Rainfall in the Valley is rare during the period from May through October (Hayes et al. 1984).

In winter, the Central Valley air basin tends to become stagnant due to its flat valley floor and circumferential mountains, except at the Straits (Figure 1). There is slow drainage of cold air from the Sierra Nevada Mountains each night to the Valley floor (mean daily low, January, 3°C ± 1°C). The air drains slowly, at the rate of about 50 km/day, from both the northern and southern ends of the valley towards the lowest point, the Sacramento–San Joaquin Delta, southwest of Sacramento and directly east of the Carquinez Strait. This pattern results in persistent stagnation episodes that are periodically interrupted by synoptic storms.

Typical Pollution Patterns

The annual pattern of $PM_{2.5}$ mass reflects the effects of the winter stagnation, with elevated levels from about November through February (Figure 2). All valley sites have similar annual

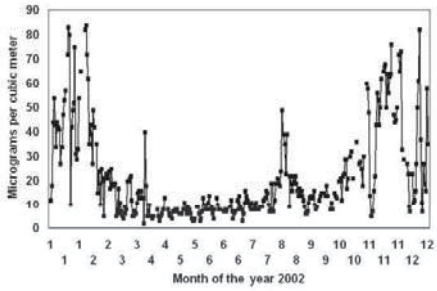


FIG. 2. Annual pattern of $PM_{2.5}$ mass as seen at Fresno.

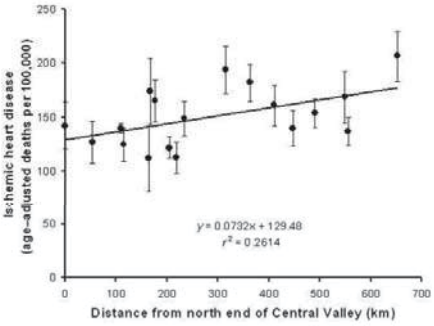


FIG. 3. IHD in the Central Valley of California, 2003–2007. Distances span from Redding in the north (0 km) through Chico (170 km), Sacramento (220 km), Fresno (400 km) to Bakersfield (680 km).

patterns, high in winter and low in summer. The $PM_{2.5}$ peak seen in August was from a forest fire in Oregon. While the southern reaches of the Central Valley have serious violations of federal and state mass standards (ADAM 2010), other parts of the valley that share agriculturally based land uses and meteorology do not exhibit serious violations of these standards. For PM_{10} mass, the ratio from Bakersfield in the south to Redding in the north can be as high as a factor of 9 in winter stagnation events, while for $PM_{2.5}$, the ratio can be as high as a factor of 5 (ADAM 2010). The pattern of winter air movement makes the high aerosol mass levels at Bakersfield difficult to explain, since the nighttime airflow into Bakersfield is from the mountains to the south, southeast, and east of the city. There is essentially no influence from the Los Angeles basin due to the blocking mountains. The air at Bakersfield then flows slowly north towards Fresno, which has generally lower $PM_{2.5}$ mass levels despite greater population and industry.

Epidemiological Data

Greatly improved data on mortality and morbidity became available circa 2001 from the California Department of Health Services (CA DHS 2010), which allow detailed analyses of death by hundreds of cause on an annual basis. These data show a persistent enhancement, 2003–2007, of IHD mortality of roughly 50% in the central region and at Bakersfield, at the extreme southern edge of the San Joaquin Valley, as compared with the northern valley (Figure 3).

Aerosol Sampling Methods

Aerosol samples were collected along a transect in the Central Valley to investigate the causal factors behind the increased mortality due to IHD in the Central Valley of California. Since routine air quality measurements were available in this region, we collected and analyzed aerosols not routinely measured by existing monitoring programs that were known or suspected to be causal factors in cardiovascular disease. Further, we selected a period of stagnation that maximizes winter particulate mass concentrations, avoiding the synoptic fronts and rain that periodically clean out the valley in winter. Using meteorological predictions, we simultaneously sampled continuously by size, time, and composition for 17 days starting on Jan 5, 2009, at five sites from the extreme north, Redding, to the extreme south, Bakersfield.

Rotating drum impactors (DELTA Group 8 DRUMs; Cahill et al. 1985; Raabe et al. 1988) were used at all sites to provide continuous samples capable of 3-h data in eight impaction size modes from 10 to 0.09 μm diameter plus an integrating Teflon after filter. The impaction samples were collected onto Apiezon-L greased Mylar stages (Wesolowski et al. 1977). Analyses were made for mass and elements from aluminum to molybdenum plus lead by synchrotron-induced x-ray fluorescence (Bench et al. 2002). The quality assurance validations, including a year-long inter-method comparison to ARB's FRM particular samplers, are summarized in the supplemental information. For the ARB side-by-side over the entire year, agreement for $PM_{2.5}$ mass was better than $\pm$10%, DRUM versus FRM, with the winter agreement much better than that, a few percent, probably because of higher winter mass values. Note that 49 individual mass values from a DRUM with 3-h time resolution and 6 sub-2.5-μm size cuts plus a <0.09 μm after-filter were required to match a single 24-h $PM_{2.5}$ mass value.

Aerosols destined for organic analyses were likewise collected with DRUM samplers at the same time and locations as the elemental samplers. However, the organic samples were analyzed averaging over the entire 17-day study, and the aerosols were collected onto fired aluminum substrates (Cahill 2010).

The study included three components, all conducted in winter conditions and using the same equipment, including integrating ultrafine Teflon filters: (1) an initial year-long study of the DRUM sampler side-by-side with the ARB's FRM at the

Sacramento test site at 13th and T Street to establish equivalency of the sampling and analysis (Cahill and Barnes 2009), (2) a simultaneous transect across a heavily traveled secondary street to identify very fine and ultrafine aerosols from roadways, and (3) the main transect study in winter, 2009. Summaries of these studies are included in supplemental information.

For the transect study, samples were collected at five existing ARB and district monitoring sites covering the entire Central Valley (Figure 1):

Redding (roof of Health Department),
Chico (ARB Manzanita Avenue site),
Sacramento (ARB 13th and T Street site),
Fresno (ARB First Street site), and
Bakersfield (ARB California Street site).

Paired UC Davis DELTA Group 8 DRUM samplers were used at all sites except Sacramento, which had to use a $PM_{2.5}$ 3 DRUM for lack of equipment. One 8 DRUM was used at each site for mass and elements (3-h time resolution), sampling onto lightly greased Mylar, and the other for organic matter (17-day average), sampling onto fired aluminum foils. All included identical Teflon ultrafine filters that integrated the entire 17-day period. The parameters measured at all sites include but are not limited to

1. time-averaged ultrafine particulate elemental composition, Al to Mo, plus lead, and mass, $0.09 > D_p > 0.0$ μm aerodynamic diameter,
2. time-dependent (3 h) mass and elements (see above) for the eight particle sizes 10.0–5.0, 2.5, 1.15, 0.75, 0.56, 0.34, 0.26–0.09 μm aerodynamic diameter,
3. time-averaged organic matter by size, 10.0–5.0, 2.5, 1.15, 0.75, 0.56, 0.34, 0.26–0.09 and <0.09 μm diameter, including polycyclic aromatic hydrocarbons (PAHs), sugars (including levoglucosan), fatty acids, and *n*-alkanes have been published (Cahill 2010).

RESULTS

Meteorology

After the sites were selected, deployment was delayed until weather predictions indicated at least a 10-day period of low winds and stagnation, conditions that produce the highest $PM_{2.5}$ mass. The prediction was accurate and the meteorology was favorable and allowed us to extend the study to a 17-day period characterized by high mass values and persistent hazes (Table 1).

Aerosol Mass Values

PM_{10} mass values were available at all sites on January 19, while all sites except Redding had daily $PM_{2.5}$ mass values collected by the ARB and local agencies (ADAM 2010). The $PM_{2.5}$ values were averaged over the entire 17-day study period

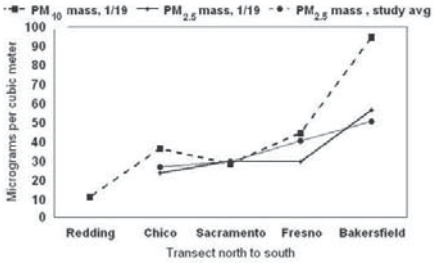


FIG. 4. $PM_{2.5}$ mass values were available every day, but only January 19th had PM_{10} mass at all valley sites. The high PM_{10} to $PM_{2.5}$ ratio on January 19 is unusual and unexplained.

and were typical of prior winter stagnation events (Table 2 and Figure 4). Looking in more detail, we can see that the north to south increase in average $PM_{2.5}$ mass is driven not as much by the increase in mass on a given day but the number of days that saw the high mass values.

Aerosol monitoring by state and local agencies with compositional data for $PM_{2.5}$ aerosols was only available at the Fresno site via the IMPROVE sampler (Malm et al. 1994). The evolution of the aerosol event is shown in Figure 6, showing that the study period would represent a winter day in violation of the $PM_{2.5}$ mass standard. The important role ammonium nitrate plays during these aerosol episodes is clearly indicated.

Size-Resolved Mass and Inorganic Aerosols

For the period from January 5 through 22, over 6400 measurements were made of mass and inorganic elements in nine size modes, measured every 3 h except for the integrating ultrafine filters. In addition, a simultaneous study (Cahill 2010) measured organic aerosols in four classes (alkanes, PAHs,

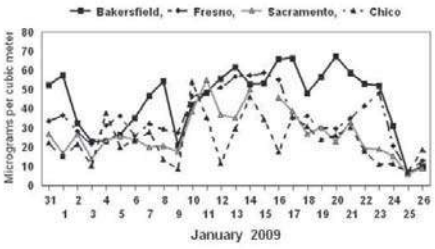


FIG. 5. $PM_{2.5}$ mass values before, during, and after the study period of January 5–22, 2009.

TABLE 1
Summary of meteorological parameters during sample collection period of January 5–22, 2009. The values reported are the average over the entire aerosol sampling period except for rainfall, which includes the rain on the days of setup and take down, January 5 and 22

Parameter	Redding	Chico	Sacramento	Fresno	Bakersfield
Average temperature (°C)	11.3	9.6	9.0	9.4	10.6
Average high (°C)	19.3	15.5	16.1	15.4	16.5
Average low (°C)	3.0	3.7	1.7	3.2	4.4
Relative humidity (%)	56.4	71.6	73.4	71.8	66.4
Average wind speed (m/s)	1.92	1.27	0.47	0.62	1.17
Rain (cm)	1.2	2.2	2.5	1.2	0.1
Number of rain events	4	3	3	2	2
Number of fog events	0	2	11	2	2
Average visibility (km)	14.6	12.3	7.1	6.9	6.6

sugars, and organic acids) in nine size modes at all sites. In this article, we focus on those particles that have the best support from the health literature as having the potential for causing or exacerbating IHD. Thus, we focus on only those insoluble particles in the very fine (0.26–0.09 μm) and ultrafine (<0.09 μm) modes that are able to penetrate deeply into the lung and pass into the cardiovascular system. However, before we focus on these particles, we need to examine the overall aerosol behavior important to eventually isolate the sources of these particles.

Using the well-studied Fresno site, we can see that the size distribution roughly matches expectations with a few differences (Figure 7). In Figure 7, three points stand out. First, the DRUM sampler with its coated substrates operated well, with negligible soil mass penetrating into the accumulation mode as shown by the calcium results. Second, there is a distinct deviation in the size profile of iron, which shows an enhancement in the 1.15–2.5 μm size mode not seen in other soil elements. Third, potassium becomes enhanced in the finest modes, clearly from non-soil sources. It is also much finer in size than typical wood smoke, which almost always peaks in the 0.34–0.75 μm mode.

Examining the non-soil iron anomaly (Figure 8), the size and 3-h time data show enhancement in the 2.5–1.15 μm mode each night not seen in other soil elements and not seen at any other valley site. The very fine iron often tracks the fine iron, but sharp deviations occur, indicating complex source behavior. Bakersfield lacks time information due to a system failure, and thus its behavior in time is unknown.

Further insight on zinc in Fresno can be obtained by examining zinc over most of a year (Cahill et al. 2003). The persistent presence of very fine zinc occurs throughout the entire year and becomes dominant in wintertime, closely associated with other vehicular aerosols. The zinc to very fine mass ratio was close to that seen in laboratory diesel tests (Zielinska et al. 2003).

Data on Very Fine and Ultrafine Aerosols

Very fine aerosols were collected on DRUM stage 8, 0.26 to 0.09 μm, and integrated over the 17-day study period to match the integrating ultrafine filters. Ultrafine aerosols were collected on the same 47-mm Teflon filters as the organic samples and averaged over the same 17-day period. The filters were analyzed by scans of S-XRF every 0.5 mm across the filter diameter. All filters were uniform except for Chico, which had contamination on one edge. This was easily avoided by modifying the averaging program. Two different averages were generated: one by summing the spectra, then analyzing and the other by averaging the typical eighteen individual elemental results.

In Table 3a, we show a summary time averaged DRUM very fine data and, in Table 3b, the integrated ultrafine filter data for the study period.

TABLE 2
Mass values for PM_{10} on January 19 and $PM_{2.5}$ averaged from January 5 though January 22, 2009. The value of ~9 for $PM_{2.5}$ is estimated assuming the same $PM_{10}/PM_{2.5}$ ratio as the other cities

Site	Redding	Chico	Sacramento	Fresno	Bakersfield
Size (μm)	PM_{10}	PM_{10}	PM_{10}	PM_{10}	PM_{10}
Mass (1/19) ($\mu g/m^3$)	12	37	29	46	95
Size (μm)	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$
Mass average ($\mu g/m^3$)	~9	27.3	30.2	40.9	51.0

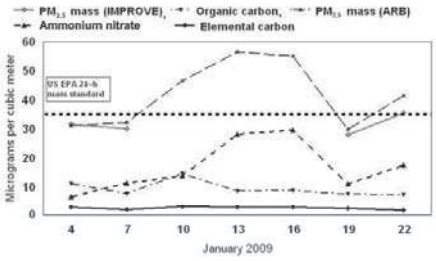


FIG. 6. IMPROVE and ARB $PM_{2.5}$ data at the Fresno site during the study. Note the dominance of ammonium nitrate in the mass maxima.

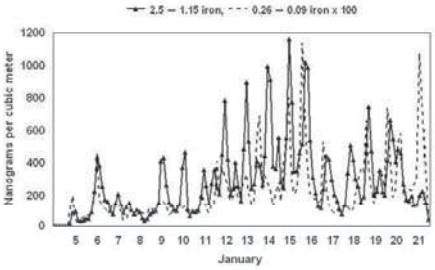


FIG. 8. Fine and very fine nonsoil iron at Fresno. Recall that the study began directly after a rainfall event and had almost no winds to stir up dust. Thus we propose that most of the iron is roadway and vehicle derived.

The values in bold represent vehicular sources identified in the next section of this article. The copper ultrafine values are suspect from contamination by copper containing filter holders. K_{non} is non-soil potassium, corrected by the Calcium content, and a standard IMPROVE tracer of wood smoke (Malm et al. 1994). MDL is minimum detectable limit. Uncertainties are nominally ±5%, and detailed quality assurance and uncertainties are in the supplemental information.

The correlations of sulfur (ammonium sulfate) and selenium are driven by the oil extraction and refining near Bakersfield (Figure 10). But there are strong associations between many metals and IHD in both the very fine and ultrafine modes. Although mass levels in the very fine and ultrafine modes are low, the concentration of metals was significant. Thus metals are a major contributor to particle numbers, many presumably in insoluble compounds. Examining spatial trends for very fine metals with known vehicular origins, we see at Bakersfield a clear north to south enhancement of many very fine metals that far exceeds the ×1.6 increase in $PM_{2.5}$ mass for the same period (Figure 9).

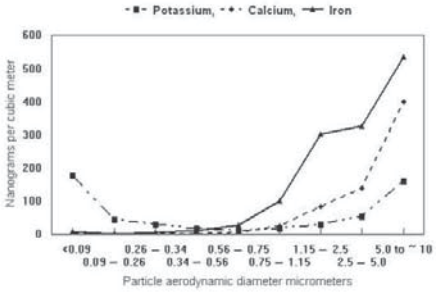


FIG. 7. Size distribution for Fresno aerosols.

The upward trend of sulfur must be interpreted in accord with the meteorology, which moves air from Bakersfield towards the Delta. Typical elements associated with vehicles include nonsoil iron, phosphorus, zinc, nickel, and copper. From the ratio present in the zinc thiophosphate in lubricating oil, there are clearly additional zinc sources present at all sites except perhaps Bakersfield.

In summary, there are significant contributions of metals in the very fine and ultrafine mode, many of which rise to their highest levels at Bakersfield (Figures 11 and 12) and correlate strongly with the IHD mortality data.

DISCUSSION

Sources of the Metals

The generation of metals in the ultrafine mode requires high temperatures and/or pressures. Thus, many sources of metals from vehicles, such as zinc from tire wear, are not candidates for sources of ultrafine aerosols. Two potential sources are engines, and especially diesel engines because of the high temperatures and pressures involved, and the braking systems in vehicles.

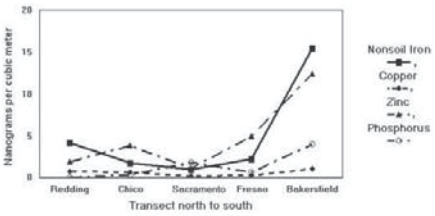


FIG. 9. Very fine transition metals with known vehicular sources, zinc and phosphorus from zinc thiophosphate in lubricating oil, iron, copper, and zinc potentially from braking systems.

TABLE 3a
Aerosol mass data from the study and their correlation to IHD mortality. Uncertainties are nominally ±5%, and detailed quality assurance and uncertainties are in the supporting materials. Concentration (ng/m^3) of very fine (0.09 to 0.26 μm) aerosols

Site	Redding	Chico	Sacramento	Fresno	Bakersfield	Correlation r^2 to IHD
Ammonium sulfate	45	82	75	120	580	0.98
Chlorine	<0.4	2.5	1.8	0.7	2.6	0.22
Phosphorus	**<0.1**	**0.4**	**0.8**	**0.7**	**4.0**	**0.98**
Potassium (non-soil)	18.0	54.1	10.9	45	32.7	0.00
Vanadium	<0.1	0.03	0.04	0.2	<0.1	0.04
Chromium	<0.1	0.01	0.01	0.6	0.2	0.04
Iron (non-soil)	**2.2**	**1.8**	**1.0**	**2.3**	**15.5**	**0.95**
Nickel	**<0.03**	**0.03**	**0.07**	**0.05**	**0.16**	**0.95**
Copper	**0.7**	**0.6**	**0.16**	**0.27**	**1.1**	**0.47**
Zinc	**1.9**	**3.9**	**1.1**	**4.9**	**12.5**	**0.88**
Arsenic	0.15	0.2	0.07	0.54	1.07	0.87
Selenium	<0.1	<0.1	0.09	0.10	0.24	0.95
Bromine	0.5	0.7	1.3	1.1	4.2	0.98
Lead	0.1	0.4	0.4	0.55	2.0	0.97

While there is considerable information on the total particulate emissions from vehicles, the information on ultrafine metals from vehicular exhaust is limited (Kleeman et al. 2000; Zielinska et al. 2003, 2004). The Zielinska et al.'s (2003) study involved detailed analysis of diesel exhaust. As part of the study, we analyzed for 32 elements collected in 11 tests with a 14-stage nano-MOUDI (lowest stage 0.01 μm). Sulfur, phosphorus and the metals zinc, calcium, and, in one of the 11 tests, lead, all peaked generally in the 0.10–0.056 μm modes (Zielinska et al. 2003). In addition to elemental and organic carbon, the tracer elements were assigned to sources: sulfur was from the fuel (CA low sulfur), the zinc and phosphorus from the zinc thiophosphate stabilizer in the lubricating oil, and calcium from an antacid additive. No other transition metals were seen in statistically significant amounts.

A second potential source of very fine and ultrafine metals is the braking systems of cars and trucks, since high temperatures and/or pressures are involved in this process. The brake drums have evolved from the massive, heat-conductive structures and generally well cooled in the past and now are often made of "grey iron," roughly 90% iron with the admixture of a few percent carbon, plus copper, silicon, and other metals in

TABLE 3b
Concentration (ng/m^3) of ultrafine (<0.09 μm) aerosols

Site	Redding	Chico	Sacramento	Fresno	Bakersfield	Correlation r^2 to IHD
Ammonium sulfate	122	215	270	470	999	0.95
Chlorine	2.5	5.1	0.6	3.0	0.5	−0.38
Phosphorus	**1.3**	**0.6**	**4.0**	**3.3**	**10.5**	**0.96**
Potassium (non-soil)	40.7	138.1	76.9	176.1	70.9	−0.05
Vanadium	0.05	0.15	0.10	0.21	0.02	0.00
Chromium	0.13	0.04	0.75	0.28	0.32	0.03
Iron (non-soil)	**3.9**	**3.9**	**14.3**	**7.7**	**27.7**	**0.88**
Nickel	**0.9**	**0.1**	**0.6**	**0.3**	**1.6**	**0.70**
Copper	**na**	**na**	**na**	**na**	**na**	**na**
Zinc	**8.6**	**11.2**	**14.3**	**22.4**	**12.3**	**0.00**
Arsenic	0.41	0.64	1.1	2.6	1.5	0.12
Selenium	0.47	0.64	0.62	1.1	0.9	0.05
Bromine	11.2	12.4	13.7	25.3	18.9	0.16
Lead	1.7	2.2	2.5	3.6	2.6	0.06

na: not available.

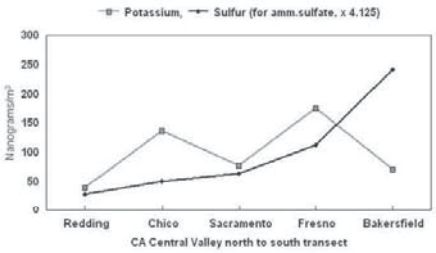


FIG. 10. Ultrafine potassium and sulfur.

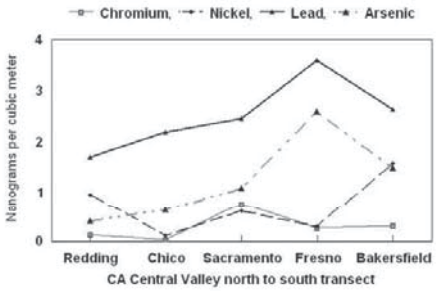


FIG. 12. Additional ultrafine elements.

smaller amounts, making them like brake pads an erodible surface. Brake pads are far more complex in composition and are traditionally designed to erode.

Limited information is available on a complete inventory of vehicular expendables. An early one was developed as a part of the extensive California freeway lead and particulate studies in the 1970s. In Cahill and Feeney (1973), the UC Davis vehicle fleet was studied for all forms of expendables, including fuel, oil, brake wear, exhaust train erosion, tires, etc., by directly measuring mass loss at replacement intervals. While many of the results are uncertain due to technological changes in the fuels and engines, measurements of brake drums and brake pads gave ~5 and 108 gm, respectively, at a replacement cycle of 58,400 km, or <1 and 15 mg/km. However, these data were based on asbestos-containing brake pads and may not be reliable, which also impacts the US Environmental Protection Agency (EPA) PART5 model estimate of 20.6 mg/km, based on 1985 data. In terms of brake drums, changes in brake drums from iron to "grey iron" containing graphite could materially increase that source of particles from prior values. Even with the uncertainties, it is clear that brakes contribute a significant component of typical vehicle total emission rates. However, averages are misleading because braking is only used for limited times. Thus the emission rates at stoplights and especially extensive mountain

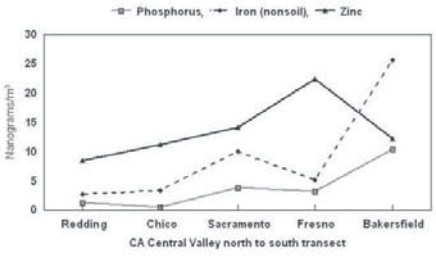


FIG. 11. Typical vehicular ultrafine metals.

down grades will be much higher than these values. It is worth noting that traditional dynamometer studies and roadside side studies near freeways are likely to miss brake wear as an emission source, thus these emissions may be largely unrecognized by the majority of vehicle emission and assessment studies.

Information on brake pad composition was reviewed by Kennedy et al. (2002) and Chan and Stachowiak (2004). The latter report, "A multitude of different brake pads have sprung onto the market in the post-asbestos brake pad revolution, each with their own unique composition," often proprietary. Brake pads comprise four subcomponents: (1) frictional additives, abrasives, and lubricants; (2) fillers; (3) a binder; and (4) reinforcing fibers for strength. The brake pads are described as metallic, semimetallic, with organic components, and organic. Asbestos to be used mainly as a reinforcing fiber in brake pads, and after its removal, a variety of materials have been used, including iron fibers. Some of them include potentially hazardous materials potassium titanate and sepiolite, a magnesium-silicon compound, both of which have potential health hazards. Organic aramaid fibers (e.g., Kelvar) and ceramics such as alumina and carbides are becoming more popular as prices decline. Fillers include a wide variety of organic (cashew hulls, old tires) and inorganic materials (barium sulfate is popular). The frictional components include graphite and metal sulfides including copper, antimony, tin, zirconium, and lead. Copper in particular has been identified as a problem in aquatic systems, and legislation to remove it from brake pads has been passed in the states of Washington and California.

While there is enormous variability in the data, as shown by the percentile distributions, the four main elements are iron, copper, zinc, and nickel (Table 4). In summary, there is a wide variety of very fine and ultrafine metals that may arise from brake drums and pads, but iron and copper are clearly two major components.

Information on ambient and near source very fine and ultrafine metals was derived from two additional studies in Sacramento. The first was a complete analysis of ultrafine (<0.09 μm)

TABLE 4
Summary of concentrations of elements in New Zealand brake pads, from largest to smallest concentrations of transition metals plus heavier elements. The distributions are shown to emphasize with wide variability between manufacturers

Element (ppm)	10th percentile	Median	90th percentile
Iron	11,700	18,300	190,000
Copper	29	5000*	116,000
Zinc	127	1630	37,400
Nickel	44	342	652
Manganese	143	315	1088
Lead	6	50	949
Barium	558	3195	6144

*Preferred interim median for copper due to high variability. Barium (median = 3100 ppm) was not resolved in our data due to interferences.

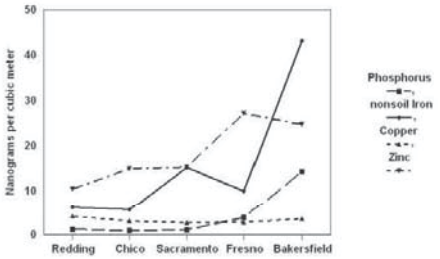


FIG. 13. Very fine plus ultrafine aerosols with known vehicular sources.

aerosols over a 2-week period, November–December, 2007, as part of an 8-month DRUM to FRM intercomparison with the California ARB in central Sacramento at the 13th and T Street ARB site (Cahill and Barnes 2009, supplementary materials), and the second was a 2007 study directly measuring aerosols across a heavily traveled (65,000 v/day, 1.5% diesels) secondary street in Sacramento, Watt Avenue (Cahill et al. 2007, supplementary materials).

One period in the Sacramento ARB intercomparison in November and December was chosen for mass closure through addition of surrogate organic measurements (Cahill et al. 1989; Malm et al. 1994). As anticipated, most of the ultrafine mass is organic (Table 5). Note also that the only nondetermined major species, nitrate, could not have been a major factor in Sacramento or the agreement would not have been as robust. Farther south in the San Joaquin Valley, nitrates are always a major factor. The presence of the fine transition metals in these quantities represents a very large number of particles. Note that the zinc value seen in Sacramento in 2007, 11.5 ng/m^3, is similar to the transect zinc value in 2009, 14 ng/m^3.

The second study was performed at Watt Avenue, the site of several studies on the impact of Watt Avenue on Arden Middle School (Cahill et al. 2007, supplementary materials). The Watt Avenue study utilized the same sampler as the ARB study, with two identical eight stage DRUM samplers with greased Mylar substrates and a 47-mm stretched Teflon after filter for the <0.09 μm ultrafine mode. The school sampler was 15 m downwind from the nearest traffic lane on the roof of the one story building and 50 m south of a stoplight on Arden Way that backed traffic up to and south of the Arden Middle School site. Thus considerable braking occurred directly upwind of the Arden Middle School sampler. The far upwind sampler was 500 m away in a residential neighborhood. Samples were collected continuously over 8 weeks in February and March, 2007. The results of these studies are shown in Table 5.

Through the direct upwind downwind measurements across Watt Avenue, the source of the metals seen in downtown Sacramento can also be shown to be largely derived from traffic sources despite the fact that the nearest freeway to the 13th and T Street site is over 1 km away.

Almost identical values of the same four elements are seen in Sacramento and especially in Bakersfield (Table 6 and Figure 13).

Since the ultrafine four elements, non-soil iron, nickel, copper, and zinc, and a few others, are traffic related, we can examine the mass levels in the Central Valley to see how the levels correspond to traffic. Since the wind flows downslope across Bakersfield from the south, where I-5 descends from the Grapevine and Hwy 58 descends from Tehachapi Pass. we used the sum of the cars plus 10 times the trucks, to roughly match to emission rates, and compared the ratio of traffic to $PM_{2.5}$ at the ends of the Valley and across the Chico and Fresno lateral transects for I-5 plus Hwy. 99. For the valley ends, the traffic ratio was 4.6 and the aerosol ratio 4.4, while for the central lateral transect, traffic was 2.1 and the aerosol was 1.4. Therefore the $PM_{2.5}$ mass values in the study were similar to the local traffic volumes, and the ultrafine metals at Bakersfield are from the two major highways south of Bakersfield climbing and descending the mountain passes.

Support for this hypothesis comes from historical data taken in Bakersfield in winter, 1974–1976 (Cahill and Flocchini 1974; Flocchini et al. 1976). The historical data show that particulate pollution from cars was high in Bakersfield in the 1970s data. Lead levels at Bakersfield, population circa 75,000 in 1975, in the average winter period were higher on average than in parts of the Los Angeles urban area. This is a clear indication that the local meteorology and geographical setting of Bakersfield results in it being highly impacted by vehicular sources, most likely vehicles on I-5 and Hwy 58 as they climb out of or descend into the valley.

TABLE 5
Measured and reconstructed ultrafine mass and elemental components in two studies in Sacramento, 2007. Watt 0.5 km is 500 m upwind; Watt 15 m is downwind. Sac Center is the ARB 13th and T Street site. There are no elemental carbon data or nitrate data, so the reconstructed mass is incomplete

	Watt ave. upwind (~ 0.5 km)	Watt ave. downwind (15 m)	Sacramento center
Major components	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
Mass (gravimetric)	Na	Na	2.04
Mass (recon.)	Na	Na	2.15
Organics (H)	Na	na	1.72
Sulfur (ammonium sulfate)	0.09	0.18	0.34
Chlorine (NaCl)	0.00	0.00	0.04
Soil	0.04	0.08	0.048
K non-soil (wood smoke)	0.04	0.14	0.053
Metals	0.01	0.09	0.035
Minor components	ng/m^3	ng/m^3	ng/m^3
Phosphorus	1.1	1.0	2.4
Vanadium	0.06	0.18	0.15
Chromium	2.2	1.3	0.45
Iron (non-soil)	5.2	34.9	17.0
Nickel	0.3	16.3	3.5
Copper	0.1	9.8	8.3
Zinc	1.2	17.3	11.5
Arsenic	0.16	0.46	0.6
Selenium	0.10	0.13	0.3
Bromine	0.8	1.1	3.7
Lead	0.5	2.3	4

Examining the current IHD mortality data from Figure 3, we observed that if we remove a totally arbitrary average background IHD mortality rate of 120 from the total rate (about 2/3 of the valley average rate), and matching the Bakersfield result, the excess IHD mortality roughly scales with local truck traffic on the major freeways (CalTrans 2010) and the very fine–ultrafine iron (Figure 14).

The pattern reflects the pattern that the two major north–south freeways, I-5 and Hwy 99, come close to each other only at Sacramento–Stockton and Bakersfield. Note that car traffic has a very different pattern because of the large automobile traffic on local Sacramento highways. When ultrafine aerosols alone are correlated with IHD mortality for the entire Central Valley, the highest correlations are for phosphorus ($r^2 = 0.96$) and iron ($r^2 = 0.88$), both with known vehicular sources.

The association of IHD with toxic organic contaminants, specifically benzo[*a*]pyrene (B*a*P) and coronene (Cahill 2010),

TABLE 6
Very fine and ultrafine metals with known vehicular sources

Site	Redding	Chico	Sacramento	Fresno	Bakersfield
Class	Very fine + ultrafine	Very fine + ultrafine	Very fine + ultrafine	Very fine + ultrafine	Very fine + ultrafine
Size	0.26–0 μm	0.26–0 μm	0.26–0 μm	0.26–0 μm	0.26–0 μm
Species					
Phosphorus	1.3	1.0	1.2	4.0	14.5
Iron	6.1	5.7	15.3	10.0	43.2
Nickel	0.9	0.13	0.67	0.35	1.8
Copper	4.2	3.1	2.8	2.9	3.6
Zinc	10.5	15.1	15.4	27.3	24.8

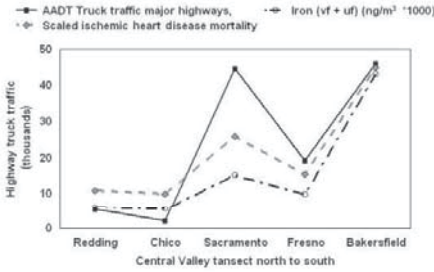


FIG. 14. Association between local average annual daily truck (AADT) traffic on major freeways, scaled ischemic heart disease, and very fine plus ultrafine iron.

was examined but the pattern did not produce a fit to the IHD increase (Figure 15). The relatively high values of B*a*P at Chico in winter, observed for years in prior CARB toxics data reported in the ADAM database (ARB ADAM 2010), was traced to the burning of primarily pine wood.

Coronene is normally associated with the exhaust of automobiles, while B*a*P has known vehicular sources (diesels and cars) as well as wood smoke (Fujita et al. 2007; Riddle et al. 2007; Kleeman et al. 2009; Cahill 2010). The non-soil, nonwood smoke potassium was also observed by Gertler et al. (2003) in the Tuscarora Tunnel studies from light duty vehicles, but not from diesels. Thus, there appears to be a spark emission source of potassium and coronene in the very fine/ultrafine. A south valley enhancement was also seen in petroleum derived alkanes (Cahill 2010), which were present in the largest amounts in Fresno, lesser amounts in Bakersfield, and negligible elsewhere. In summary, it does not appear that organic aerosols from wood smoke, diesels, and automobiles are a component in the IHD excess.

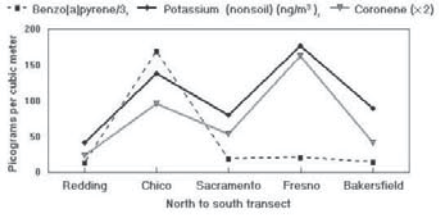


FIG. 15. Comparison of ultrafine B*a*P, potassium, and coronene.

CONCLUSIONS

Persistent enhancement of mortality associated with cardiovascular and specifically IHD has been observed in the southern San Joaquin Valley since 1990, yet while there is a strong statistical association with mass, most of the mass is known to be relatively innocuous to the cardiovascular system. Most of the mass is ammonium nitrate, which is soluble in lung fluid. This makes ammonium nitrate unlikely as a source of cardiovascular disease. In order to examine potential causal agents, a profile was made of mass, inorganic, and organic components of mass in nine size modes, including ultrafines <0.09 μm, at five sites from Redding to Bakersfield during a 3-week period of strong stagnation, January 5–22, 2009. The strongest correaltions to IHD mortality were found in very fine (0.26–0.09 μm) to ultrafine metals, with most tied to vehicular sources. This result is supported by several independent lines of reasoning. First, there is an association with truck traffic and IHD throughout the Valley. Second, the four key transition elements, non-soil iron, nickel, copper, and zinc, are closely tied to vehicular sources through upwind–downwind measurements at Watt Avenue, a secondary artery in suburban Sacramento. Third, the same four elements are found at the downtown ARB 13th and T Street site. Fourth, there are known diesel sources of zinc and phosphorus, from zinc thiophosphate in lubricating oil, plus calcium as an antacid. No iron, nickel, or copper were seen in the diesel dynamometer tests, so these elements are not coming from engine wear. Conversely, brake pads include many elements, including iron, nickel, copper, and zinc. The Watt Avenue data were taken just south of a stoplight, so braking was occurring. Heavy braking also occurs on the I-5 "Grapevine" and Highway 58 downgrades, each more than a 1000 m descent, and both carry heavy truck traffic into Bakersfield, where the same elements are seen again correlating with increased rates of IHD.

Thus, in summary, we present here evidence that, while not conclusive, strongly supports the hypothesis that very fine and ultrafine transition metals are a causal factor in IHD in the Central Valley of California. Removal of zinc thiophosphate from lubricating oil could greatly reduce the zinc concentration, while changes in brake drums and pads could reduce the non-soil iron, copper, zinc, and nickel concentrations in ambient air. After a 15-year fight that surfaced with concerns about the San Francisco Bay, on October 5, 2010, Governor Arnold Schwarzenegger signed SB346, which requires brake pad manufacturers to reduce the use of copper to not more than 5% by 2021 and no more than 0.5% by 2025. The reasons were based on the toxicity of copper in water run-off from roads and follows similar action by Washington State.

Finally, it is clear that the lack of correlation between $PM_{2.5}$ (or $PM_{1.0}$) composition and very fine and ultrafine aerosol composition makes measurements of the composition of very fine and ultrafine particles critical for obtaining causal relations to health impacts, both for organic and inorganic species.

CHAPTER 2
PROJECT DESCRIPTION

This chapter defines existing conditions at the proposed Dorsey Marketplace (proposed project) site and the surrounding areas, summarizes existing and proposed land use and zoning designations for the project site, identifies project objectives, provides a detailed description of two project alternatives, and identifies entitlements and approvals that would be required to implement the project. Figures are provided to facilitate a thorough understanding of the project's regional location, site characteristics, and project alternative components.

As discussed in Chapter 1, Introduction, this Draft Environmental Impact Report (EIR) evaluates two project alternatives at an equal level of detail—one that would develop 90 apartments and approximately 178,960 square feet of commercial space (Alternative A) and one that would develop ~~171~~172 apartments, approximately 104,350 square feet of commercial space, and approximately 8,500 square feet of office space (Alternative B). The description of the two project alternatives included in this chapter sets forth the project characteristics upon which the evaluation of potential impacts in this Draft EIR is based.

2.1 STUDY AREA CHARACTERISTICS

Project Region

The project site is located within the City of Grass Valley (City), in Nevada County, as shown in Figure 2-1, Regional Location. The City encompasses approximately 3,489 acres located along State Route (SR) 49 between Nevada City and the unincorporated community of Alta Sierra. SR 20 is co-located with SR 49 in this location. Census data indicates that the City had a population of 12,860 people in 2010 and the population was projected to reach 12,878 as of 2014 (U.S. Census Bureau 2010). The City's housing stock as of 2010 included 6,637 housing units, with 44% of units being owner-occupied, and the 2010 census identified 5,980 households within the City, with an average of 2.08 persons per household (U.S. Census Bureau 2010).

The City's General Plan notes that in addition to serving the City's residents, the City functions as a "regional economic and cultural center" for as many as 70,000 residents in Nevada County and parts of the three neighboring counties.

The project region is characterized as having varied topography, from nearly flat areas to rolling hills to steep slopes. Land use patterns, road alignments, and economic activity in the region were heavily influenced by the gold rush and the area has supported mining activities intermittently since then.

Project Location

The project site is bordered by SR 20/49 to the west, Dorsey Drive to the north, the Old Barn and Ernie's Storage to the south, and the Grass Valley Terrace Apartments to the east. As shown on Figure 2-2, Project Vicinity Map, the site is located between the SR 20/49 off-ramps for Dorsey Drive and Idaho-Maryland Road. The project would be accessible from Dorsey Drive and from Spring Hill Drive, which accesses Idaho-Maryland Road.

Figure 2-3, Project Site, identifies the 26.8-acre site on an aerial photograph. The site is located at approximately 39°13′41.3″N 121°02′33.8″W. It contains three parcels, designated by Assessor's Parcel Numbers 035-260-062, 035-260-077, and 035-260-064, and the 2.08-acre easement for the planned extension of Spring Hill Drive across the project site.

Prior Uses

The project site was the former location of the Spring Hill Mine, which operated at the site intermittently during the late 1800s and through the 1940s. Abandoned mine features located on site include excavations, pits, remnants of building foundations, stockpiles of mine waste rock, and dry tailings ponds (Appendix H).

Habitats and Vegetation

The project site is characterized as chaparral and coniferous woodland with several developed areas. Five land cover types exist on the project site. The majority of the site consists of whiteleaf manzanita (*Arctostaphylos viscida*) chaparral—this covers 11.10 acres of the site. The site also supports two areas of McNab cypress (*Hesperocyparis macnabiana*) woodland totaling 3.15 acres. The remaining portion of the project site consists of 6.25 acres of ponderosa pine (*Pinus ponderosa*) forest, 0.62 acres of Fremont cottonwood (*Populus fremontii*) woodland, and 5.58 acres of ruderal/developed land. No special-status plants or animals were identified on site; however, the available habitat indicates a low potential for Blainville's horned lizard (*Phrynosoma blainvillii*) and northern goshawk (*Accipiter gentilis*) to be present within the site (Appendix E).

Historic and Archaeological Resources

The natural topography and vegetation within the project site was substantially disturbed as part of operation of the Spring Hill Mine. A records search for the project vicinity completed by the North Central Information Center at California State University Sacramento identified 49 previous studies that have been completed within 1 mile of the project site. Three of these studies covered a least a portion of the project site. These prior studies identified the Spring Hill Mine as a cultural resource. Structures associated with the Spring Hill Mine were once located in the central portion of the site, including the Spring Hill shaft, while grading/clearing activities associated with mine operations

occurred in the western portion of the site. The shaft has been capped with concrete. Several concrete foundations that correspond with the locations of mining features remain on site, but no structures remain on the foundations. The native soils within project site have been substantially disturbed through the site's extended mining history. For this reason there is a very low potential for intact prehistoric cultural resources to be present (Appendix F). However, as discussed further in Chapter 7, Cultural Resources, in consideration of this history, there is a potential that this past mining activity resulted in the deposition of historical deposits and/or features.

Geology and Soils

The site is located in the Sierra Nevada foothills and is within the Foothills Fault System. According to a geological survey conducted in 1996, the Bear Mountain Fault line runs approximately 1 kilometer (0.6 miles) south of the project site. The Nevada City Special Folio identified a quartz vein that runs directly through the center of the project site, which was most likely the resource being sought by the Spring Hill Mining Operation (Appendix J).

As documented in the Geotechnical Report prepared for the project site by Holdrege & Kull (Appendix J):

> surface topography at the site generally slopes toward the south and southwest from a relatively flat-lying area in the northern portion of the site and a knoll in the north central portion of the site. The site elevation ranges from approximately 2550 feet above mean sea level (MSL) in the southwestern portion of the site to approximately 2690 feet above MSL in the northern portion of the site. The site is generally vegetated by pine, manzanita, oak, and cottonwood trees in the southwestern portion of the site. Rock outcrop is present at several locations in the western, northern and eastern portions of the property [Appendix J].

The native topsoil at the project site consists of clay, gravelly clay, and sandy clay. Beneath the clay layer is the bedrock, consisting of diabase and serpentine rock. In the trenches that appear on the site, the diabase and serpentine rocks are moderately to severely weathered. In these trenches, the clay layer over the serpentine and diabase was 2.5 feet thick. As noted in the Removal Action Workplan (RAW) for the site, the Dubakella complex dominated the majority of the site's soil conditions. The site is a part of the ultramafic–mafic "basement" of the Lake Combie complex (Appendix J).

According to the U.S. Department of Agriculture Natural Resources Conservation Service (USDA 2016), the three soil types mapped within the site include Placer diggings; rock outcrop–Dubakella complex, 5%–50% slopes; and Sites loam, 9%–15% slopes. Placer diggings are generally found where historic mining practices have altered the land. Placer diggings consist of numerous minor components. Rock outcrops–Dubakella complex soils consist of ultrabasic rock outcrops in

Dubakella soils on hills and mountains. These are rocky, well-drained soils that often contain serpentinite components. Sites loams consist of well-drained clay loams derived from metabasic residuum weathered from metasedimentary rock (USDA 2016).

Hydrology and Drainage

The project site is located in the Upper Bear hydrologic unit (HUC 18020126). Aquatic features within the site include numerous erosional channels and one depression at the southwestern end of the project site. Based on historical aerial photography and visual inspection during the site survey, these features are only periodically inundated and tend to remain inundated for short periods, depending on the frequency and duration of rainfall events (Appendix E).

Drainage on the project site generally flows from north to south. Stormwater runoff from the site discharges in two main locations: an existing 24-inch pipe that carries runoff to the west and south, generally along the route of SR 20/49, and a rock-lined swale that carries runoff to the east and south (Appendix K).

Hazardous Materials

The Geotechnical Report notes that the map of the Spring Hill Mine depicts buildings, mine shafts, tailing piles, and waste dumps composing the western and central portion of the property (Appendix J).

The property is a brownfield site as defined under the U.S. Environmental Protection Agency's Brownfields Program. Specifically, reuse of the project site "may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant" associated with the prior mining activities on site. Further, the project site has been designated "an area of concern with regard to hazardous waste contamination" by the City of Grass Valley Redevelopment expansion feasibility study. Due to the site's history as a mining site, the site contains arsenic, lead, and mercury associated with mining activity detected in the old tailing ponds (Appendix J). The property owner has prepared a Remedial Action Workplan (RAW) to document the presence of hazardous materials within the project site, the areas where soil will be excavated and disposed of offsite, and the areas where soil will be covered with clean fill to prevent release of hazardous materials after project construction is complete. The RAW has been approved by the California Department of Toxic Substances Control (Appendix J).

The Geotechnical Report notes that the project site is located within the Foothills Fault System, which is "designated as a Type C fault zone, with low seismicity and a low rate of recurrence" and that the site is not located within an Alquist-Priolo active fault zone (Appendix J).

Additionally, areas of the site could contain naturally occurring asbestos, which could pose health hazards if it is disturbed during or following construction. Refer to Chapter 10, Air Quality, and Chapter 15, Hazards and Hazardous Materials, for additional discussion of the potential for release of naturally occurring asbestos and associated mitigation measures to avoid associated adverse health effects.

Adjacent Land Uses

SR 20/49 runs parallel to the project site along the site's western boundary. There are three self-storage facilities to the south (Old Barn, Ernie's, and Springhill), as well as Bub Enterprises Inc. To the southeast, there is Gold Country Gymnasium and Warm's Yoga. To the north of this and east of the project site, separated by open space, are the Grass Valley Terrace Apartments. To the north of the proposed project, on the other side of Dorsey Drive, are the Springhill Garden Apartments. Additionally, across SR 20/49 there are sensitive populations in the Golden Empire Nursing and Rehab Center and the Sierra Nevada Memorial Hospital.

2.2 GENERAL PLAN AND ZONING DESIGNATIONS

Project Site

The project site is currently designated under the General Plan as Business Park and zoned Corporate Business Park.

Under either Alternative A or Alternative B, the project would require a General Plan Amendment and rezone to change land currently designated for Business Park to Commercial and Residential Urban High Density and a rezone from Corporate Business Park to Commercial (C-2) and Multiple Dwelling Residential (R-3). Chapter 3, Land Use, of this EIR evaluates the proposed project's consistency with applicable 2020 General Plan policies and zoning requirements, consistency with other relevant City planning documents, and compatibility with adjacent land uses.

Adjacent Parcels

The SR 20/49 right-of-way borders the site on the west. Properties west of the highway are designated Institutional/Non-Governmental and Office/Professional. Properties to the north and east of the project site support apartment complexes and a mobile home community; these areas are designated for residential land uses as Urban Medium Density under the General Plan. Properties to the south of the project site are designated Manufacturing/Industrial.

2.3 PROJECT OBJECTIVES

The project applicant has set forth the following objectives for the proposed Dorsey Marketplace project:

- Create a high-quality mixed-use infill project combining residential, retail, and community uses through the re-use of an existing brownfield site consistent with the City's plans for the Core Priority Development Area and its Economic Strategic Plan.
- Develop an infill site adjoining and proximate to existing infrastructure, high density residential, affordable and senior housing, Sierra Nevada Memorial Hospital and medical offices, and existing businesses along Idaho-Maryland Road.
- Construct the Spring Hill Drive connector between Dorsey Drive and Idaho Maryland Road, consistent with the City's General Plan.
- Incorporate safe and convenient walking paths, access to public transit, enhanced bicycle circulation.
- Redevelop the property to allow for the environmental clean-up of a brownfield former mining site.
- Develop the project site in such a way as to make a positive contribution to the City's satisfaction of its Regional Housing Needs Allocation through the creation of new quality high-density market-rate housing.
- Create new retail uses that will capture more local sales tax dollars, reducing the amount of sales tax leakage from City and County residents shopping in other jurisdictions, and reducing vehicle miles traveled, air quality impacts and greenhouse gas emissions associated with shopping destinations outside the area.
- Develop a retail mixed use center that incorporates quality design, local art and community amenities that delivers a lifestyle oriented experience.
- Develop a diverse mix of retail uses that allows a single vehicle trip to the project site verses multiple vehicle trips to a number of retail locations to enjoy a similar shopping experience, thereby reducing vehicle miles traveled, air quality impacts and greenhouse gas emissions.
- Develop a mixed-use project that includes high-density residential uses to reduce the need for vehicular trips to satisfy resident retail needs.

2.4 DESCRIPTION OF PROJECT ALTERNATIVE A

Alternative A would accommodate development of approximately 178,960 square feet of commercial land uses and 90 residential apartments, as shown in Figure 2-4, Alternative A Site Plan.

Land Use

Alternative A would require a General Plan Amendment and rezone to change the land use designation on the site from Business Park (26.8 acres) to Commercial (21 acres) and Residential Urban High Density (5.8 acres). This alternative would also require a rezone from Corporate Business Park to Commercial (C-2) and Multiple Dwelling Residential (R-3). The existing and proposed General Plan and zoning designations are discussed further in Chapter 3.

The Alternative A site plan shows a total of 178,960 square feet for commercial uses. This component of the project includes four major shops (with sizes ranging between 20,000 and 40,000 square feet), six smaller shops (with sizes between 4,000 and 8,560 square feet), three pads for drive-through services such as ~~fast-food~~ restaurants and financial institutions (sizes between 3,300 and 4,100 square feet) and one 6,000-sqare-foot pad that would support food service without a drive-through. The six smaller shops are proposed in the northern and eastern portions of the site, with three of the four major shops proposed for the southwestern portion and one major shop for the northern portion. The four pads would generally be located in the northeastern portion of the site near the project site entrance on Dorsey Drive. Parking would be placed in the central and western portions of the site and bus shelters would be provided on both sides of the central drive adjacent to Shop E.

The dwelling units would be offered as market-rate rental units and are expected to include 50 two-bedroom units and 20 each of the one- and three-bedroom layouts. The units would range in size from 1,013 to 1,600 square feet. They would be constructed as two-story and three-story buildings in the southeastern corner of the project site. This area would also include an apartment clubhouse and pool and tot lot park area. A small dog park is also proposed along the eastern site boundary, south of proposed Pad 4.

Circulation

Vehicular access to the site would come from Dorsey Drive on the north and Spring Hill Drive on the south. Vehicles would circulate through the project site using the central spine road, which would provide access to the various parking areas on site. The central spine road would include striped bicycle lanes on each side of the street and bus shelters near Shop E.

Pedestrian plazas would be created at the front of all of the shop areas, connected by wide, landscaped walkways that cross the parking area. A total of 927 parking spaces are proposed under Alternative A, including 746 for the commercial area and 180 for the residential area. The project would also provide racks throughout the site to accommodate 72 bicycles. In the commercial parking area, the project would include preferential parking for low emission vehicles and provide electric vehicle charging ~~stations~~ supply infrastructure equal to 6% of the total number of parking

spaces~~d~~, consistent with the California Green Energy Code requirements. Of the residential parking spaces, 94 would be in covered parking stalls, and the remaining 86 would be uncovered.

Hazards and Hazardous Materials Remediation

Due to the prior mining activities on site, there are quite a few constituents of potential concern that could negatively affect human and environmental health if levels are too high. Under either alternative, the project would include implementation of the RAW that has been approved by the California Department of Toxic Substances Control. The constituents of potential concern at this site include arsenic, lead, antimony, copper, mercury, vanadium, and naturally occurring asbestos. There are three areas of concern (AOCs) on the Spring Hill site, two of which are listed as areas for remediation. AOC 1, the former mill area, contains highest levels of arsenic and lead contamination. The RAW dictates that 1,700 cubic yards, or 150 truckloads, of contaminated soil and mine waste should be removed. AOC 2, the remaining mine waste area located west of the former mill site, contains levels of contamination that exceed the maximum public health levels but are less than those of AOC 1. Therefore, the RAW determined that it would be appropriate to bury this AOC and use the site improvements to cap the contaminants on site. There is about 64,000 yards of contaminated soil and mine waste to be buried—covered with 10 feet of clean soil and then capped with either the foundations of a building or a parking lot. Additionally, there would be restrictions on land use in order to ensure that the contaminated soil is not disturbed (Appendix J).

Drainage and Grading

Following implementation of the RAW, additional grading would be necessary to implement the proposed project. Excluding the soil removal as a part of the hazard remediation plan, it is expected that the cut and fill would balance and no soil import or export would be necessary. The Alternative A site plan shows that up to 40 feet of cut is proposed in the central portion of the property and up to 60 feet of fill in the southwestern portion of the property. Several rock retaining walls would be constructed in various locations around the site perimeter, with the longest wall being placed near the southern site boundary west of Springhill Drive.

Because the site is in an area of naturally occurring asbestos, the Northern Sierra Air Quality Management District would require preparation and implementation of an Asbestos Dust Mitigation Plan for either alternative, under the Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operation, which is monitored by the California Environmental Protection Agency's Air Resources Board Regulation 93105. Refer to Chapter 15 for additional discussion of the potential for release of naturally occurring asbestos during grading.

The project would incorporate Low Impact Development (LID) measures to protect water quality and reduce stormwater runoff. This would include construction of stormwater collection and detention features within the site, such as grassy swales, detention basins, detached downspouts, and landscape strips, as discussed in Chapter 13, Hydrology and Water Quality, and shown in the site plan. Stormwater would be routed through pipes and drainage swales towards the southern site boundary where it would exit the site near the Old Barn Self Storage through an existing concrete weir and into an existing below-grade storm drain pipe.

Public Spaces and Amenities

Recreational amenities included as part of the apartment complex in the Alternative A include a 3,260-square-foot clubhouse with a fitness center and community meeting room and pool as well as a tot lot park area. Proposed public facilities include a dog park along the eastern property boundary and pedestrian plazas north of Shops C, D, and E and southeast of Shop A. These plazas are proposed to include outdoor seating and feature local art and history exhibits.

Easements

There is an existing offer of dedication for the planned alignment of Spring Hill Drive through the project site, consistent with the City of Grass Valley General Plan. This offer would be abandoned and replaced with the proposed alignment of Spring Hill Drive.

Project Phasing

Construction of the residential and non-residential space within the project site would occur based on market demands. It is expected that all site preparation and grading would occur in a single season and while building pads and individual structures may be constructed over a period of a few years. However, for the purposes of the impact analysis, the project is assumed to be constructed in a single construction phase. Initial activities would include site preparation (removing vegetation and installing water quality protection measures) and rough grading. The rough grading would require approximately 16 weeks to implement the RAW and prepare the site for building construction. Installation of wet utilities, storm drainage infrastructure, and dry utilities would begin midway through the rough grading phase and end approximately 4 weeks after rough grading is complete. This would be followed by approximately 3 weeks of final grading, 4 weeks of laying base rock, and 2 weeks of paving. Building construction is expected to occur over approximately 26 weeks and architectural coatings would be applied over a period of 5 weeks.

Off-Site Improvements

The Traffic Impact Analysis prepared for the project (Appendix G) found that the Alternative A would result in significant impacts to several off-site intersections. As discussed in Chapter 8, Transportation, the project would be required to contribute fair-share funding for improvements at several of these intersections, stripe a new right-turn lane within the existing pavement at one intersection, and construct the off-site improvements consisting of installation of traffic signals at the intersections of Idaho-Maryland Road at the SR 20/49 northbound on ramps, Dorsey Drive at Catherine Lane, Dorsey Drive at Sutton Way, and Bennett Street and SR 20/49 southbound off ramps/Tinloy Street.

Based on the analysis of the future wastewater flows in the City's wastewater collection system (Appendix K), the project would contribute to the need to upsize one of the existing 18-inch twin sewer lines that pass under SR 20/49 to 24 inches or to add a third line. The need for increasing the capacity in this portion of the City's sewage infrastructure is identified in the City's Wastewater System Master Plan (City of Grass Valley 2016). As discussed further in Chapter 14, Public Services and Utilities, the proposed project would be required to contribute a fair-share amount to this future wastewater system capacity increase but would not be required to construct any off-site wastewater system improvements.

Utilities

Provision of utility services for Dorsey Marketplace would be the same under each alternative. The City would provide sewage conveyance and treatment, water supply, and stormwater drainage, while gas and electric service would be provided by Pacific Gas & Electric.

2.5 DESCRIPTION OF PROJECT ALTERANTIVE B

Alternative B, shown in Figure 2-5, Alternative B Site Plan, relies on essentially the same footprint as the Alternative A, but reduces the amount of retail and commercial uses, increases the number of residential units and adds an office space component. Described as follows, Alternative B would accommodate development of approximately ~~171~~172 residential apartments 104,350 square feet of commercial land uses, and 8,500 square feet of office space.

Land Use

Alternative B would require a General Plan Amendment and rezone to change the land use designation on the site from Business Park (26.8 acres) to Commercial (14.5 acres) and Residential Urban High Density (12.3 acres). It would also require a rezone from Corporate Business Park to 14.5 acres of Commercial (C-2) and 12.3 acres of Multiple Dwelling Residential (R-3). The existing and proposed General Plan and zoning designations are discussed further in Chapter 3.

The Alternative B site plan shows a total of 104,350 square feet for commercial uses with two major shops (35,000 and 21,500 square feet), five smaller shops (with sizes between 4,000 and 8,500 square feet), three pads for drive-through services such as ~~fast-food~~restaurants and financial institutions (sizes between 3,200 and 4,200 square feet) and one 6,000-sqare-foot pad that would support food service without a drive-through. The two major shops and two of the five small shops are proposed in the northwestern portion of the site adjacent to the SR 20/49 off-ramp. The other three small shops would be located in the eastern portion of the site adjacent to the central spine road. As in Alternative A, the four pads would generally be located in the northeastern portion of the site near the project site entrance on Dorsey Drive. Parking would be placed in the central and western portions of the site and bus shelters would be provided on both sides of the central drive adjacent to Shop E.

This alternative would construct ~~171~~172 residential apartments that would be offered as market-rate rental units and are expected to include ~~95~~96 two-bedroom units and 38 each of the one- and three-bedroom layouts. The units would range in size from 1,013 to 1,600 square feet. They would be constructed as two-story and three-story buildings in the southern portion of the project site. One of the buildings would include approximately 50% apartment space and 50% office space, providing 8,500 square feet of office space near the center of the project site.

As in Alternative A, Alternative B would also include an apartment clubhouse and pool and tot lot park area. A small dog park is also proposed along the eastern site boundary, south of proposed Pad 4.

Circulation

The provisions for vehicular access to and across the site would be the same as under the Commercial/Residential Alternative. Vehicles would circulate through the project site using the central spine road, which would provide access to the various parking areas on site and would connect to Dorsey Drive on the north and Spring Hill Drive on the south. The central spine road would include striped bicycle lanes on each side of the street and bus shelters near Shop E.

Pedestrian plazas would be created at the front of all of the shop areas, connected by wide, landscaped walkways that cross the parking area. A total of 962 parking spaces are proposed under the Commercial/Residential Alternative, including 538 for the commercial area, 29 for the office area, and 395 for the residential area. The project would also provide racks throughout the site to accommodate 57 bicycles. In the commercial parking area, the project would include preferential parking for low emission vehicles and electric-vehicle charging ~~stations~~supply infrastructure. Of the residential parking spaces, 304 would be in covered parking stalls, and the remaining 74 would be uncovered.

Hazards and Hazardous Materials Remediation

Alternative B would include implementation of the RAW that has been approved by the California Department of Toxic Substances Control to remediate potential health hazards associated with the presence of arsenic, lead, antimony, copper, mercury, vanadium, and naturally occurring asbestos at the project site. Refer to previous Section 2.4 and Chapter 15 for more details.

Drainage and Grading

Alternative B would also require substantial grading to implement the project. Site grading and placement of retaining walls would be similar under both alternatives. Additionally, Section 2.4 discusses the need for preparation and implementation of an Asbestos Dust Mitigation Plan for either alternative. This is discussed in more detail in Chapter 15. Further, as noted in Section 2.4 and discussed in Chapter 13 under either alternative, the project would incorporate LID measures to protect water quality and reduce stormwater runoff. Stormwater drainage would be handled similarly under both alternatives, with the use of vegetated swales and below-grade stormwater drainage pipes conveying drainage to an existing stormwater drain along the southern boundary of the site.

Public Spaces and Amenities

Recreational amenities included as part of the apartment complex in Alternative B include a 3,260-square-foot clubhouse with a fitness center and community meeting room and pool as well as a tot lot park area. Proposed public facilities include a dog park along the eastern property boundary and pedestrian plazas surrounding Shops C, D, and E and in front of the two major shops and two smaller shops in the northern portion of the site. These plazas are proposed to include outdoor seating and feature local art and history exhibits.

Easements

The existing offer of dedication for Spring Hill Drive through the project site would be abandoned and replaced with the proposed alignment of Spring Hill Drive.

Project Phasing

Construction of Alternative B would require a similar schedule as Alternative A, beginning with site preparation and rough grading; installation of wet utilities, storm drainage infrastructure, and dry utilities; final grading; laying base rock; and paving.

Off-Site Improvements

The Traffic Impact Analysis prepared for the project (Appendix G) found that Alternative B would result in significant impacts to off-site intersections. As discussed in Chapter 8, the project would be required to contribute fair-share funding to installation of a traffic signal, but would not be required to construct any off-site improvements.

Based on the analysis of the future wastewater flows in the City's wastewater collection system (Appendix K), the project would contribute to the need to upsize one of the existing 18-inch twin sewer lines that pass under SR 20/49 to 24 inches or to add a third line. The need for increasing the capacity in this portion of the City's sewage infrastructure is identified in the City's Wastewater System Master Plan (City of Grass Valley 2016). As discussed further in Chapter 14, the proposed project would be required to contribute a fair-share amount to this future wastewater system capacity increase but would not be required to construct any off-site wastewater system improvements.

Utilities

Provision of utility services for Dorsey Marketplace would be the same under each alternative. The City would provide sewage conveyance and treatment, water supply, and stormwater drainage, while gas and electric service would be provided by Pacific Gas & Electric.

2.6 PROJECT ALTERANTIVE SUMMARY COMPARISON

Table 2-1 compares the individual components of the two project alternatives.

Table 2-1
Summary of Project Components in Alternatives A and B

Project Component	Alternative A: Commercial/Residential	Alternative B: Commercial/Office/Residential
Commercial/Retail	4 Major Shops • 20,000–40,000 sf 6 smaller shops • 4,000–8,560 sf 4 pads • 3,300–6,000 sf	2 Major Shops • 21,500–35,000 sf 5 smaller shops • 4,000–8,500 sf 4 pads • 3,200 – 6,000 sf
Office	0	8,500 sf
Residential	20 one-bedroom units 50 two-bedroom units 20 three-bedroom units	38 one-bedroom units ~~95~~96 two-bedroom units 38 three-bedroom units
Clubhouse	3,260 sf	3,260 sf
Other private recreation (for apartments)	Tot-lot Pool	Tot-lot Pool

Table 2-1
Summary of Project Components in Alternatives A and B

Project Component	Alternative A: Commercial/Residential	Alternative B: Commercial/Office/Residential
Public recreation	Dog park	Dog park
Parking	746 retail/commercial 180 residential	538 retail/commercial 395 residential 29 office
Bicycle parking	72	57
Total sf/units	**178,960-sf retail/commercial** **90 dwelling units**	**104,350-sf retail/commercial** **8,500-sf office** **~~171~~172 dwelling units**

Note: sf = square feet

2.7 ENTITLEMENTS AND REQUIRED APPROVALS

To authorize the proposed project under either Alternative A or Alternative B to proceed, the City would need to grant the following entitlements:

- General Plan Amendment to change the land use designation from Business Park to Commercial and Urban High Density Residential
- Rezoning from current zoning of Commercial Business Park to Central Business District (C-2) and Multiple Dwelling Residential (R-3)
- Development Review Permit for the mixed-use project
- Use permit for the ~~restaurants~~ facilities with drive-through service
- Lot Line Adjustment

In addition, the project would also require the following approvals. The applicable agencies may rely on this EIR in considering whether to grant the requested approvals.

- The California Department of Transportation (Caltrans) would be requested to issue an encroachment permit to authorize construction of improvements within the Caltrans right-of-way.
- Impacts to the seasonal wetland and intermittent drainage in the southern portion of the project site would require authorization from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act, water quality certification from the Central Valley Regional Water Quality Control Board under section 401 of the Clean Water Act, and a streambed alteration agreement from the California Department of Fish and Wildlife.

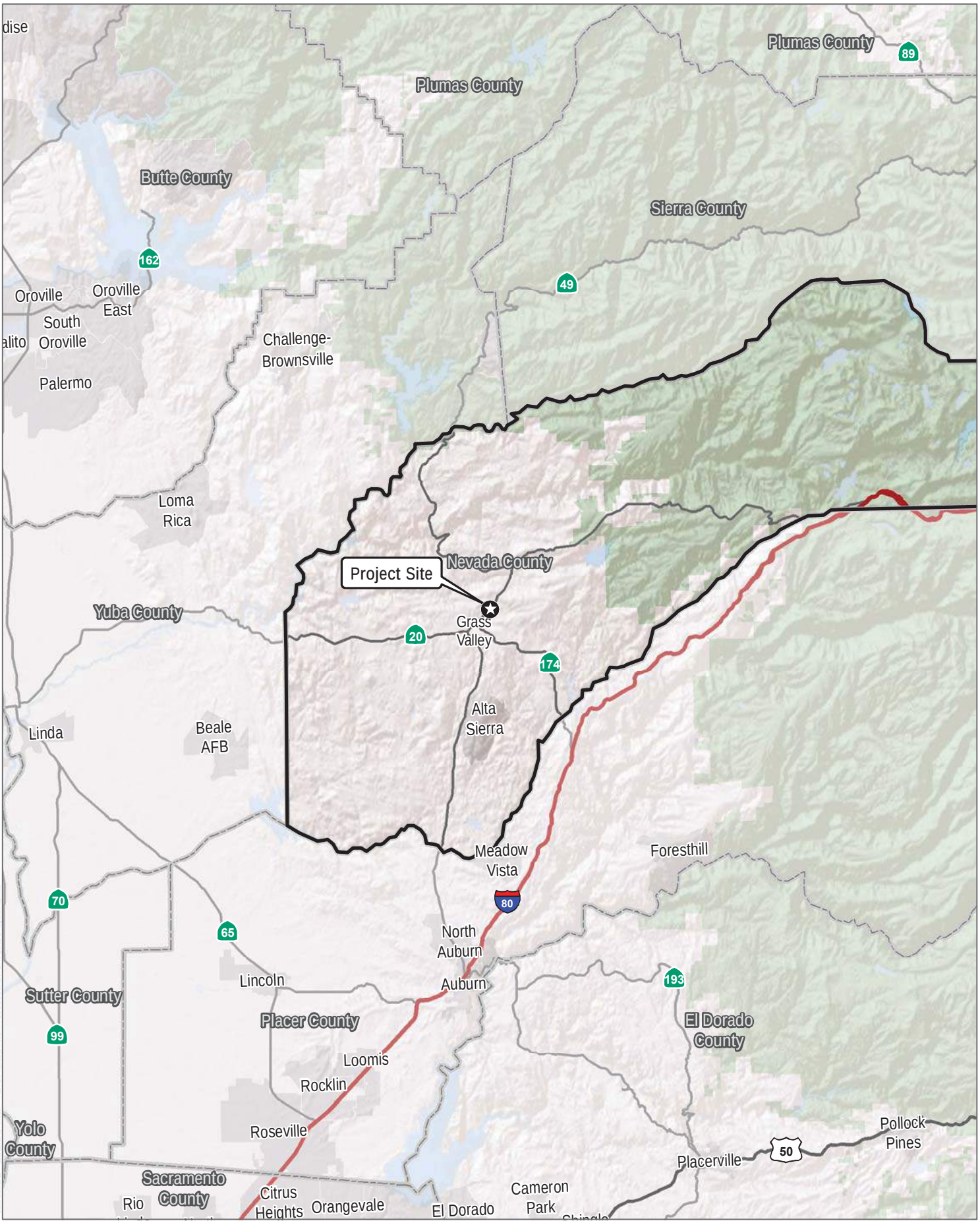
- Northern Sierra Air Quality Management District would be requested to issue an Authority to Construct and a Permit to Operate for any on-site business that would install a stationary source of air pollution, such as typical commercial kitchen equipment.

2.8 REFERENCES CITED

City of Grass Valley. 2016. *Wastewater System Master Plan*. Prepared by Stantec on behalf of the City of Grass Valley. August 23, 2016.

U.S. Census Bureau. 2010. "Quick Facts: Grass Valley City, California." http://www.census.gov/quickfacts/table/PST045215/0630798,06.

USDA (U.S. Department of Agriculture). 2016. Web Soil Survey. USDA Natural Resources Conservation Service, Soil Survey Staff. http://websoilsurvey.nrcs.usda.gov/.



SOURCE: ESRI 2018

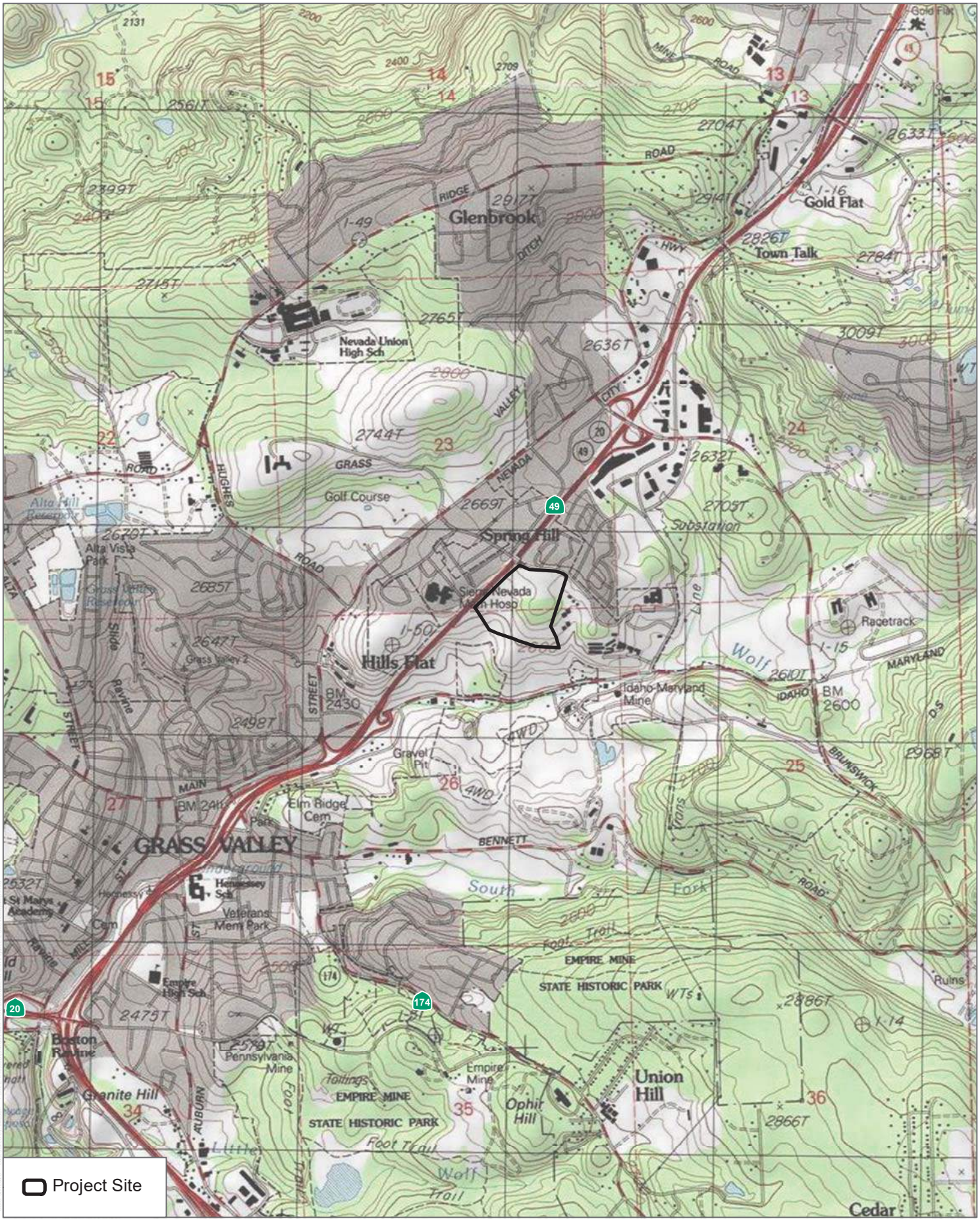
DUDEK

0 21,000 42,000 Feet

FIGURE 2-1

Regiona Location

Dorsey Marketplace EIR



SOURCE: USGS Topo 7.5-Minute Grass Valley Quadrangle.

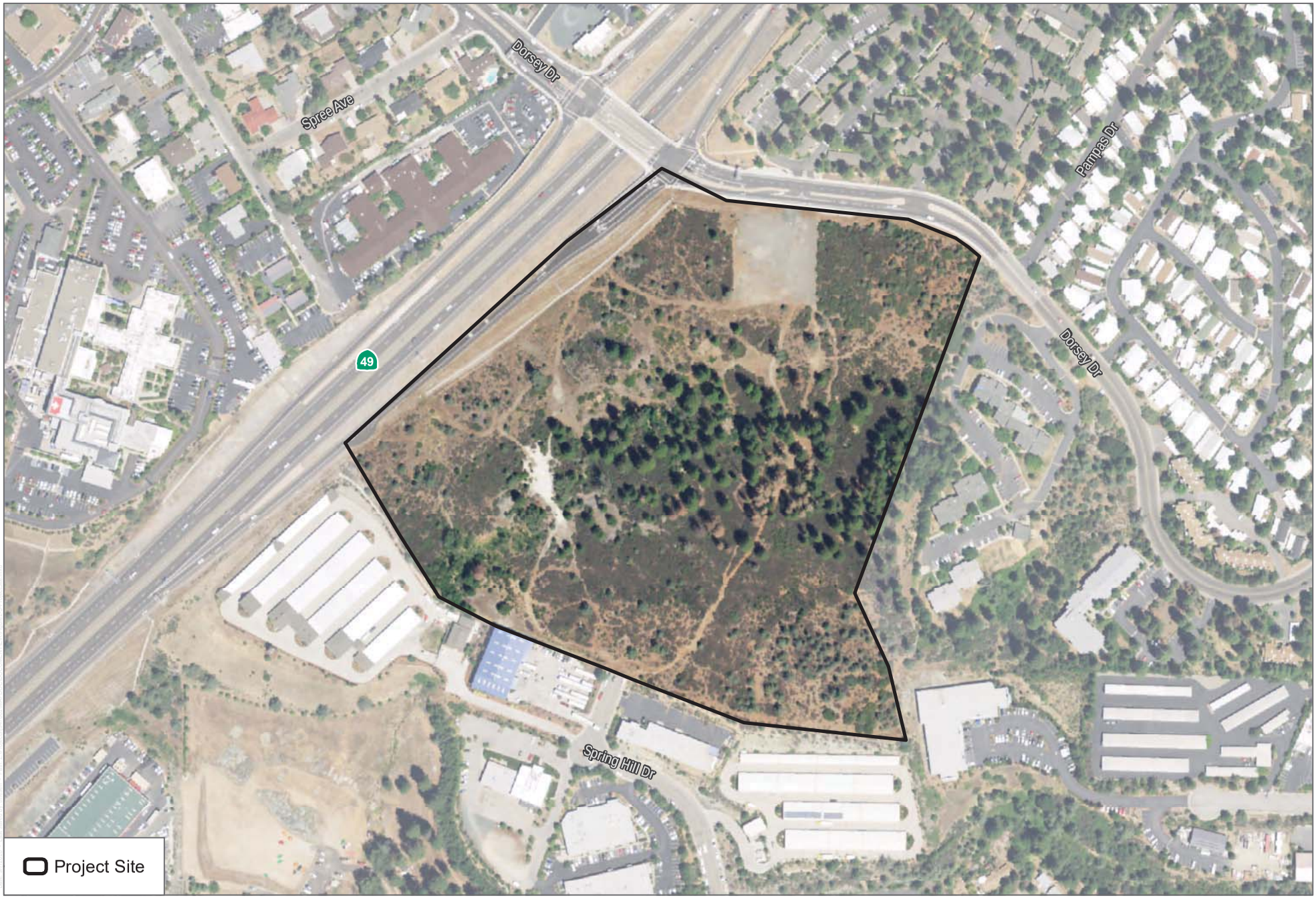
DUDEK

0 1,000 2,000 Feet

FIGURE 2-2

Project Vicinity

Dorsey Marketplace EIR



SOURCE: USDA 2016

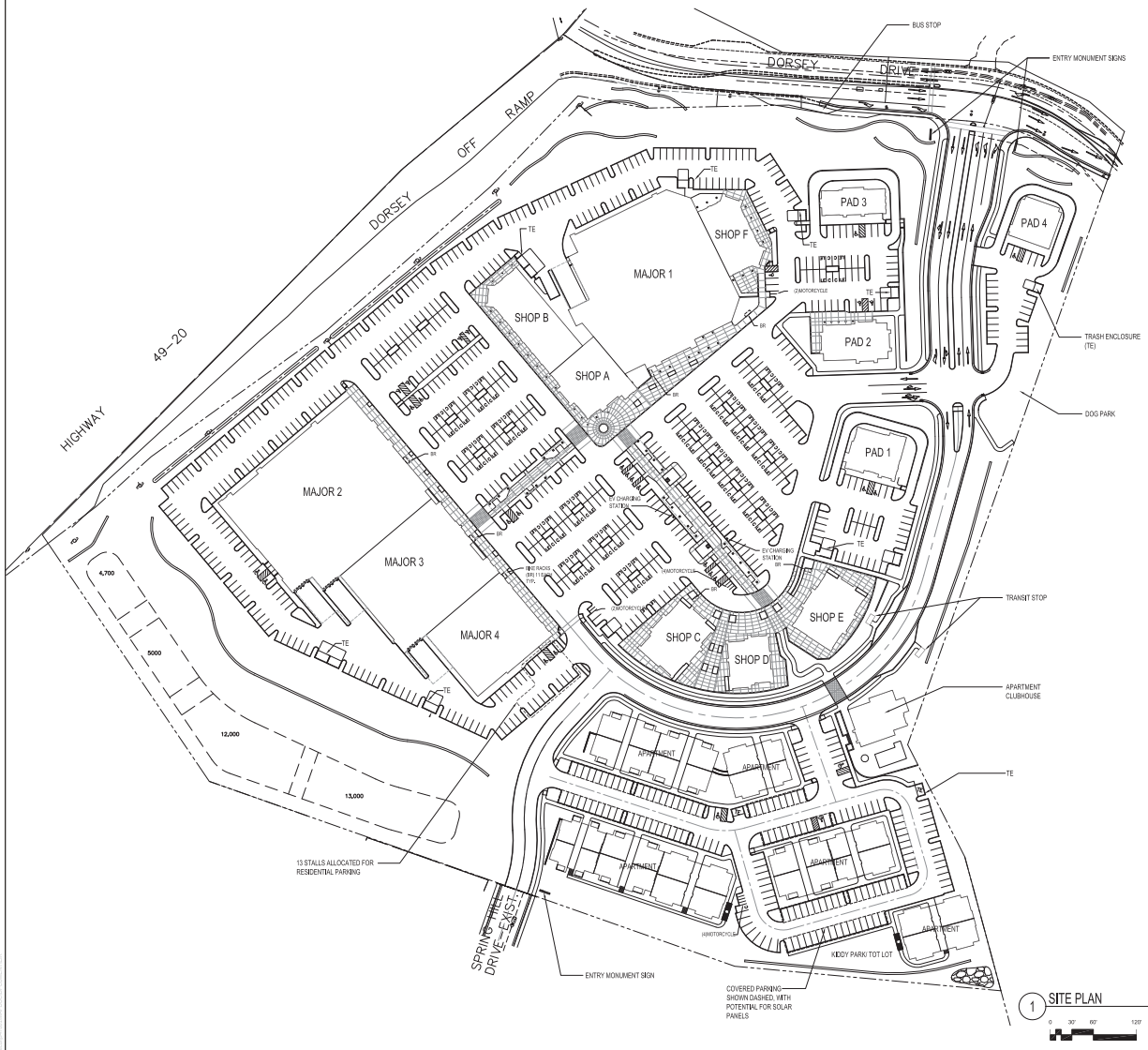
DUDEK

0 150 300 Feet

FIGURE 2-3

Project Site

Dorsey Marketplace EIR



BUILDING AREA DATA:

RETAIL / COMMERCIAL

MAJOR 1	40,000 SF
MAJOR 2	38,000 SF
MAJOR 3	25,000 SF
MAJOR 4	20,000 SF
SHOP A	7,600 SF
SHOP B	8,560 SF
SHOP C	6,400 SF
SHOP D	4,000 SF
SHOP E	6,400 SF
SHOP F	6,100 SF
PAD 1	4,100 SF
PAD 2	6,000 SF
PAD 3	3,300 SF
PAD 4	3,500 SF
TOTAL RETAIL / COMMERCIAL AREA:	178,960 SF
AREA OF APARTMENT CLUBHOUSE:	3,260 SF + -

RESIDENTIAL

3 BEDROOM APARTMENTS: (1600SF +- PER UNIT)	20 UNITS
2 BEDROOM APARTMENTS: (1340 SF +- PER UNIT)	50 UNITS
1 BEDROOM APARTMENTS: (1013 SF +- PER UNIT)	20 UNITS
TOTAL NUMBER OF APARTMENTS	90 UNITS

PARKING DATA:

RETAIL / COMMERCIAL

REQUIRED PARKING COMMERCIAL BEFORE BICYCLE SUBSTITUTION (4/1000) :	716 STALLS
** REQUIRED PARKING COMMERCIAL AFTER BICYCLE SUBSTITUTION :	707 STALLS
***REQUIRED PARKING COMMERCIAL AFTER MOTORCYCLE SUBSTITUTION :	704 STALLS
REQUIRED ACCESSIBLE PARKING	18 STALLS
PARKING PROVIDED COMMERCIAL:	746
- STANDARD STALLS PROVIDED:	632 STALLS
- COMPACT STALLS PROVIDED:	81 STALLS 11% < 20% ALLOWED, THUS OK)
- ACCESSIBLE PARKING (2% OF TOTAL REQ.):	26 STALLS (REQUIRED IS 2% OF TOTAL = 15 STALLS) 26 STALLS > 15 STALLS, THUS OK)
- MOTORCYCLE ***	8 SPACES
- LOW EMITTING VEHICLES : (AS REQUIRED BY CAL GREEN STRIPED AND INDICATED ON SITE PLAN AS 'LE', PART OF TOTAL STANDARD STALLS)	74 STALLS

RESIDENTIAL

PROVIDED PARKING RESIDENTIAL (2 STALLS/UNIT)	
- STANDARD STALLS PROVIDED:	168 STALLS
- COMPACT STALLS PROVIDED:	1 STALL
- ACCESSIBLE PARKING PROVIDED:	7 STALLS (REQUIRED IS 2% OF TOTAL = 4 STALLS)
- MOTORCYCLE (167 STALLS IMMEDIATELY ADJACENT TO APARTMENT BUILDINGS . 13 STALLS ARE LOCATED ON SOUTH SIDE OF MAJOR 4, SEE SITE PLAN FOR LOCATION	4 SPACES
APARTMENT CLUBHOUSE	0 STALLS (AMENITY TO APARTMENTS)
TOTAL PARKING PROVIDED ON SITE:	927 STALLS

OTHER PARKING:

BICYCLE RACKS: (10% OF 716 STALLS)	72 RACKS
** SUBSTITUTION FOR AUTOMOBILE PARKING IS (1) STALL PER 8 BICYCLE RACKS, UP TO 10% MAXIMUM OF REQUIRED VEHICLE SPACES	** 716 X 10% = 72 / 8 = 9 STALL REDUCTION
MOTORCYCLE SPACES ALLOWED:	$\frac{1}{25}$, UP TO 10% MAX. OF REQUIRED VEHICLES
***SUBSTITUTION FOR AUTOMOBILE PARKING IS (1) SPACE PER 25 AUTO SPACES, UP TO 10% MAXIMUM OF REQUIRED VEHICLE SPACE	***716 X 10% = 72 SPACES 72 / 25 = 3 SPACE REDUCTION (12 MOTORCYCLE SPACES PROVIDED , 72 ALLOWED, THUS "OK")

SOURCE: Williams + Paddon 2017

FIGURE 2-4

Alternative A Site Plan

Dorsey Marketplace EIR

DUDEK

BUILDING AREA DATA:

RETAIL / COMMERCIAL AREA:	
MAJOR 1	21,500 SF
MAJOR 2	35,000 SF
SHOP A	8,500 SF
SHOP B	5,650 SF
SHOP C	6,400 SF
SHOP D	4,000 SF
SHOP E	6,400 SF
PAD 1	4,200 SF
PAD 2	6,000 SF
PAD 3	3,200 SF
PAD 4	3,500 SF
TOTAL RETAIL / COMMERCIAL AREA:	104,350 SF
TOTAL OFFICE AREA:	8,500 SF
AREA OF APARTMENT CLUBHOUSE:	3,260 SF +-
RESIDENTIAL	
3 BEDROOM APARTMENTS: (1600SF +- PER UNIT)	38 UNITS
2 BEDROOM APARTMENTS: (1340 SF +- PER UNIT)	95 UNITS
1 BEDROOM APARTMENTS: (1013 SF +- PER UNIT)	38 UNITS
TOTAL NUMBER OF APARTMENTS	171 UNITS

PARKING DATA:

PARKING REQUIRED :	
REQUIRED PARKING COMMERCIAL BEFORE BICYCLE SUBSTITUTION (4/1000) :	417 STALLS
** REQUIRED PARKING COMMERCIAL AFTER BICYCLE SUBSTITUTION :	412 STALLS
***REQUIRED PARKING COMMERCIAL AFTER MOTORCYCLE SUBSTITUTION :	410 STALLS
REQUIRED ACCESSIBLE PARKING (2% OF TOTAL PARKING PROVIDED)	12 STALLS
REQUIRED BIKE PARKING (10% OF TOTAL PARKING PROVIDED)	0.1 * 568 = 57 BIKE RACKS
REQ. CLEAN AIR / VAN POOL / EV : (AS REQUIRED BY CAL GREEN)	0.08 * 568 = 46 STALLS
REQ. FUTURE ELECTRIC VEHICLE CHARGING STATION: (AS REQ. BY CAL GREEN)	0.06 * 568 = 35 STALLS
REQUIRED OFFICE PARKING (1:400)	22 STALLS

RETAIL / COMMERCIAL PARKING PROVIDED :	
- STANDARD STALLS PROVIDED:	447 STALLS
- COMPACT STALLS PROVIDED:	77 STALLS (13% < 20% ALLOWED, THUS OK)
- ACCESSIBLE PARKING:	14 STALLS (12 > 15 STALLS, THUS OK)
- MOTORCYCLE ***	5 SPACES
- BIKE RACKS	57 BIKE RACKS
- CLEAN AIR / VAN POOL / EV : (STRIPED AND INDICATED ON SITE PLAN AS 'LE', PART OF TOTAL STANDARD STALLS)	46 STALLS
- FUTURE ELECTRIC VEHICLE CHARGING: (INDICATED ON SITE PLAN AS 'EV' PART OF 'LE' STALL COUNT)	35 STALLS

RESIDENTIAL PARKING PROVIDED:	
- STANDARD STALLS (COVERED) PROVIDED:	304 STALLS
- STANDARD STALLS (UNCOVERED) PROVIDED:	74 STALLS
- ACCESSIBLE PARKING PROVIDED:	10 STALLS (REQ. IS 2% OF TOTAL = 8 STALLS)
- MOTORCYCLE	7 SPACES
- FUTURE ELECTRIC VEHICLE CHARGING (INDICATED ON SITE PLAN AS 'EV' PART OF STANDARD STALL COUNT)	12 STALLS (3% OF PARKING PROVIDED)

OFFICE PARKING PROVIDED:	
- STANDARD STALLS	28 STALLS
- ACCESSIBLE PARKING PROVIDED:	1 STALL

OTHER PARKING:	
** SUBSTITUTION FOR AUTOMOBILE PARKING IS (1) STALL PER 8 BICYCLE RACKS, UP TO 10% MAXIMUM OF REQUIRED VEHICLE SPACES	** 417 X 10% = 41 / 8 = 5 STALL REDUCTION
MOTORCYCLE SPACES ALLOWED:	$\frac{1}{25}$, UP TO 10% MAX. OF REQUIRED VEHICLES
***SUBSTITUTION FOR AUTOMOBILE PARKING IS (1) SPACE PER 25 MOTORCYCLE SPACES, UP TO 10% MAXIMUM OF REQUIRED VEHICLE SPACE	***417 X 10% = 41 SPACES 41 / 25 = 2 SPACE REDUCTION (5 MOTORCYCLE SPACES PROVIDED , 41 ALLOWED, THUS "OK")

SOURCE: Williams + Paddon 2017

FIGURE 2-5

Alternative B Site Plan

Dorsey Marketplace EIR

DUDEK

CHAPTER 3
LAND USE

This section addresses the potential land use impacts associated with the proposed Dorsey Marketplace Project (proposed project). The proposed project would change portions of the land use and zoning designations on approximately 26.8 acres in the City of Grass Valley (City). Alternative A would provide for up to 90 multifamily residential units and approximately 178,960 square feet of commercial space. Alternative B would provide ~~171~~ 172 apartments, approximately 104,350 square feet of commercial space, and approximately 8,500 square feet of office space. This section evaluates potential impacts of each alternative related to changing the existing and planned land uses for the site, as well as the compatibility of the proposed development with surrounding land uses.

One comment pertaining land use concerns was received in response to the Notice of Preparation. The comment questioned the proposed project's economic and community character-related impacts on the historic downtowns of Grass Valley and Nevada City. The Notice of Preparation and comments received are included in Appendix A.

3.1 ENVIRONMENTAL SETTING

The project site is located within the City of Grass Valley (City), in Nevada County. The City's General Plan notes that in addition to serving the City's residents, the City functions as a "regional economic and cultural center" for as many as 70,000 residents in Nevada County and parts of the three neighboring counties. Although the City has only 12% of the County's total housing stock, it provides about 55% of Nevada County's multifamily housing units. Nearly 60% of City residents rent. About one-quarter of the City remains undeveloped. Some of this land, however, is so constrained by natural factors that development may never occur. The General Plan expects infill development to accommodate about one-third of new housing in the Planning Area, including the City in the next 20 years (City of Grass Valley 1999).

Project Site

The project site is bordered by State Route (SR) 20/49 to the west, Dorsey Drive to the north, the Old Barn and Ernie's Storage to the south and the Grass Valley Terrace Apartments to the east. As shown in Figure 2-2, Project Vicinity Map, in Chapter 2, Project Description, the site is located between the SR 20/49 off-ramps for Dorsey Drive and Idaho-Maryland Road. The project would be accessible from Dorsey Drive and from Spring Hill Drive, which accesses Idaho-Maryland Road. Figure 2-3, Project Site, identifies the 26.8-acre site on an aerial photograph. The site is located at approximately 39°13'41.3"N 121°02'33.8"W and contains three parcels, designated Assessor's Parcel Number (APN) 35-260-62, 35-260-63, and 35-260-64.

The project site was the former location of the Spring Hill Mine, which operated at the site intermittently during the late 1800s and through the 1940s. Abandoned mine features located on site include excavations, pits, remnants of building foundations, stockpiles of mine waste rock, and dry tailings ponds. The property is vacant and has not been developed since the mining activities (Appendix J).

Project Site General Plan and Zoning Designations

Land uses for the project area are determined by the City of Grass Valley 2020 General Plan and the City of Grass Valley Zoning Ordinance. The project site is currently designated under the General Plan as Business Park and zoned Corporate Business Park, as shown in Table 3-1 and on Figure 3-1, General Plan Designations, and Figure 3-2, Zoning Designations.

As shown in Table 3-1 and on Figures 3-1 and 3-2, under Alternative A, the project would require a General Plan Amendment to designate 21 acres of the site Commercial and 5.8 acres of the site Residential Urban High Density. The project would also require rezoning the property to 21 acres of Central Business District (C-2) and 5.8 acres of Multiple Dwelling Residential (R-3). This would facilitate the proposed development of 178,960 square feet of commercial building space and 90 multifamily dwelling units.

Table 3-1 and Figures 3-1 and 3-2 also show that under Alternative B, the project would require a General Plan Amendment to designate 14.5 acres of the site Commercial and 12.3 acres of the site Residential Urban High Density. The project would also require rezoning the property to 14.5 acres of Commercial (C-2) and 12.3 acres of Multiple Dwelling Residential (R-3). This would facilitate the proposed development of 172~~1~~ multifamily dwelling units, approximately 104,350 square feet of commercial space, and approximately 8,500 square feet of office space.

Table 3-1
General Plan and Zoning Designations

	Existing	Alternative A	Alternative B
General Plan Designations	Business Park – 26.8 acres	Commercial – 21 acres Residential Urban High Density – 5.8 acres	Commercial – 14.5 acres Residential Urban High Density – 12.3 acres
Zoning Districts	Corporate Business Park – 26.8 acres	Central Business District (C-2) – 21 acres Multiple Dwelling Residential (R-3) – 5.8 acres	Central Business District (C-2) – 14.5 acres Multiple Dwelling Residential (R-3) – 12.3 acres

Surrounding Land Uses

SR 20/49 runs parallel to the project site's western boundary. On the west side of SR 20/49, properties are designated in the General Plan for Institutional/Non-Governmental and Office/Professional uses, and are zoned Public (P) and Office Professional (OP). Land uses on this side of SR 20/49 include the Golden Empire Nursing and Rehab Center, the Sierra Nevada Memorial Hospital, office uses—with a predominance of medical offices, and limited residential areas. Areas to the south and southeast are zoned Light Industrial (M-1) and support three self-storage facilities (Old Barn, Ernie's and Springhill), Bub Enterprises Inc. Gold Country Gymnasium and Warm's Yoga. The Grass Valley Terrace Apartments are located east of the project site while the Springhill Garden Apartments are located north of the project site on the other side of Dorsey Drive. Both of these properties are zoned Medium Density Residential (R-2A). A residential neighborhood to the northeast of the project site is zoned Multiple Family Residence (R-3) (County of Nevada 2018).

Downtown/Town Center Area

The project site is located approximately 1.25 miles northeast of the historic downtown area. The downtown area sits in the southern-central area within the City limits and runs along Neal Street and Mill Street, west of SR 20/49. Downtown is bounded, roughly, by Neal Street to the South, Richardson Street to the North, School Street to the West, and Tinloy Street to the East. Downtown Grass Valley is comprised of the original townsite founded in 1850 and surveyed and recorded in 1872. This historic area is one of the main tourist attractions in the City as the stores and buildings retain the gold rush era facades. The downtown area comprises numerous hotels, motels, dining establishments, bakeries, coffee shops, and commercial and office space, such as insurance companies and real estate services (City of Grass Valley 1999).

Land Development Trends

The General Plan identifies probable trends and tendencies, termed "dynamics and directions", which were developed for the major land use categories: commercial, office/professional, manufacturing/industrial, and residential (City of Grass Valley 1999).

The General Plan describes that commercial growth in the City occurs mainly in the form of turnover and upgrading within existing shopping centers and commercially-used buildings. This has occurred over time in response to several major stimuli, particularly Sierra College growth and development; growth in the medical/health care sector; a growing tourism/visitor-induced economy; and demographic changes, particularly the large and growing senior population. Since 1980, local commercial "infrastructure" has expanded faster than local population growth. The General Plan noted that the large, modern shopping centers within the City support Grass Valley's role as the regional commercial center for western Nevada County and that strong growth was

anticipated for business-related support retail and services, medical-related goods and services, tourist-related services (lodging, restaurants), and enterprises geared to senior citizens and retirees. The General Plan also anticipated some commercial intensification, primarily at the immediate edge of the Glenbrook area and Downtown.

In regards to residential growth, the General Plan forecast a need for almost 3,000 new dwelling units, and projected that 45% of these would be multifamily units. The General Plan established a goal of meeting one-third of the housing demand through infill development, including multifamily units in medium- and high-density residential projects.

Other Approved and Pending Development Projects in the City of Grass Valley

Table 3-2 provides a summary of other development projects in the City of Grass Valley. The list of approved and pending projects was determined based on a review of the City's pending project list and consultation with City staff.

Table 3-2
Summary of Approved and Proposed Developments

Project Name and Location	Number of Residential Units Planned or Proposed	Square Feet of Commercial/ Office Space	Status
Sierra Terrace; Berryhill Drive and East Main Street	28	0	Approved
Makiah Woods; Brunswick Road and Town Talk Road	49	0	Approved (Under Construction)
Loma Rica Ranch, Brunswick Road and Sutton Way	700	54,500 Commercial 346,161 Office	Approved
Gold Country Village 1; East Main Street and Joerschke Drive	160 senior apartments; 13 dwelling units	0	Approved
Gold Country Village 2; E Bennett Street	120		Approved (Phase 1 completed, 80 units occupied)
Wolf Creek Village; Freeman Lane and McKnight Way	70	0	Approved
Berriman Ranch; Picadilly Lane and Freeman Lane	121	0	Approved
314 Railroad Avenue; Railroad Avenue and Idaho-Maryland Road	0	27,596 Office	Approved
Ridge Meadows; Ridge Road and Upper Slate Creek Road	37	0	Approved (Completed)
Village at South Auburn; South Auburn Street and Whiting Street	49	23,264 Retail/Office	Approved

Table 3-2
Summary of Approved and Proposed Developments

Project Name and Location	Number of Residential Units Planned or Proposed	Square Feet of Commercial/ Office Space	Status
Milco III; Whispering Pines Lane and Clydesdale Court		57,315 Industrial	Approved
Victoria Grove; Whiting Street and South Auburn Street	72		Approved
500 Idaho-Maryland Road		22,500 Warehouse/Light Manufacturing	Approved

Agricultural Lands

The California Department of Conservation administers the Farmland Mapping Monitoring Program, which produces maps and statistical data for California's agricultural resources. Agricultural land is rated according to soil quality and irrigation status. The best quality land is "prime farmland," and rural land less suited for crop production is usually categorized as "grazing land."

The Department of Conservation Farmland Mapping Monitoring Program designates the project site as "urban and built-up land." Land classified as urban and built-up land is land that is occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre area (DOC 2016).

The California Land Conservation Act of 1965 (Williamson Act) is a non-mandated state policy providing for preferential assessment of agricultural and open space lands that meet local size and use criteria. In exchange for reduced property taxes, owners of Williamson Act lands place their land holdings under contract with participating cities and counties; the owners are then prohibited from developing their properties during the contract period. No land on the project site is currently under a Williamson Act contract.

3.2 REGULATORY FRAMEWORK

Federal Regulations

There are no federal land use regulations that pertain to this EIR's analysis of the project's environmental effects.

State Regulations

California Government Code Section 65300 requires each county and city to adopt a general plan to guide development decisions. Further, California planning law dictates that all land use decisions must be consistent with the implementing jurisdiction's adopted General Plan. Therefore, the proposed project must be consistent with the City's General Plan and the City's Zoning Ordinance. The City of Grass Valley 2020 General Plan (City of Grass Valley 1999) establishes the City's development goals and policies; sets the land use, housing, and development policies for the City; and designates allowable land uses for all property throughout the City and its Sphere of Influence.

Local Regulations

Grass Valley 2020 General Plan

The City of Grass Valley 2020 General Plan establishes a vision for the City that includes preserving historic and scenic resources within the city, encouraging development of a variety of residential building types, and protecting the downtown while diversifying the City's economy (City of Grass Valley 1999). The General Plan "strives to maintain Grass Valley's small town character and sense of community in a number of ways, including an emphasis on infill development, neighborhood integrity, community design and creation of community and neighborhood gathering places" and states that the goals, objectives, policies, and implementation measures established in the General Plan are intended to facilitate a climate of preserving, protecting, maintaining, and enhancing quality of life in the City (City of Grass Valley 1999).

Many of the City's General Plan policies applicable to the proposed project were adopted with the intent to reduce the environmental impacts of ongoing development, while land use designations were adopted to provide the long-range planning necessary to minimize conflicts between adjacent land uses and provide adequate infrastructure.

1-LUG: Promote balanced community growth and development in a planned and orderly way.

1-LUO: Availability of sufficient building sites properly zoned to accommodate projected growth.

2-LUG: Promote infill as an alternative to peripheral expansion where feasible.

3-LUG: In areas of new development, plan for a diversity of land uses and housing types, including mixed use developments.

6-LUO: Reduction in congestion and travel time to acquire needed goods and services.

8-LUO: Provision of a full range of housing opportunities and types.

5-LUG: Provide for a broad range of housing opportunities, including opportunities for low, moderate and middle income households.

12-LUO: Designation of residential building sites sufficient in number and variety to meet projected demand.

6-LUG: Promote a jobs/housing balance within the Grass Valley region in order to facilitate pleasant, convenient and enjoyable working conditions for residents, including opportunities for short home to work journeys.

15-LUO: Reduction in the number of vehicle miles driven.

17-LUO: Future employment opportunities as adults for today's youth in well-paying local jobs.

7-LUG: Create a healthy economic base for the community, including increasing employment opportunities through attraction of new and compatible industry and commerce, and through retention, promotion and expansion of existing businesses.

19-LUO: Employment opportunities for present and future residents.

20-LUO: An expanding local tax base.

24-LUO Ability to respond to new service demands and the needs of a changing population.

2-LUP: Require adequate information when reviewing development proposals, including full environmental review and fiscal impact analyses, to assure minimization of environmental, public facilities and services impacts.

3-LUP: Maintain standards for population density and building intensity for each land use category identified in the General Plan.

4-LUP: Identify areas appropriate for infill development and show them on the Land Use Diagram.

5-LUP: Actively market infill and available parcels during contacts with developers and community members.

6-LUP: Develop a more specific development strategy for identified infill parcels following General Plan adoption.

8-LUP: Encourage and facilitate mixed-use developments on infill sites.

9-LUP: Provide for higher residential densities on infill sites and in the Downtown area.

11-LUP: Where feasible, treat newly developing areas as Planned Developments.

12-LUP: Permit increases in residential density (clustering) on portions of development sites while maintaining overall density.

13-LUP: Encourage convenience goods and services opportunities to be incorporated into any significant development proposal.

14-LUP: Encourage incorporation of multiple family development in new development areas while maintaining high design standards.

22-LUP: Assure that a sufficient number of sites are zoned for multiple family use.

23-LUP: Encourage mixed use developments incorporating a variety of densities on infill sites and in areas proposed for annexation.

24-LUP: On large parcels, encourage clustering of residential units on the most developable portions of the site in order to reduce infrastructure and other housing-related construction costs.

25-LUP: Utilize clustering and other land use techniques to protect environmentally sensitive resources, such as heritage trees and wetlands.

30-LUP: Encourage mixed use developments on larger parcels in newly developing areas incorporating jobs generating businesses and industry housing.

31-LUP: Promote primary jobs and core employment opportunities; those that export goods while importing capital.

37-LUP: Assure that new development pays its fair share of the cost of municipal services.

City of Grass Valley Zoning Ordinance – Development Code

The City of Grass Valley Development Code carries out the policies of the Grass Valley General Plan by classifying and regulating the uses of land and structures within the City, consistent with the General Plan. This Development Code is adopted to protect and promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents, and businesses in the City. More specifically, the purposes of this Development Code are to:

- Provide standards and guidelines for the continuing orderly growth and development of the City that will assist in protecting the historical small town character and community identity of Grass Valley;
- Conserve and protect the City's natural beauty and setting, including scenic vistas, cultural and historic resources, hills and trees;
- Ensure that proposed development and new land uses conserve energy and natural resources;
- Create a comprehensive and stable pattern of land uses upon which to plan transportation, water supply, sewerage, energy, and other public facilities and utilities;

- Ensure that development is of human scale, primarily pedestrian-oriented, and designed to create attractive streetscapes and pedestrian spaces;
- Minimize vehicle traffic by providing for a mixture of land uses, pedestrian-oriented development, compact community form, safe and effective traffic circulation, and adequate on- and off-street parking facilities;
- Provide neighborhoods with a variety of housing types to serve the needs of a diverse population; and
- Ensure compatibility between different types of development and land uses.

Grass Valley Redevelopment Project Area Redevelopment Plan

In 2009, the Grass Valley Redevelopment Agency adopted an Expansion Feasibility Study (Fraser & Associates 2009) that considered amendments to the Grass Valley Redevelopment Project Area's Redevelopment Plan. The amendments evaluated in that study considered adding 504 acres of land located north of the intersection of East Main Street and Idaho Maryland Road, including the proposed Dorsey Marketplace project site, to the Redevelopment Project Area. The feasibility study found that the added area warranted redevelopment because many properties in the area are in need of revitalization to address issues of inadequate public infrastructure, stagnant property values, and environmental contamination. There was a total of 95.8 acres of vacant land within the 504 acres of added area. Where environmental contamination, such as hazardous waste, impairs property values, this is considered an economic blight condition. Exhibit 8 of the feasibility study identifies the Dorsey Marketplace project site as having an economic blight condition due to its status as an active hazardous material case.

Grass Valley Economic Development Strategy

In 2011, the Grass Valley City Council adopted an Economic Development Strategy (City of Grass Valley 2011) intended to support attainment of the City's vision of promoting "the economic vitality of the region by serving as the Economic Hub of Western Nevada County." The Economic Development Strategy includes a mission statement of enhancing "the economic vitality of the community by taking actions that support opportunities for wealth creation and enhanced community services that enable people to pursue an exceptional quality of life." It also includes a specific objective of growing and reshaping the retail and commercial sectors to capture a greater share of business activity. The Strategy identifies increases in retail sales activity, transient occupancy tax activity, property taxes and commercial lease rates and occupancy fluctuations as

key performance measures. The following goals and strategies from the Economic Development Strategy are relevant to consideration of the proposed Dorsey Marketplace project:

- Goal 1: Promote Primary Job Growth – Ready for the Next Wave
  - Strategy 1.4 Increase inventory of vacant and/or underutilized business park and industrial lands
  - Strategy 1.6 Partner with various stakeholders to attract/retain priority businesses.
- Goal 3: Enhance Community Identity – The look and feel of a Great Town
  - Strategy 3.2 Enhance historic image and economic vitality of downtown and adjoining business districts
    - Action Plan 5 Continue to implement EPA Brownfield Grant program by identifying priority parcels, contamination challenges and developing clean-up strategies. Pursue additional funding sources to clean up priority parcels.

In support of development and implementation of the Economic Development Strategy, the City retained consultants to prepare a Market Overview (Buxton 2010) and a Retail Research Report (Chabin Concepts 2013). The Market Overview analyzed regional consumer spending and consumer preferences and identified goods and services that meet consumer demands in the region. The report found that additional retail development within the City is viable because the City of Grass Valley and surrounding region support sufficient population with a wide range of demographic characteristics. The Buxton report estimated the regional retail leakage in the secondary trade area (which includes the City and surrounding areas) to be in excess of $200 million annually.

The Retail Research Report included a retail survey and focus group sessions, with an objective of providing information that would guide the City's retail recruitment, retention and expansion efforts. The retail survey identified that the primary shopping areas for City residents are Grass Valley and Roseville, and that the key reasons for shopping outside of the local area are pricing and selection. The survey was followed up by three focus groups; findings from those sessions include that the region's retail sales leakage would best be addressed with more retail in the General Merchandise category and locally-owned and/or independently-owned businesses, and that the addition of a chain or big box store would offer a greater variety of products at lower prices but would not be expected to adversely affect existing local merchants because they offer unique products (Chabin Concepts 2013).

Taken together, the Economic Development Strategy and the supporting analyses define the City's general approach to economic development as including enhancing neighborhood amenities, creating jobs, capturing leakages, increasing the tax base, and providing convenient access to goods and services.

3.3 IMPACTS

Methods of Analysis

The following assessment of land use impacts is based on a review of applicable plan, policy, and regulatory documents, as well as consultation with City of Grass Valley Planning Department staff. Information related to land uses was reviewed in light of the proposed project to evaluate the project's consistency with relevant plans and policies, and to determine land use compatibility.

The first impact discussed in this section relates to the consistency of the proposed project with all applicable City environmental resource policies, including those resource policies and environmental issue areas covered in other sections of this EIR. Where mitigation measures are necessary to ensure compliance with the City's environmental resource policies, those measures are referenced in the first impact discussion. The full text of each mitigation measure is presented in each of the sections of this EIR, and is not repeated here.

The project site does not include any farmland designated as Prime, Unique, or of Statewide Importance or contain any lands under a Williamson Act contract. The project would not convert designated farmland to nonagricultural uses, and therefore, the proposed project would result in no impact to agricultural uses, farmland, or Williamson Act contract lands. In addition, the project is not located adjacent to farmland; therefore, the project would not hasten the conversion of farmland to nonagricultural uses. Thus, these issues are not further evaluated.

The land use analysis in an EIR does not typically include a discussion of cumulative impacts because the consistency analysis of applicable land use goals and policies and compatibility with existing adjacent uses do not relate to potential additive effects. Further, the project site is an infill site, with existing development on all sides and redevelopment of any of the adjacent properties is not reasonably foreseeable. Therefore, there are no significant land use consistency impacts where the project, in combination with impacts from other projects, could contribute to a cumulative land use impact. Thus, cumulative land use effects are not further evaluated. Potential cumulative land use compatibility issues such as those related to noise levels, traffic conditions, or air quality degradation are addressed within the appropriate resource section of this EIR.

Significance Criteria

Appendix G of the CEQA Guidelines provides the criteria that were used to determine whether the proposed project would have a significant environmental impact related to land use. Potentially significant impacts associated with the proposed project have been evaluated using the following significance criteria. Would the project:

- 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, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

- Substantially conflict with surrounding land uses (current and planned) or physically divide an existing community?

Impact Analysis

Impact 3-1: Would the project conflict with land use plans, policies, or regulations?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation Measures 6a, 6b, 6c, 6d, 6e, 6f, 7a, 9b, 9c, 9d, 10a, and 10b	Mitigation Measures 6a, 6b, 6c, 6d, 6e, 6f, 7a, 9a, 9c, 9d, 10a, and 10b
Significance after mitigation:	Less than significant	Less than significant

Alternative A

Land use planning impacts are evaluated in this section by determining whether the commercial and multifamily residential land uses proposed under Alternative A are in compliance with goals, policies, and land use designations of the General Plan, City zoning requirements, and other relevant policy documents. The analysis focuses specifically on policies that, if violated, may contribute to some direct or reasonably foreseeable indirect environmental impact (as defined by the CEQA Statutes and Guidelines) compared to what would be anticipated with full policy compliance. The focus of the section is on policies that apply to housing and commercial projects, not on policies that apply to the City itself, and not policies that specifically apply to a type of land use not proposed as a part of the project. The City's environmental policies do not always allow qualitative or definitive evaluation. Therefore, although this EIR does thoroughly analyze and report on project consistency with environmental policies, it is the City Planning Commission and Council who will make the ultimate determination in this regard.

As discussed in Section 3.2, Regulatory Framework, land uses at the project site are governed by the City's General Plan and Zoning Ordinance. The General Plan designation for the project site is Business Park while the site is zoned Corporate Business Park. Alternative A proposes a General Plan Amendment to change land currently designated for Business Park to 21 acres of Commercial and 5.8 acres of Residential Urban High Density, and a rezone from Corporate Business Park to Central Business District (C-2) and Multiple Dwelling Residential (R-3), as shown in Table 3-1.

Residential Urban High Density Land Use

This area would be located in the southeastern portion of the project site, adjacent to Spring Hill Drive, as shown in Figure 2-4, Alternative A Site Plan. Alternative A proposes to change the land use designation of this 5.8-acre area from Business Park to Residential Urban High Density, as shown in Figure 3-1 and would change the zoning on this portion of the site from CBP to R-3. This would allow development of 90 multifamily dwelling units at a density of 15.8 dwelling units

per acre. Under the existing CBP zoning, 8 residential units per acre are allowed, thus the site could accommodate a maximum of 215 dwelling units.

The project design is consistent with the development standards under the City's R-3 zone district. The R-3 portion of the project is 5.8 acres, which exceeds the minimum allowable lot size of 10,000 square feet. The apartment buildings would meet the applicable setback requirements by ensuring a minimum front setback of 15 feet from Spring Hill Drive, interior side setbacks of at least 5 feet, and a rear setback between 10 feet and 20 feet.

Commercial Land Use

As shown in Figure 2-4, the Commercial land use area would comprise the majority of the project site, totaling 178,960 square feet of commercial space and associated parking, circulation, and pedestrian improvements. Alternative A would change the land use designation from Business Park to Commercial, and would rezone 21 acres from Corporate Business Park to Central Business District (C-2). In the City's C-2 zone district, there is no minimum allowable lot size and no front or street side setbacks are required while a 12-foot rear setback is required for loading.

General Plan Consistency

General plans provide the long-term objectives, principles, and standards for development, and all development proposals must be generally consistent with the overall land use guidance provided in a general plan. More detailed regulation and land use controls are applied through the City's zoning, subdivision, and grading requirements, as well as through other City regulations and ordinances.

Implementation of Alternative A would result in a change in land use at the project site as compared to the land uses anticipated for the site under the City's General Plan. The following discussion evaluates Alternative A in comparison to the land use planning goals and policies contained in the City's 2030 General Plan, applicable ordinances, and other planning documents. Additional details regarding the project's consistency with the City's policies and ordinances that address specific environmental resources are provided in the individual resource sections in this Draft EIR.

Alternative A would entail the development of residential and commercial uses on land currently designated for business park development, as shown in Table 3-1. The CBP zone district anticipates development of employment opportunities in a campus setting, "which includes landscaped open space between buildings, screened service areas, uniform sign and street lighting standards and maintenance of a landscape theme throughout" (City of Grass Valley 2007). Residential uses as a component of a mixed use project with a maximum density of 8 dwelling units per acre are allowed in the CBP zone district subject to a use permit. Permitted retail uses in

the CBP zone are limited to neighborhood market; office-supporting retail; restaurants, cafes and coffee shops; and warehouse retail. The project would re-designate 5.8 acres of business park use to residential, leaving 21 acres designated for commercial. Some retail is allowed under the existing zoning, but the change to C-2 would allow more variety of retail. The commercial areas are proposed to be arranged in a shopping center setting, which would reflect some of the campus setting attributes noted in the City's Development Code, by providing cohesive architecture, vehicle and pedestrian circulation, uniform sign and lighting standards, and maintenance of a landscape theme. With 90 proposed dwelling units, Alternative A would develop fewer residences than could be allowed under the existing zoning.

Alternative A is consistent with the City's General Plan goals, objectives, and policies listed in Section 3.2. By providing 90 multifamily dwelling units, Alternative A would support attainment of the General Plan goals and objectives to increase the amount of multifamily housing in the City. By providing commercial space, Alternative A would increase shopping opportunities in the City of Grass Valley, which could result in capture of some of the sales activities lost to other shopping destinations in the region (Appendix D). This would support the City's implementation of the adopted Economic Development Strategy and the retail sales capture could reduce travel time and vehicles miles traveled to acquire needed goods and services. The project would also include mixed use development; expand employment and business through commerce; expand the local tax base; and provide for mixed use and higher residential densities on infill sites. Existing and planned utilities for and surrounding the project site would be able to support a residential population, as discussed in Chapter 14, Public Services and Utilities. As discussed in Chapter 5, Aesthetics, the proposed development of commercial land uses at the site would not draw business away from the downtown, thus the project would not impair the City's ability to maintain a focus on commercial development in the project's designated town center (Appendix D).

Alternative A would be partially inconsistent with the existing land use and zoning designations on the project site. However, the project applicant requests approval of amendments to the land use and zoning designations to ensure consistency. The proposed residential and commercial land uses would be compatible with surrounding uses and densities. Overall, the project meets the intent of the City's General Plan to ensure future development in this area is carefully coordinated and integrated to promote infill; reduce travel time to acquire needed goods and services; provide mixed use development with multifamily dwelling units; and expand the local tax base. Land use impacts related to the proposed project's inconsistency with the existing land use and zoning designations would, therefore, be **less than significant**.

Appendix C to this Draft EIR provides a detailed analysis of the project's consistency with the City's General Plan policies. As described in Appendix C, the proposed project would require implementation of mitigation measures to ensure consistency with several policies. Thus, Alternative A would have a **potentially significant** impact resulting from inconsistency with the

General Plan, but that impact would be reduced to a **less than significant** level with implementation of the mitigation measures identified in the following summary:

- **Conservation and Open Space Element:** 3-COSO regarding impacts to protected species: **Mitigation Measure 6a, 6b, and 6c** requires the project to survey and avoid impacts to species.
- **Conservation and Open Space Element:** 3-COSG regarding habitat protection: **Mitigation Measure 6d, 6e, and 6f** requires construction worker training, obtaining a Clean Water Act Section 404 permit and Section 401 Water Quality Certification, and submittal of evidence of compensatory habitat restoration.
- **Conservation and Open Space Element:** 6-COSG: regarding compliance with and understanding of air and water quality regulations and standards. **Mitigation Measure 10a and 10b** verification of construction contract requirements and verification of building plans to reduce impacts on air quality.
- **Historical Element:** Policy HP-11 regarding preservation of unknown cultural resources: The proposed project has the potential to uncover archaeological or historic resources during excavation and grading. **Mitigation Measure 7a** requires construction worker training and stipulates procedures to be followed in the event of a discovery.
    - **Noise Element:** 1-NG regarding maintaining a relatively quiet environment without unnecessary, annoying and potentially damaging noise: Chapter 9, Noise, of this Draft EIR presents an acoustical analysis and includes **Mitigation Measures 9b, 9c, and 9d**, which are identified to ensure that noise impacts are reduced to acceptable levels.

Alternative B

As discussed in Section 3.2, land uses at the project site are governed by the City's General Plan and Zoning Ordinance. The General Plan designation for the project site is Business Park while the site is zoned CBP. The proposed land use and zoning designations under Alternative B are shown in Table 3-1. This alternative proposes a General Plan Amendment to designate 14.5 acres of the site Commercial and 12.3 acres of the site Residential Urban High Density. The project would also require rezoning the property to 14.5 acres of Central Business District (C-2) and 12.3 acres of Multiple Dwelling Residential (R-3). This would facilitate the proposed development of 172~~1~~ multifamily dwelling units, approximately 104,350 square feet of commercial space, and approximately 8,500 square feet of office.

Residential Land Use

Under Alternative B, the project would develop 1721 ~~1~~ multifamily dwelling units. This is less than the 213 units that could be accommodated under the existing CBP zoning, which allows a maximum density of 8 dwelling units per acre. Under Alternative B, the multifamily dwelling units would be located in the 12.3 acres of the site designated Residential Urban High Density and zoned R-3.The R-3 zone district allows a maximum density of one unit for every 2,000 square feet of site area. It requires a 15-foot front setback to the building façade, which is reduced to 5 feet for a front porch. Side setbacks must be a minimum of 5 feet, or 15 feet to an adjacent street; and rear setbacks must be between 10 feet and 20 feet.

Commercial Land Use

Under Alternative B, the project would develop 104,350 square feet of commercial uses and associated parking, circulation, and pedestrian improvements. Alternative B would change the land use designation for the area that would support from commercial land uses from Business Park to Commercial and change the zoning from CBP to C-2. The allowable land uses and development standards (such as setbacks) for the Commercial land use designation and C-2 zone district described previously in the Alternative A discussion would apply to the project site under Alternative B.

Office Land Use

Under Alternative B, the project would develop 8,500 square feet of office land uses. Office uses are allowed under the existing CBP zoning; this zone district anticipates development of employment-generating administrative and research and development offices. Alternative B would place the office land uses adjacent to the multifamily dwelling units and south of the commercial land uses. The Commercial land use designation and C-2 zone district would be applied to the area supporting office land uses. The allowable land uses and development standards (such as setbacks) for the Commercial land use designation and C-2 zone district described previously in the Alternative A discussion would apply to the project site under Alternative B. The Grass Valley Development Code identifies business, service, government, professional, and administrative offices as permitted uses in the C-2 zone district.

General Plan Consistency

Implementation of Alternative B would result in a change in land use at the project site as compared to the business park land uses anticipated for the site under the City's General Plan. This alternative would develop a portion of the office uses anticipated for the site, and would include residential and commercial components. Under Alternative B, the project applicant requests amending the General Plan designations for the site to Commercial and Residential Urban High Density and amending the

zoning designations for the site to C-2 and R-3**,** as shown in Table 3-1, with 12.3 acres designated for residential uses and 14.5 acres designated for commercial uses. Under the existing CBP zoning, the site could support a maximum density of 8 dwelling units per acre, which would accommodate up to 213 dwelling units. Under the C-2 zoning, the site could support a maximum density of 15 dwelling units per acre. Alternative B proposes 172~~1~~ dwelling units to be located in the southern portion of the project site, to be located in the proposed R-3 zone district. The maximum allowable density in the R-3 zone is one unit per 2,000 square feet of site area, thus the 12.3-acre R-3 area could support a maximum of 267 units. Alternative B proposes to locate the 172~~1~~ dwelling units in the southern portion of the site, along with the proposed office space, leaving the northern and central portions of the site for commercial uses. Development of office space within the project site is consistent with the existing CBP zoning of the site, which is intended to "provide opportunities for corporate administrative offices and medium size research and development firms" (City of Grass Valley 2007). As discussed previously, some retail is permitted in the CBP zone, but under the proposed General Plan and zoning amendments Alternative B would allow for a wider range of commercial uses than anticipated.

Alternative B is consistent with the City's General Plan goals, objectives, and policies listed in Section 3.2. By providing 172~~1~~ multifamily dwelling units, Alternative B would support attainment of the General Plan goals and objectives to increase the amount of multifamily housing in the City. By providing commercial space, Alternative B would increase shopping opportunities in the City of Grass Valley, which could result in capture of some of the sales activities lost to other shopping destinations in the region, though the ability to capture retail sales would be less than presented under Alternative A (Appendix D). Alternative B would support the City's implementation of the adopted Economic Development Strategy and the retail sales capture could reduce travel time and vehicles miles traveled to acquire needed goods and services. The project would also include mixed use development; expand employment and business through commerce; expand the local tax base; and provide for mixed use and higher residential densities on infill sites. Existing and planned utilities for and surrounding the project site would be able to support a residential population, as discussed in Chapter 14. As discussed in Chapter 5, the proposed development of commercial land uses at the site would not draw business away from the downtown, thus the project would not impair the City's ability to maintain a focus on commercial development in the project's designated town center (Appendix D).

The proposed residential, commercial, and office land uses would be compatible with surrounding uses and densities. Overall, Alternative B meets the intent of the City's General Plan to ensure future development in this area is carefully coordinated and integrated to promote infill; reduce travel time to acquire needed goods and services; provide mixed use development with multifamily dwelling units; and expand the local tax base. Land use impacts related to Alternative B's inconsistency with the existing land use and zoning designations would, therefore, be **less than significant**.

Appendix C to this Draft EIR provides a detailed analysis of the project's consistency with the City's General Plan policies. As described in Appendix C, the proposed project would require implementation of mitigation measures to ensure consistency with the several policies. Thus, Alternative B would have a **potentially significant** impact resulting from inconsistency with the General Plan, but that impact would be reduced to a **less than significant** level with implementation of the mitigation measures identified in the following summary:

- **Conservation and Open Space Element:** 3-COSO regarding impacts to protected species: **Mitigation Measure 6a, 6b, and 6c** requires the project to survey and avoid impacts to species.
- **Conservation and Open Space Element:** 3-COSG regarding habitat protection: **Mitigation Measure 6d, 6e, and 6f** requires construction worker training, the acquirement of a Clean Water Act Section 404 permit and Section 401 Water Quality Certification, and submittal of evidence of compensatory habitat restoration.
- **Conservation and Open Space Element:** 6-COSG regarding compliance with and understanding of air and water quality regulations and standards. **Mitigation Measure 10a and 10b** verification of construction contract requirements and verification of building plans to reduce impacts on air quality.
- **Historical Element:** Policy HP-11 regarding preservation of unknown cultural resources: The proposed project has the potential to uncover archaeological or historic resources during excavation and grading. **Mitigation Measure 7a** requires construction worker training and stipulates procedures to be followed in the event of a discovery.
    - **Noise Element:** 1-NG regarding maintaining a relatively quiet environment without unnecessary, annoying and potentially damaging noise: Chapter 9, Noise, of this Draft EIR presents an acoustical analysis and includes **Mitigation Measures 9a, 9c, and 9d**, which are identified to ensure that noise impacts are reduced to acceptable levels.

Impact 3-2: Would the project conflict with surrounding land uses, current and planned, or physically divide an existing community?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation Measures 5a, 8a, 8b, 8c, 8d, 8e, 8f, 8g, 9c, 10a, 10b, and 15a	Mitigation Measures 5a, 8a, 8e, 8h, 9c, 10a, 10b, and 15a
Significance after mitigation:	Less than significant	Less than significant

Alternative A

As discussed in Section 3.1, Environmental Setting, existing and proposed land uses surrounding the project site are generally residential to the north, northeast, and east of the project site,

industrial to the south, and office and public to the west. SR 20/49 runs along the western side of the project site. Zoning designations surrounding the project site are Light Industrial, Medium Density Residential, Multiple Family Residence, Office Professional, and Public.

The project site is currently vacant (with the exception of building foundations that are remnants of the Spring Hill Mine), and there are no established communities on site that the proposed development would disrupt or divide. Although residential communities are located to the north, northeast, and east of the site, development of the largely vacant project site under Alternative A would not disrupt or divide the existing neighborhoods.

There is a wide range of land use and zoning designations on properties in the project vicinity. The residential component of the project would consist of Multiple Dwelling Residential (R-3) zoning, which allows for multifamily apartment buildings included as part of mixed-use projects. The proposed residential density within the project site is consistent with the range of densities for existing residential uses surrounding the project site (R-2A and R-3-MH). Further, the proposed residential density is consistent with the City's General Plan policies encouraging and accommodating multifamily development in areas of the City and higher residential densities on infill sites. The commercial (C-2) component of the project would not conflict with the existing light industrial (M-1) to the south and would be compatible with the C-2 zoned land north of the site beyond the existing residential area and southwest of the site on the western side of SR 20/49. Additionally, the mixed use and commercial plans are consistent with General Plan policies that encourage and facilitate mixed use developments on infill sites, promote jobs and employment opportunities, and encourage convenience goods and services opportunities to be incorporated into development proposals.

Environmental resource areas that can indicate a potential for a project to be incompatible with existing land uses include those related to changes to the existing visual environment, increases in traffic volumes and congestion, increases in noise, air quality degradation, and exposure to hazardous materials. This analysis summarizes how these compatibility issues have been analyzed and addressed within the appropriate resource sections of this EIR.

The project would not result in significant adverse visual impacts, as discussed in more detail in Chapter 5 Aesthetics. The site is adjacent to a multifamily residential development to the east. The removal of trees from the project site, completion of grading and paving, and construction of the multifamily dwelling units would be visible from the adjacent residential parcels. However, as shown in Figure 2-4, Alternative A would maintain a minimum setback of 20 feet from the property line and would plant trees and shrubs along the boundary between the proposed project and the existing Grass Valley Terrace Apartments. This would provide some screening of the proposed project and would limit the degree to which views would change. Mitigation Measure 5a

includes several performance standards that the site landscaping must meet to ensure consistency with City requirements and avoid creating land use incompatibilities.

As discussed in Chapter 8, Transportation, Alternative A would result in increases in traffic congestion at several intersections in the area, as well as increase delay on the SR 20/49 off ramps. The project applicant would be required to make fair-share contributions to improvements at these locations, as described in Mitigation Measures 8a through 8g, to ensure traffic operations remain acceptable and thus the traffic generated by Alternative would not lead to any land use incompatibilities. Chapter 8 concludes that Alternative A would result in a significant and unavoidable impact due to the length of vehicle queues at the Dorsey Drive/SR 20/49 interchange. This is not considered a land use conflict and does not indicate a land use incompatibility because the traffic queues would not adversely affect the ability of individual property owners and renters to continue to utilize their properties.

Chapter 9, Noise, identifies that Alternative A could result in substantial increases in ambient noise levels in the project vicinity that would be mitigated to a less than significant level. This includes the potential for mechanical heating/air conditioning equipment at the proposed residential units to generate unacceptable noise levels at the existing apartments east of the site. Mitigation Measure 9c identifies performance standards that must be met by the mechanical equipment to ensure noise levels remain acceptable and this potential land use incompatibility is avoided. Alternative A would not result in a significant increase in traffic-related noise in the vicinity.

As demonstrated in Chapter 10, Air Quality, Alternative A would be expected to generate air pollutant emissions that exceed the Northern Sierra Air Quality Management District's thresholds during both construction and operation. These emissions could cause annoyance or adverse health effects for existing land uses in the vicinity. Mitigation Measure 10a requires that specific air pollution control measures be implemented throughout construction while Mitigation Measure 10b identifies minimum building and site design standards that must be met to help minimize air pollutant emissions. Implementation of these measures would reduce the amount of air pollutant emissions generated by Alternative A and ensure that no land use incompatibilities are created.

As discussed in Chapter 15, Hazards and Hazardous Materials, construction of Alternative A could release naturally occurring asbestos into the air, which would cause a land use incompatibility by exposing people at the existing commercial and residential developments in the vicinity to this hazardous material. Mitigation Measure 15a would ensure that the Removal Action Workplan for the project site is implemented correctly, including the dust abatement program included in the Workplan. This would ensure that naturally occurring asbestos is not released to the air and no land use incompatibility is created. Chapter 15 also demonstrates that none of the proposed land uses would be expected to use or store acutely hazardous materials or to use or store a volume of hazardous materials that could expose neighbors to substantial risk.

As summarized above, Alternative A could create incompatibilities with existing land uses in the vicinity resulting from changes in aesthetics, increases in traffic and noise, and exposure of adjacent populations to air pollutants and hazardous materials. However, with implementation of the mitigation measures identified above, this impact would be reduced to a **less-than-significant** level.

Alternative B

The project site is currently vacant (with the exception of residual foundations that correspond with the locations of previous mining features) and is adjacent to several residential communities. Development of the project site under Alternative B would not disrupt or divide any of the established communities in the vicinity.

The land in the project vicinity carries a mix of zoning districts, including light industrial, office/professional, single-family residential (R-1), medium density residential (R-2), and Multiple Dwelling Residential (R-3). The residential component of the project would consist of R-3, which allows for multifamily apartment buildings included as part of mixed-use projects. The proposed residential density within the project site is consistent with the range of densities for existing residential uses surrounding the project site (R-2A and R-3-MH). Further, the proposed residential density is consistent with the City's General Plan policies encouraging and accommodating multifamily development in areas of the City and higher residential densities on infill sites. The commercial and office components of Alternative B would not conflict with the existing light industrial (M-1) to the south and would be compatible with the C-2 zoned land north of the site beyond the existing residential area and southwest of the site on the western side of SR 20/49. Additionally, the mixed use and commercial plans are consistent with General Plan policies that encourage and facilitate mixed use developments on infill sites, promote jobs and employment opportunities, and encourage that opportunities for convenience goods and services be incorporated into development proposals.

Environmental resource areas that can indicate a potential for a project to be incompatible with existing land uses include those related to changes to the existing visual environment, increases in traffic volumes and congestion, increases in noise, air quality degradation, and exposure to hazardous materials. This analysis summarizes how these compatibility issues have been analyzed and addressed within the appropriate resource sections of this EIR.

Alternative B would not result in significant adverse visual impacts, as discussed in more detail in Chapter 5 Aesthetics. Although the changes on the project site would be visible from the adjacent multifamily residential development to the east, as shown in Figure 2-5, Alternative B Site Plan, Alternative B would maintain a minimum setback of 20 feet from the property line and would plant trees and shrubs along the boundary between the proposed project and the existing Grass Valley Terrace Apartments. This would provide some screening of the proposed project and would limit the

degree to which views would change. Mitigation Measure 5a includes several performance standards that the site landscaping must meet to ensure consistency with City requirements and avoid creating land use incompatibilities.

As discussed in Chapter 8, Transportation, Alternative B would result in increases in traffic congestion at two intersections in the area. Mitigation Measure 8a, 8b, and 8e require the project applicant to make fair-share contributions to improvements at these locations to ensure traffic operations remain acceptable and thus the traffic generated by Alternative B would not lead to any land use incompatibilities.

Chapter 9, Noise, identifies that Alternative B could result in substantial increases in ambient noise levels in the project vicinity that would be mitigated to a less than significant level. This includes the potential for mechanical heating/air conditioning equipment at the proposed residential units to generate unacceptable noise levels at the existing apartments east of the site. Mitigation Measure 9c identifies performance standards that must be met by the mechanical equipment to ensure noise levels remain acceptable and this potential land use incompatibility is avoided. Alternative B would not result in a significant increase in traffic-related noise in the vicinity.

As demonstrated in Chapter 10, Air Quality, Alternative B would be expected to generate air pollutant emissions that exceed the Northern Sierra Air Quality Management District's thresholds during both construction and operation. These emissions could cause annoyance or adverse health effects for existing land uses in the vicinity. Mitigation Measure 10a requires that specific air pollution control measures be implemented throughout construction while Mitigation Measure 10b identifies minimum building and site design standards that must be met to help minimize air pollutant emissions. Implementation of these measures would reduce the amount of air pollutant emissions generated by Alternative B and ensure that no land use incompatibilities are created.

As discussed in Chapter 15, Hazards and Hazardous Materials, construction of Alternative B could release naturally occurring asbestos into the air, which would cause a land use incompatibility by exposing people at the existing commercial and residential developments in the vicinity to this hazardous material. Mitigation Measure 15a would ensure that the Removal Action Workplan for the project site is implemented correctly, including the dust abatement program included in the Workplan. This would ensure that naturally occurring asbestos is not released to the air and no land use incompatibility is created. Chapter 15 also demonstrates that none of the proposed land uses would be expected to use or store acutely hazardous materials or to use or store a volume of hazardous materials that could expose neighbors to substantial risk.

As summarized above, Alternative B could create incompatibilities with existing land uses in the vicinity resulting from changes in aesthetics, increases in traffic and noise, and exposure of adjacent populations to air pollutants and hazardous materials. However, with implementation of the mitigation measures identified above, this impact would be reduced to a **less-than-significant** level.

3.4 MITIGATION MEASURES

No mitigation measures specific to land use are required. Implementation of mitigation measures identified in other environmental resource chapters would be necessary to ensure consistency with the General Plan and to avoid creation of land use incompatibilities.

3.5 REFERENCES CITED

Buxton. 2010. *Grass Valley, CA, Market Overview.*

Chabin Concepts. 2013. *Grass Valley Retail Focus Group Report*. June 2013.

City of Grass Valley. 1999. *City of Grass Valley 2020 General Plan*. Adopted November 1999.

City of Grass Valley. 2007. *City of Grass Valley Development Code.* March 6, 2007. Accessed at http://www.cityofgrassvalley.com/files/attachments/cdd/complete_development_code_2018_version_0.pdf

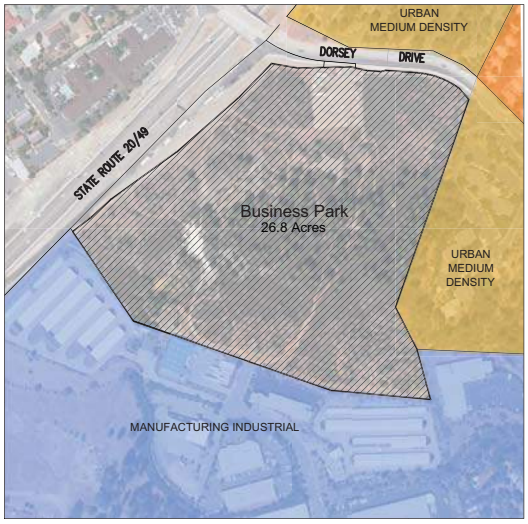
City of Grass Valley. 2011. *Economic Development Strategy.* January11, 2011.

County of Nevada. 2018. MyNeighborhood Geographic Information Systems base map. https://gis.nevcounty.net/myneighborhood/?APN=035260062. Accessed September 5, 2018.

DOC (Department of Conservation). 2016. *Nevada County Important Farmland 2014*. July 2016.

LEGEND:

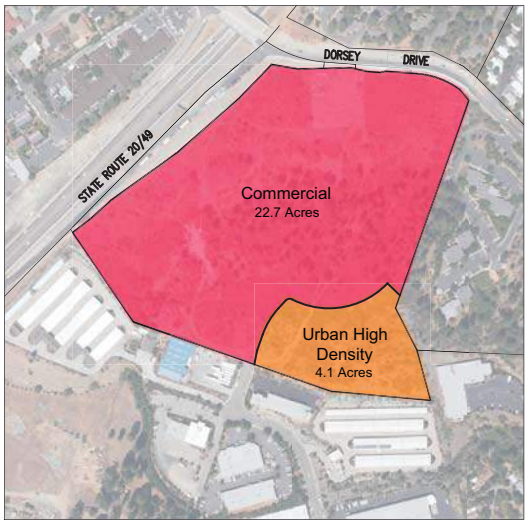
- BUSINESS PARK
- URBAN MEDIUM DENSITY
- URBAN HIGH DENSITY
- MANUFACTURING / INDUSTRIAL



EXISTING GENERAL PLAN

LEGEND:

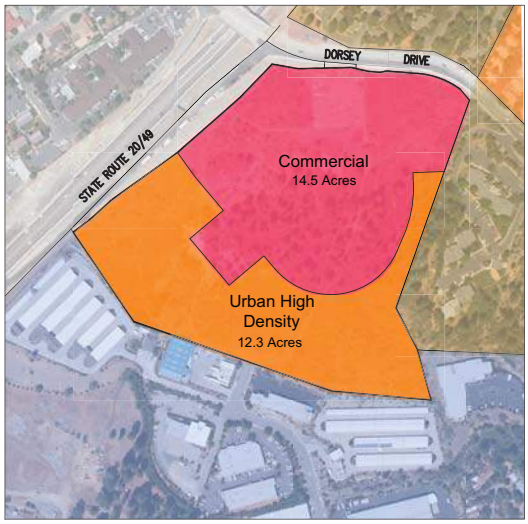
- COMMERCIAL
- URBAN HIGH DENSITY



PROPOSED GENERAL PLAN
ALTERNATIVE A

LEGEND:

- COMMERCIAL
- URBAN HIGH DENSITY

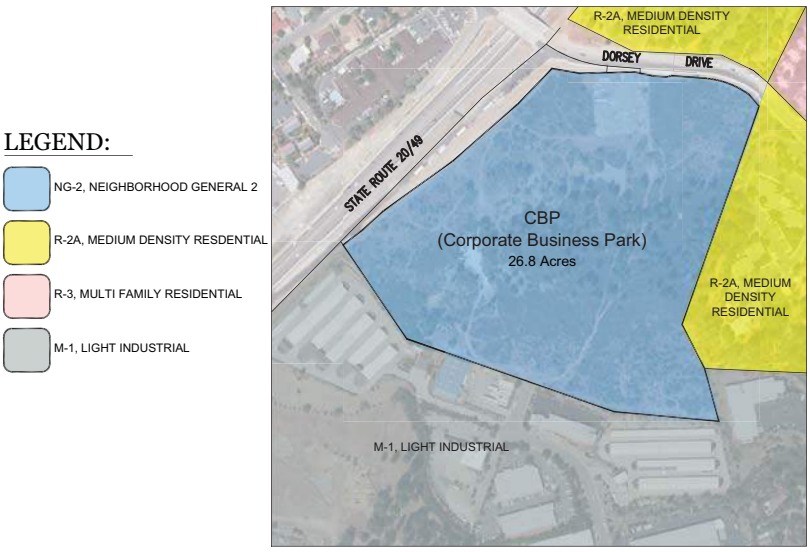


PROPOSED GENERAL PLAN
ALTERNATIVE B

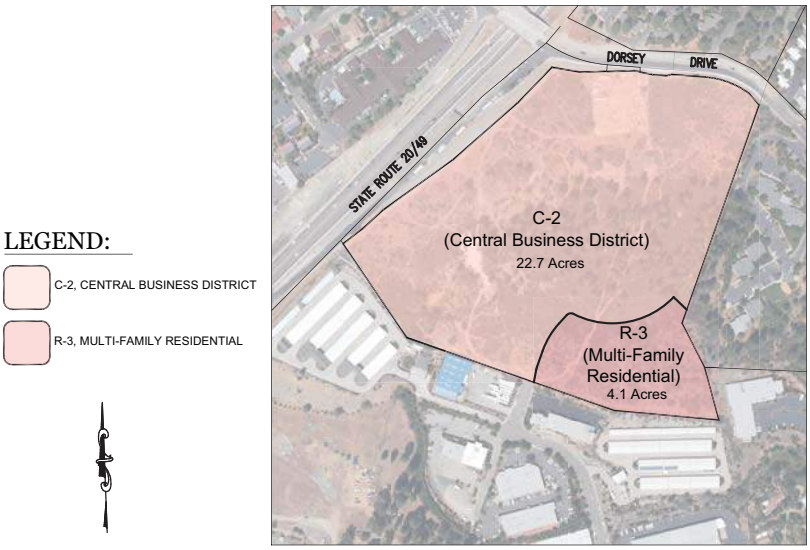
SOURCE: SCO 2019

FIGURE 3-1
General Plan Amendments
Dorsey Marketplace EIR

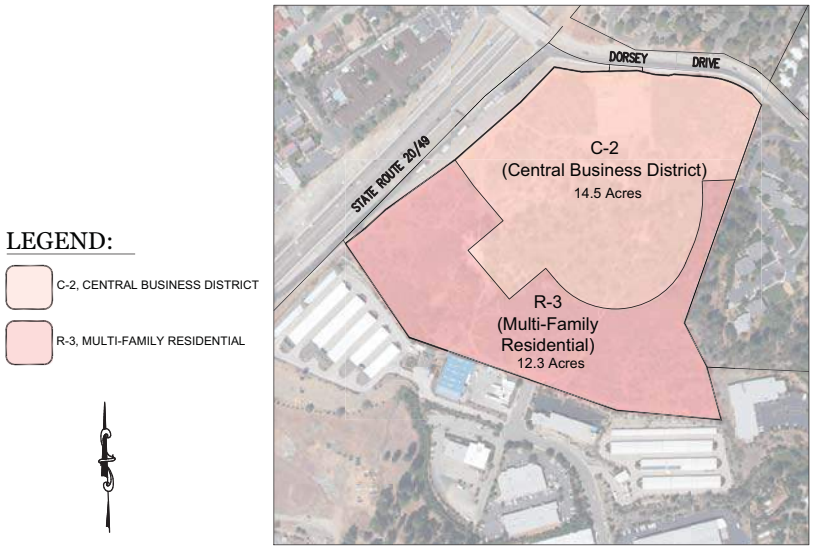
DUDEK



EXISTING ZONING



PROPOSED ZONING
ALTERNATIVE A



PROPOSED ZONING
ALTERNATIVE B

SOURCE: SCO 2019

DUDEK

FIGURE 3-2
Zoning Amendments
Dorsey Marketplace EIR

CHAPTER 4
POPULATION, EMPLOYMENT, AND HOUSING

This section of the Draft Environmental Impact Report (EIR) describes changes in population, employment, and housing associated with implementation of the proposed Dorsey Marketplace (proposed project) and evaluates whether those changes would result in significant environmental effects. Alternative A would provide for up to 90 multiple-family residential units and approximately 178,960 square feet of commercial space. Alternative B would provide ~~171~~ 172 apartments, approximately 104,350 square feet of commercial space, and approximately 8,500 square feet of office space.

Changes in population, employment, and housing in and of themselves are generally characterized as social and economic effects and are not considered physical effects on the environment. The California Environmental Quality Act (CEQA) provides that economic or social effects are not considered significant effects on the environment unless the social and/or economic changes are connected to physical environmental effects. A social or economic change related to a physical change may be considered in determining whether the physical change is significant (14 CCR 15382). The guidance for assessing economic and social effects is set forth in Section 15131(a) of the CEQA Guidelines:

> Economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.

While an increase in population resulting from new development does not necessarily cause direct adverse physical environmental effects, indirect physical environmental effects such as increased vehicle trips and associated increases in air pollutant emissions and noise could occur. The information in this section is used as a basis for the analysis of project impacts in the technical sections contained in this Draft EIR. No comments were received in response to the Notice of Preparation that addressed population, employment, and housing. The Notice of Preparation and comments received in response to it are provided in Appendix A.

4.1 ENVIRONMENTAL SETTING

Grass Valley serves as a regional and economic center for more than 70,000 people. The County seat, Nevada City, is located on the northern edge of the City and the two city centers are just 4.2 miles apart. After beginning as a mining and logging town, Grass Valley's economy includes a

diverse range of commercial businesses and offices, including recent and current growth in the medical and educational sectors.

Population

The population of the City of Grass Valley was estimated by the California Department of Finance to be 13,035 people in 2017 and 13,041 people in 2018 (California Department of Finance 2018a). As the area of the City is 5.45 square miles, this is equal to 2,392 people per square mile. This is far above the average for Nevada County, which is 103.1 people per square mile. The difference in population density reflects the more urbanized land use patterns in the City and the extent of large (several hundred acres) land holdings throughout the more rural areas of the County. Between April 2010 and April 2014, there was a 0.1% population increase at both the City and the County levels (City-Data 2017).

Household Size

As of the 2010 U.S. Census, there were 5,980 households within the City. By 2018, average number of people per household was 2.04; this is slightly lower the County average of 2.39 (California Department of Finance 2018a). Only 44% of housing is owner-occupied which indicates that the majority of residents rent (City of Grass Valley 2014).

Household Income

As reported in the City's General Plan Housing Element, the median household annual income (in 2014 dollars) was $33,325 (City of Grass Valley 2014). Additionally, the per capita income is $23,005. Within the City limits, there is a relatively high rate of poverty of 21.9%. This is much greater than the rate within the County, which is 11.4% and is much higher than the National rate of 14.8%. Additionally, 23.5% of the population is 65 or over, which is the full age of retirement as defined the U.S. Social Security Administration. This is compared to 19.4% in Nevada County and 14.0% nationally (City of Grass Valley 2014).

Housing Stock

A variety of housing types exist within the City, including single-family homes, multifamily homes, townhomes, and mobile or alternative style homes. Of these types, detached single-family homes and multifamily homes with 5+ units dominate the housing stock, with 46.7% and 31.5% respectively in 2012 (City of Grass Valley 2014). There are an estimated total of 2,981 detached single-family units within the City in 2018 (California Department of Finance 2018b). The City of Grass Valley contains 29% of the total housing stock in Nevada County (6,696 dwelling units in the City and 53,745 dwelling units in the County overall). Of these totals, Grass Valley contains 3,715

attached single-family and multifamily dwelling units while the County overall has as predominance of detached single-family units (California Department of Finance 2018b).

Residential Vacancy Rate

Residential vacancy rate for the City of Grass Valley increased between 2000 and 2012; for homeownership, it increased from 1.9% to 2.6% and for rentals, it increased from 2.5% to 7.3%. At the same time, however, the City has seen a large increase in overcrowding. In the same period, the rate of overcrowding, as defined by more than one person per room, more than tripled; in 2000, overcrowding increased from 8% of renters and 3% for homeowners to 21% and 11% respectively in 2011. In the 2014–2019 Housing Element, the City stated that, "The percentage of the population living in overcrowded conditions is an indicator of the continued poor economic conditions in California as a whole, particularly in the more rural areas" (City of Grass Valley 2014).

Housing Affordability

The General Plan EIR found that the City would accommodate anticipated increases in population by encouraging development of a variety of new housing types and designs and specifically that 45% "of new housing will be affordable, multifamily units. These multifamily developments will be scattered throughout the city, not concentrated in areas or neighborhoods. Infill development will respond to the higher percentage of seniors in the population" (City of Grass Valley 1999). As previously discussed, Grass Valley is home to a large percentage of renters and hosts a population that has seen in sharp increase in overcrowding. The City itself stated that such an increase in overcrowding is indicative of poor economic conditions. This, in conjunction with the high rates of poverty within the City, supports the need for additional affordable housing.

Employment

In 2014, the unemployment rate for the City of Grass Valley was 6.7% (City of Grass Valley 2014). This equates to approximately 380 working age persons seeking employment. This does not include, however, persons that are underemployed or that have stopped seeking work, which is one of the faults of the unemployment rate. This 6.7% is both lower than it was in 2009 (10%) and lower than Nevada County in 2014 (7.4%).

Commute Time to Work

The City of Grass Valley is both a bedroom community for those that work in the Sacramento Metropolitan Area and a center of employment for those in more rural areas of Nevada County. As much as 41% of Grass Valley residents commute to jobs outside of the City (City of Grass Valley 2014). The mean commute time for workers 16 and older, as of 2010, was 15.3 minutes whereas, for the County of Nevada, the mean travel time is 29.4 minutes.

4.2 REGULATORY FRAMEWORK

Federal and State Regulations

There are no federal or state requirements related to population, employment, and housing applicable to the project.

Local Regulations

City of Grass Valley 2020 General Plan

The Land Use, Conservation/Open Space, and Housing elements of the General Plan include the following goals (G), objectives (O), and policies (P) related to population, employment, and housing:

3-LUG: In areas of new development, plan for a diversity of land uses and housing types, including mixed use developments.

8-LUO: Provision of a full range of housing opportunities and types.

5-LUG: Provide for a broad range of housing opportunities, including opportunities for low, moderate and middle income households.

12-LUO: Designation of residential building sites sufficient in number and variety to meet projected demand.

6-LUG: Promote a jobs/housing balance within the Grass Valley region in order to facilitate pleasant, convenient and enjoyable working conditions for residents, including opportunities for short home to work journeys.

17-LUO: Future employment opportunities as adults for today's youth in well-paying local jobs.

7-LUG: Create a healthy economic base for the community, including increasing employment opportunities through attraction of new and compatible industry and commerce, and through retention, promotion and expansion of existing businesses.

19-LUO: Employment opportunities for present and future residents.

2-LUP: Require adequate information when reviewing development proposals, including full environmental review and fiscal impact analyses, to assure minimization of environmental, public facilities, and services impacts.

8-LUP: Encourage and facilitate mixed-use development on infill sites.

9-LUP: Provide for higher residential densities on infill sites and in the Downtown area.

14-LUP: Encourage incorporation of multiple family development in new development areas while maintaining high design standards.

23-LUP: Encourage mixed-use developments incorporating a variety of densities on infill sites and in areas proposed for annexation.

30-LUP: Encourage mixed use developments on larger parcels in newly developing areas incorporating jobs generating businesses industry housing.

6-CP: Locate transit stops and park and ride facilities near freeway interchanges and in conjunction with higher density residential and mixed-use developments.

3-COSP: Encourage clustering, density averaging, and other techniques in large-scale new developments, as means of preserving open space and natural systems.

In addition to the policies within the General Plan, the General Plan Housing Element identifies a coordinated and comprehensive strategy for promoting the production of safe, decent, and affordable housing within the community. The Housing Element is a 5-year plan for the 2014–2019 periods, which differs from other General Plan elements that cover the period of 1999–2020. The Housing Element serves as an integrated part of the General Plan, but state law requires updates every five years to ensure its relevancy and accuracy. According to state law, the Housing Element must provide an assessment of both current and future housing needs and constraints in meeting these needs, and provide a strategy that establishes housing goals, policies, and programs. The Housing Element identifies strategies and programs that focus on:

1. Matching housing supply with need;
2. Maximizing housing choice throughout the community;
3. Assisting in the provision of affordable housing;
4. Removing governmental and other constraints to housing investment; and
5. Promoting fair and equal housing opportunities.

A critical measure of compliance with the State Housing Element law is the ability of a jurisdiction to accommodate its share of the Regional Housing Needs Allocation (RHNA). The 2014–2019 Regional Housing Need Plan adopted by the Sierra Planning Organization allocated~~s~~ 530 housing units to the City of Grass Valley. In August 2019, the City adopted the 2019-2027 Housing Element which reflects an increased housing needs allocation of 745 units. Of the 743~~530~~ total units, 349~~220~~ units should be available to the above-moderate income category, 125~~00~~ should be available to the moderate income category, and 269~~10 of those units~~ should be affordable to low- and very low-income households. Grass Valley is not responsible for actual construction of these units. However,

Grass Valley is responsible for creating a regulatory environment that can accommodate these housing units (City of Grass Valley 20194).

4.3 IMPACTS

Methods of Analysis

As discussed previously, population growth is generally characterized as a social and economic effect and is not considered a physical effect on the environment. CEQA provides that economic or social effects are not considered significant effects on the environment unless the social and/or economic changes are connected to physical environmental effects.

Because the project's potential to cause population growth is analyzed in terms of the impacts of growth on the physical environment, this analysis focuses on whether the population growth attributed to the project would result in environmental effects not otherwise evaluated in this EIR. For example, a significant impact could occur if a project would cause growth beyond that which is anticipated for the area in which the project would be located, resulting in inadequate infrastructure to serve the area. Population growth associated with a project could also have a significant impact on the environment if that growth would occur in an undeveloped area that requires extensive infrastructure development and could promote future growth in that previously undeveloped area.

Significance Criteria

Potentially significant impacts associated with population and housing have been evaluated using the following criteria. Would the project cause a significant adverse change in the physical environment by:

- Inducing substantial 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)?
- Displacing substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?
- Displacing substantial numbers of people, necessitating the construction of replacement housing elsewhere?
- Reducing the affordable housing supply, impairing the Town's ability to meet its RHNA obligations, or creating a substantial increase in demand for affordable housing?

Impact Discussion

Impact 4-1: Would the project induce substantial population growth in the area?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A

Alternative A proposes to construct 90 units (20 one bedroom, 50 two bedroom, and 20 three bedroom). According to the City's Housing Element, the average household size is 2.04 whereas the average family size is 2.78. Based on the average household size, the proposed project would add approximately 184 people to the City.

According to the City's Housing Element, the population of Grass Valley increased by approximately 15% between 2000 and 2010, with an average annual growth rate of 1.5%. In 2010, the U.S. Census documented the population of Grass Valley as 12,860, which rose to 13,041 by 2018 (California Department of Finance 2018b). Implementation of the project would result in a total population of 13,225, a 1.41% increase over the 2018 population. Population growth since 2012 has been flat, with some years showing a slight (fewer than 30 people) increase and some years showing a slight decrease. Thus, to project population in the year 2020 (the year in which the project is assumed to be fully built out), the average annual growth rate identified in the Housing Element for the period between 2000 and 2010 was used. Thus, the City is estimated to have a population of 13,431 in 2020 without construction of Alternative A and 13,615 with construction of this alternative. Alternative A would represent the equivalent of a single year of population growth. Given the flat population growth since 2012, this slight increase in growth would not result in the City exceeding historic average growth rate or reaching a total population that is greater than the estimated population range in the City's General Plan, including the Housing Element. The population increases of approximately 1.5% do not represent substantial increases and would not result in significant impacts other than the environmental effects identified throughout this EIR (such as increasing traffic, generating air pollutants, and increasing public service/utility demands).

In addition to residential units, the project would involve construction of approximately 178,960 square feet of commercial building space, which is expected to primarily consist of restaurants and retail sales. According to the Dorsey Marketplace Economic Impact Analysis (Appendix D), the project would generate between 225 and 245 retail jobs at project buildout. Another ±30 jobs would be expected at full occupancy of the other commercial space. Property management and maintenance staff at the residential units could add another three jobs, bringing total project employment to between 260 and 280 jobs. It is assumed that workers who may be residents of the

project site, other areas within the city, or surrounding areas would fill these jobs. Alternative A would create a ratio of approximately 3 jobs for each dwelling unit.

Infrastructure improvements associated with the proposed project are discussed elsewhere in this Draft EIR, including Chapter 8, Transportation, and Chapter 14, Public Services and Utilities. The improvements primarily represent the project's infrastructure demands, which would be sized to accommodate the project and therefore would not support additional growth. As discussed in Chapter 2, Project Description, the project would be required to construct internal roads and on-site pipelines for potable water, stormwater drainage, and sewage conveyance to serve the proposed project. As the project consists of infill development, this infrastructure would only support the project and would not support additional development or growth outside of the city boundary. Additionally, commercial and residential infill development is consistent with the policies included in the City's General Plan, such as LUP-8, -9, and -23, which encourage and facilitate mixed-use development on fill sites and provide for higher residential densities on infill sites. As described in Chapter 3, Land Use, the project would require a General Plan Amendment to be consistent with the City's General Plan. This increase in population would result in an impact that is less than significant because the population growth expected from the proposed project would be consistent with the growth anticipated by and accounted for in the General Plan. The project would support the City's growth and economic development goals by generating new employment, shopping, and housing opportunities. Overall, impacts would be **less than significant**.

Alternative B

Alternative B proposes to construct ~~171~~ 172 units (38 one bedroom, ~~95~~ 96 two bedroom, and 38 three bedroom). Based on the average household size in the City of 2.04 people (City of Grass Valley 2014), Alternative B would add approximately ~~349~~ 351 people to the City.

Based on the year 2018 population of 13,041 people (California Department of Finance 2018b), construction of Alternative B would raise the City's population to 13,392~~0~~ people if it were fully built out immediately. This would be a 2.7% increase compared to the existing population. With the assumed population in 2020 of 13,431 in 2020 without construction of Alternative B, this alternative would lead to a total city-wide population of 13,782~~0~~. Given the relatively flat population growth in the City since 2012, this slight increase in growth would not result in the City exceeding historic average growth rates or reaching a total population that is greater than the estimated population range in the City's General Plan, including the Housing Element. The population increases of approximately 2.7% do not represent substantial increases and would not result in significant impacts other than the environmental effects identified throughout this EIR (such as increasing traffic, generating air pollutants, and increasing public service/utility demands).

In addition to residential units, the project would involve construction of approximately 104,350 square feet of commercial space and 8,500 square feet of office space. According to the Dorsey Marketplace Economic Impact Analysis (Appendix D), Alternative B would produce between 170 and 190 total jobs within the commercial, retail and office uses within the project site and including the potential for property management and maintenance staff at the residential units. There would be fewer total jobs than under Alternative A, but the office jobs would be likely to be at higher pay ranges than the commercial and retail jobs. It is assumed that workers who may be residents of the project site, other areas within the city, or surrounding areas would fill these jobs. Alternative B would create a ratio of approximately 1 job for each dwelling unit.

Infrastructure improvements associated with this alternative are discussed elsewhere in this Draft EIR, including Chapter 8 and Chapter 14. The improvements primarily represent the project's infrastructure demands, which would be sized to accommodate the project and, therefore, would not support additional growth. As discussed in Chapter 2, the project would be required to construct internal roads and construct internal roads and on-site pipelines for potable water, stormwater drainage, and sewage conveyance to serve the proposed project. As the project consists of infill development, this infrastructure would only support the project and would not support additional development or growth outside of the city boundary. Additionally, commercial, residential and office infill development is consistent with the policies included in the City's General Plan, such as LUP-8, -9, and -23, which encourage and facilitate mixed-use development on fill sites and provide for higher residential densities on infill sites. As described in Chapter 3, the project would require a General Plan Amendment to be consistent with the City's General Plan. This increase in population would result in an impact that is less than significant because the population growth expected from the proposed project would be consistent with the growth anticipated by and accounted for in the General Plan. The project would support the City's growth and economic development goals by generating new employment, shopping, and housing opportunities. Overall, impacts would be **less than significant**.

Impact 4-2: Would the project displace substantial numbers of existing housing and/or people, necessitating the construction of replacement housing elsewhere?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	No impact	No impact
Mitigation measures:	None required	None required
Significance after mitigation:	No impact	No impact

Alternative A and Alternative B

The project site is undeveloped and is not currently occupied; therefore, the proposed project would not remove or displace existing housing or people. Alternative A would construct 90 multifamily dwelling units while Alternative B would construct ~~171~~ 172 multifamily dwelling units; both

alternatives would increase housing at the project site. **No impact** would occur related to housing displacement.

Impact 4-3: Would the project reduce the affordable housing supply, impair the City's ability to meet its RHNA obligations, or create a substantial increase in demand for affordable housing?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A

The project site is undeveloped. No housing exists within the project site and no affordable housing would be demolished or otherwise removed from the City's affordable housing supply.

As discussed in Section 4.1, Environmental Setting, the City is required to allocate sufficient sites to accommodate 743~~530~~ housing units to satisfy the housing needs from 2019~~4~~ to 2027~~19~~. Of that total, 349~~220~~ units should be available to the above-moderate income category, 125~~00~~ should be available to the moderate income category, and 269~~10~~ of those units should be affordable to low- and very low-income categories (City of Grass Valley 2019~~4~~). The City of Grass Valley has a 21.9% poverty rate, which is higher than the neighboring Nevada County communities (City of Grass Valley 2014). Grass Valley is responsible for creating a regulatory environment that can accommodate these housing units (City of Grass Valley 2014). Per the Housing Element, sites zoned for nonresidential use that can be redeveloped for, and as necessary, rezoned for residential use may accommodate needed housing.

Alternative A proposes to provide 90 dwelling units consisting of 20 three-bedroom units, 50 two-bedroom units, and 20 one-bedroom units. The units would range in size from 1,013 to 1,600 square feet and all would be offered for rent at market-rates. These residences could satisfy a portion of the City's need for 125~~00~~ moderate and 349~~220~~ above-moderate-income housing units. The project would not contribute to filling the City's need for very low-income units but may contribute to the City's need for low-income units. As described in Chapter 3, the project would require a General Plan Amendment and rezone to change land currently designated for Business Park to Commercial and Residential Urban High Density, and a rezone from Corporate Business Park (CBP) to Commercial (C-2) and Multiple Dwelling Residential (R-3). The City has approved other similar zone changes: since 2003, the City has approved development of 229 dwelling units on 37 acres of non-residentially zoned land (City of Grass Valley 2014). With the amendment and rezone, the project would contribute towards filling the region's housing needs in a manner consistent with the Housing Element.

As discussed in Impact 4-1, Alternative A would provide a 3:1 jobs/housing balance; Alternative A would generate between 270 and 290 jobs within the project site. It is expected that these jobs would offer a variety of pay ranges, commensurate with the types of businesses that may locate at the site. While some of the individuals that work in the lower pay range jobs available at the project site may have incomes at the moderate and low ranges, it is not expected that the majority of the jobs generated on site would add to the City's demand for affordable housing. The proposed apartments may provide housing opportunities for some of the individuals that would work at the project site.

Because Alternative A would not reduce the City's affordable housing supply or create a substantial increase in demand for affordable housing, this project would result in **less-than-significant** impacts associated with affordable housing.

Alternative B

Alternative B proposes to provide ~~171~~ 172 dwelling units consisting of 38 three-bedroom units, ~~95~~ 96 two-bedroom units, and 38 one-bedroom units. All units would be market-rate and would range in size from 1,013 to 1,600 square feet. Like Alternative A, the residences constructed under Alternative B could satisfy a portion of the City's need for 125~~00~~ moderate and 349~~220~~ above-moderate-income housing units and may contribute to meeting the City's need for low-income units but would not contribute to filling the City's need for very low-income units.

Like Alternative A, this alternative would require a General Plan Amendment and rezone to change land currently designated for Business Park to Commercial and Residential Urban High Density, and a rezone from CBP to C-2 and R-3. The City has approved other similar zone changes: since 2003, the City has approved development of 229 dwelling units on 37 acres of non-residentially zoned land (City of Grass Valley 2014). With the amendment and rezone, Alternative B would contribute towards filling the region's housing needs in a manner consistent with the Housing Element.

As discussed in Impact 4-1, Alternative B would provide a 1:1 jobs/housing balance; Alternative B would generate between 170 and 190 total jobs within the commercial, retail and office uses within the project site. There would be fewer total jobs than under Alternative A, but the office jobs would be likely to be at higher pay ranges than the commercial and retail jobs. While some of the individuals that work in the lower pay range jobs available at the project site may have incomes at the moderate and low ranges, it is not expected that the majority of the jobs generated on site would add to the City's demand for affordable housing.

Because Alternative B would not reduce the City's affordable housing supply or create a substantial increase in demand for affordable housing, this project would result in **less-than-significant** impacts associated with affordable housing.

Impact 4-4: Would the project contribute to significant cumulative impacts associated with population, employment, and housing?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

The geographic range for assessing cumulative impacts associated with population and housing is the City of Grass Valley. Other past, present, and reasonably foreseeable projects within the City that could add to the City's population are identified in Table 3-1 of Chapter 3.

In addition to the 90 dwelling units included in the proposed project, the projects in the cumulative scenario could generate 529 dwelling units spread among several development sites, an additional 700 dwelling units under the Loma Rica Ranch Specific Plan, and 160 senior apartments. Based on the City's the average household size, these units could generate 2,833 new residents. The City's General Plan provides overarching guidance for development within City current and future limits, including planning for new residential and commercial land uses. The General Plan and Housing Element provide for development of a balanced land use pattern that meets the housing and economic development needs of the City's residents, including provision of a variety of housing types and prices. The General Plan EIR (City of Grass Valley 1999), found that the General Plan would increase the population by 7,395 people and accommodate up to 2,820 new residences between 1999 and 2020 to reach a total population of 23,395 in 2020. The plan also found that development would occur within the existing City boundaries and the City's Sphere of Influence, and development of roadways or infrastructure would occur within the planning area boundary. Additionally, the basic projections developed during the General Plan process for the 20-year planning period (to the Year 2020), including population, housing units, employment, and demands for land, indicate that less than full build-out would occur by the Year 2020. Therefore, the General Plan EIR viewed full buildout (beyond 2020) as the cumulative scenario. The EIR expected a total population of 26,299 at buildout, with an additional 807 housing units added from 2020 to buildout.

Actual growth has not occurred as quickly the General Plan EIR projected; thus, the City's population is well below the General Plan's estimates for 2020 and Plan Buildout. As discussed in Impact 4-1, the City's population growth has been relatively flat since 2012 and the current projected population in 2020 is 13,431. The addition of 184 people and 90 housing units under Alternative A or ~~171~~ 172 housing units and ~~349~~ 351 people under Alternative B would not exceed either the General Plan EIR's 2020 or Plan Buildout scenarios. Further, the dwelling units could contribute towards the City's attainment of its Regional Housing Needs Allocation targets for moderate and low income households. As described in the City's Housing Element the Regional

Housing Needs Allocation called for an additional 743~~530~~ housing units (City of Grass Valley 2019~~4~~). Implementation of the General Plan would ensure that housing needs are met and that environmental impacts associated with increased population are mitigated; therefore, impacts associated with population and housing in the cumulative condition would be **less than significant**. As such, there is no cumulative impact to which the project could contribute.

4.4 MITIGATION MEASURES

No mitigation measures are required.

4.5 REFERENCES CITED

California Department of Finance. 2018a. *Report E-1: Population Estimates for Cities, Counties, and the State January 1, 2017 and 2018*. May 1, 2018.

California Department of Finance. 2018b. *Report E-5: Population and Housing Estimates for Cities, Counties, and the State, January 1, 2011–2018, with 2010 Benchmark*. May 1, 2018.

City-Data. 2017. Grass Valley, California (CA) income map, earnings map, and wages data. Accessed at: http://www.citydata.com/income/incomeGrassValleyCalifornia.html. Accessed on February 24, 2017.

City of Grass Valley. 1999. *City of Grass Valley General Plan Update Environmental Impact Report*. Prepared for the City of Grass Valley by Quad Knopf. August 1999.

City of Grass Valley. 2014. *2014–2019 Housing Element*. September 2014.

City of Grass Valley. 2019. *2019-2027 Housing Element.* August 2019.

CHAPTER 5
AESTHETICS

This chapter identifies changes in the visual environment that would be experienced by existing off-site viewers with exposure to the proposed Dorsey Marketplace (proposed project) site. In addition, the analysis discusses the potential impacts of the development of the proposed project relative to visual compatibility with existing development and consistency with the City of Grass Valley (City) General Plan goals and policies related to aesthetics and design.

Information contained in this section is based on review of existing documentation, including the following:

- City of Grass Valley 2020 General Plan (City of Grass Valley 1999)
- City of Grass Valley Community Design Guidelines (City of Grass Valley 2010)

One comment was received in response to the Notice of Preparation (NOP) concerning aesthetic resources. The comment submitted by the Wolf Creek Community Alliance stated that existing trees and vegetation on the hilltop of the proposed project site are an important visual community resource, and emphasized the rarity of the site's McNab cypress. The NOP and comments received in response to the NOP are included in Appendix A.

5.1 EXISTING SETTING

Regional Landscape Setting

The approximately 27-acre project site is located in the City of Grass Valley in Nevada County. The project region is characterized with varied topography, from nearly flat areas to rolling hills to steep slopes. The project region also includes a wide range of land use intensity – from dense commercial and residential development in and surrounding the City of Grass Valley downtown and commercial centers like Brunswick basin, to more suburban levels of development in residential subdivisions located throughout the City, to more rural development in the outlying areas of the City and in unincorporated portions of Nevada County.

Local Landscape Setting

The project site was the former location of the Spring Hill Mine, which operated on the site intermittently during the late 1800s and through the 1940s (Appendix J-1). Remnants of the Spring Hill Mine are still evident on the project site primarily in the western and central portions of the site. The Spring Hill shaft is located in the central portion of the property and an additional capped shaft is located approximately 500 feet northeast of the Spring Hill shaft. A third, open shaft is located approximately 400 feet southwest of the Spring Hill shaft. Remnants of the bin foundation,

approximately 10 feet by 15 feet by 8 feet in height, are located between the Spring Hill shaft and the mill located to the southeast of the shaft. The mill foundation, approximately 50 feet by 75 feet, is present on site approximately 100 feet east of the remaining bin foundation. Piles of mine waste rock are present in the central and western portions of the site (Appendix J-1).

Rock outcrop is present at several locations in the western, northern, and eastern portions of the property. A large patch of mixed coniferous forest dominated by ponderosa pines (*Pinus ponderosa*) is located in the central portion of the project site. The southern portion of the project site consists of a mix of McNab cypress trees, whiteleaf manzanita, cottonwood forest and developed and disturbed land. The western boundary of the project site along State Route (SR) 20/49 is dominated by developed and disturbed land with whiteleaf manzanita and McNab cypress trees along the north eastern corner (Appendix E).

Land use designations under the General Plan for properties surrounding the project include Urban Medium Density Residential to the north and east, Manufacturing/Industrial to the south, and Office/Professional on the west side of SR 20/49 (City of Grass Valley 1999). The project site is boarded by SR 20/49 to the west and Dorsey Drive to the north. The Grass Valley Terrace Apartments are located east of the project site and further north beyond Dorsey Drive is the Springhill Garden Apartments. Gold Country Gymnasium and Bikram's Yoga are located southeast of the project site and three self-storage facilities (Old Barn Ernie's and Springhill) as well as Bub Enterprises Inc. are located to the south.

Sensitive Receptors: Key Viewpoints and Viewer Sensitivity

Viewers that may be sensitive to the proposed development are the residents in the existing single family homes, mobile homes, and multifamily apartments to the north and east of the project boundary; visitors to the Sierra Nevada Memorial Hospital and Golden Empire Nursing and Rehab Center, which are located directly west of the project boundary on the other side of SR 20/49; businesses to the south of the project boundary; and travelers along SR 20/49, directly west of the project site. This portion of SR 20/49 is not designated a scenic highway (Caltrans 2016); the views from this portion of highway are generally characterized by urban development. Visual sensitivity of the viewers is expected to be moderate overall, typical of residential receptors. There is a wide window in which relatively unconstrained views of the project site are available for travelers on SR 20/49 south of Dorsey Drive.

To describe the existing conditions in the area, four locations where publicly accessible views of the project site are available were selected for analysis, as shown on Figure 5-1, Key Viewpoint Locations.

Key Viewpoint 1: Looking North from Terminus of Spring Hill Drive

The viewpoint from Spring Hill Drive along the southern project boundary consists of grassland and interspersed woodland. This view is representative of the view for employees and visitors to the businesses along this road.

Key Viewpoint 2: Looking South from Dorsey Drive at Springhill Gardens Apartments

The viewpoint from Dorsey Drive is representative of the views from the existing residences in the Springhill Gardens Apartments, and is also similar to the views from the SR 20/49 on and off ramps intersection with Dorsey Drive. The view consists of the vacant and unvegetated area in the northern portion of the project site and a mixture of tall ponderosa pine woodland on the top of the hill, and low, open areas with shrubs. Views of SR 20/49 are to the southwest and views of wooded ridgelines are to the southeast.

Key Viewpoint 3: Looking East from SR 20/49 south of Dorsey Drive

The tops of trees within the project site are visible ~~The viewpoint~~ from northbound SR 20/49 from as far away as on-ramp from Idaho-Maryland Road. As vehicles approach~~ing~~ Dorsey Drive, views of the southwestern portion of the site are available in the midground, behind the public storage buildings adjacent to the site. At the base of the Dorsey Drive off-ramp, ~~and looking~~ eastward views over the project site consists of rooftops of industrial buildings and parking lots to the south of the project boundary, tall woodland on the slope of the project site's hill, and tree-covered ridgelines beyond the project site. The off-ramp to Dorsey Drive is higher in elevation and blocks the direct easterly view of the project site from SR 20/49, although the tops of the taller trees in the center of the project site are visible. On the off-ramp, the lower (southern) portion of the project site is more visible than from SR 20/49.

Key Viewpoint 4: Looking East from Terminus of Glasson Way

The viewpoint from the terminus of Glasson Way, where the Sierra Nevada Memorial Hospital is located, consists of clear views of woodland at the upper elevations of the project site sloping downhill to the lower elevations of the project site. Views of the ridgelines to the east are visible. This view is representative of what hospital visitors may see when looking east, and is also similar to views from other neighboring businesses on the west side of SR 20/49.

Viewpoints Considered but Rejected

The following viewpoints were considered but rejected because these locations do not offer unobstructed views of the project site or are not publicly accessible:

Key Viewpoint 5: Looking Southwest from Terminus of Grass Valley Terrace Apartments

The viewpoint is representative of the view from existing residences in Grass Valley Terrace Apartments. The view to the southwest from the apartment buildings consists of ponderosa pine woodland sloping uphill from the apartment complex, with the initial portion of trees and hillside located on the Grass Valley Terrace Apartments parcel. While views of the project site are possible from this location, this viewpoint is not publicly accessible, and thus is not appropriate for analysis in the EIR.

Key Viewpoint 6: Looking West from Grass Valley Senior Apartments on Dorsey Drive

The viewpoint from Grass Valley Senior Apartments on Dorsey Drive consists of the flat and largely unvegetated area in the northern portion of the project site as well as the trees and shrubs located along the eastern project boundary, with the ponderosa pine woodland vegetation visible in the mid-ground and views of tall trees located beyond the project site in the background. While views of the project site are possible from this location, this viewpoint is not publicly accessible, and thus is not appropriate for analysis in the EIR.

Viewpoint 7: Looking Northeast from 470 Idaho Maryland Road

The viewpoint from Caliber Collision, 470 Idaho Maryland Road, consists of open grassland gently sloping uphill, and industrial buildings associated with Old Barn Self Storage further up the hill, 175 Spring Hill Drive. The project site is not visible from Idaho Maryland Road. However, ponderosa pines on the project site are visible from further uphill on the Caliber Collision property.

Viewpoint 8: Looking Northwest from Idaho Maryland Road at Spring Hill Drive

The viewpoint from Idaho Maryland Road looking northwest along Spring Hill Drive consists of roadway and business park buildings, as well as some interspersed vegetation and landscaping. The tops of some of the ponderosa pines on the project site are visible, but the ground level portion of the project site is not visible from this location.

Viewpoint 9: Looking East from Southbound SR 20/49 north of Dorsey Drive

The viewpoint from southbound SR 20/49 looking southwest approaching the Dorsey Drive off-ramp consists of a brick highway barrier and tall trees. The highway increases in elevation as it approaches Dorsey Drive, and the project site remains screened from view.

Viewpoint 10: Looking East from Dorsey Drive at Comstock Court

The viewpoint along Dorsey Drive near Comstock Court consists of the Grass Valley Senior Apartments and Grass Valley Terrace Apartments and immediate vegetation. While the taller ponderosa pines on the project site are visible, the ground-level view of the project site is blocked. Additionally, the proposed project would grade the hill that supports the majority of the existing

ponderosa pines, and the proposed buildings would be lower and less visible than the tops of the existing trees. Because of the existing development visible from this viewpoint and immediate vegetation acting as a buffer, additional buildings at a distance would not constitute a substantial change in the visual landscape.

5.2 REGULATORY SETTING

Federal Regulations

No federal regulations pertaining to aesthetics are applicable to the proposed project.

State Regulations

California Department of Transportation Scenic Highway System

The California Department of Transportation (Caltrans) administers the state Scenic Highway Program to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways (California Streets and Highways Code, Section 260 et seq.). The state Scenic Highway Program includes a list of officially designated highways and highways that are eligible for designation. If a highway is listed as eligible for designation, it is part of the Scenic Highway Program, and care must be taken to preserve its eligibility status. The program encompasses the regulation of land use and density of development adjacent to scenic highways and includes other restrictions applicable to development within the scenic highway viewshed.

There is one officially designated highway and three eligible highways within Nevada County. The officially designated highway is SR 20 from post-mile 33.0 at Skillman Flat Campground to post-mile 39.1 0.50 miles east of Lowell Hill Road. One additional portion of SR 20 from SR 49 near Grass Valley (post-mile 12.2) to Interstate 80 near Emigrant Gap (post-mile 45.7) is eligible for listing. One portion of SR 174 from Bear River at the Placer city limits (post-mile 0.0) to the Grass Valley city limits (post-mile 10.2) is eligible for listing. One portion of SR 49 is eligible for designation from post-mile 15.1 at SR 20 near Nevada City to post-mile 47.5 at SR 89 near Sattley (Caltrans 2016).

Local Regulations

Grass Valley Community Design Guidelines

The City's Community Design Guidelines (City of Grass Valley 2010) specify layout and design, architectural treatments, and specific exterior materials and lighting guidelines to ensure that design is taken into consideration at the time development is proposed. The Community Design Guidelines are intended to provide a clear and common understanding of the City's expectations regarding aesthetic value and functionality of development while maintaining a balance between

accommodating growth, new development and revitalization, and preserving the natural assets and historical heritage of the City.

The design goals of the Community Design Guidelines include the following:

- Preserve and enhance the existing community while encouraging diversity through innovative, unique and creative design solutions and architectural styles.
- Conserve Community attributes that provide a sense of natural setting and continuity with the past by integrating the natural and built environment through preservation and enhancement of existing on-site natural features, historical or significant structures, views of the surrounding natural environment, neighborhood integrity, and design.
- Assure that new development is sensitive to and strengthens the existing built and natural environment.
- Create, maintain and enhance civic places through the emphasis of functional relationships and integration of the Community rather than the separation and barriers between adjacent development and uses.
- Foster development that supports a variety of transportation modes and facilitates pedestrian mobility, convenience, and safety.
- Balance aesthetic and functional considerations of design.
- Encourage designs, which result in the conservation and preservation of natural resources through the efficient use thereof.

The Design Guidelines present recommendations for several different types of development projects, including commercial and multi-family residential. The General Design Intent for commercial projects includes "to integrate the natural and built environment through preservation and enhancement of natural features of a site as an element within the overall design." The General Design Intent is supported by detailed guidelines for site planning and building placement, which include

d. Buildings shall be designed to take advantage of sunlight, existing circulation, natural landscaping, open space and attractive views such as prominent landmarks, historic buildings and the natural environment.

e. Buildings within commercial centers shall avoid "Linear Placement". This can be accomplished through varied setbacks, multi-building developments and vertical and horizontal façade articulation.

i. Development design should include preservation of natural site features, such as rock outcrops or large trees, to the extent feasible. Said resources should be incorporated into Development and public views of them should be maintained

The Community Design Guidelines also regulate setbacks, grading and hillside development, with a specific recommendation that "development design should include preservation of significant views of the natural ridge silhouettes."

Grass Valley 2020 General Plan

The project site is subject to policies set forth in the Grass Valley 2020 General Plan (Grass Valley 1999). As described in the Conservation Open Space (COS) element, the 1972 Grass Valley General Plan established parts of SR 20 and SR 49 as scenic highways, and their routes near and through Grass Valley were designated scenic corridors. The Grass Valley General Plan also recognizes that the main scenic resources in the city are the views available from many roadways to surrounding open space areas and vistas of the foothills and mountains, and that aesthetic qualities of hillsides and ridgelines should be protected. The 1982 General Plan reinforced previous scenic highway efforts through new policies and actions designed to enhance the City's "entryways" along SR 49 and SR 20. Those policies included strengthening entryway identity through landscaping, preserving and promoting the scenic quality of City streets, preserving and promoting visually pleasing arterials and highways, and regulate signs and billboards.

The COS element of the General Plan determines goals and objectives related to preservation and enhancement of natural resources and provides policies and implementation actions designed to achieve them. The following goals (G), objectives (O), and policy (P) are applicable to the proposed project.

4-COSG: Protect and enhance town entryways, visual corridors and important viewsheds including ridgelines.

11-COSO: Identification of particular corridors and views requiring protection or enhancement.

12-COSO: Identification of specific aesthetic considerations important to the protection and enhancement of particular corridors and views.

6-COSP: Prevent excessive alteration of the natural topography.

The Community Design (CD) Element of the General Plan concerns the built character, order and essence of the City. This element determines goals and objectives and provides policies and implementation actions related to preservation of historical and open spaces while accommodating

growth and revitalization. The following goals (G), objectives (O), and implementation action (I) are applicable to the project.

1-CDG: Preserve and enhance the existing community.

3-CDO: Recognition and protection of major views in the planning area, with particular attention to notable buildings, open space, hillsides, valleys, ridgelines, and forested views.

3-CDG: Assure that new development is sensitive to and strengthens the existing built and natural environment.

12-CDO: Creation of new development areas that are unique and interesting.

4-CDG: Create, maintain and enhance civic places.

17-CDO: Design of new development and infill projects that create a safe and visually interesting environment for the residents and visitors of Grass Valley.

10-CDI: Require shielding or downward direction of lighting and require that illumination be so arranged as to reflect away from adjoining properties.

City of Grass Valley Municipal Code

Sections 12.20.030 and 17.30.060 of the Municipal Code defines allowable heights and intensity for outdoor lighting, and provides light design guidelines (City of Grass Valley 2017, City of Grass Valley 2018).

5.3 IMPACTS

Methods of Analysis

The value attached to changes in visual character is largely subjective. This Draft EIR evaluates whether the project would result in a "substantial adverse effect" to existing scenic resources and the visual character of the site and surrounding area.

A description of the project site and the surrounding area was prepared based on site visits and review of aerial photographs. This EIR relies upon the City's General Plan to determine what visual elements have been deemed valuable by the community. The impact analysis focuses on the manner in which development could alter the visual elements or features defined as important visual resources by the General Plan that exist in or near the project site.

The project site does not contain any scenic vistas, is not a feature within any scenic vistas, is not designated as a visual resource in any City policy documents and is designated for urban development (as opposed to Open Space). Therefore, development of the project would have no

effect on any scenic vistas. In addition, there are no scenic highways in the vicinity of the project site and development of the project would have no effect related to damage to scenic resources visible from a state scenic highway. Therefore, these issues are not further addressed.

Significance Criteria

The significance criteria in the aesthetics section of Appendix G of the California Environmental Quality Act (CEQA) Guidelines were used to establish the criteria for determining whether the proposed project would have a significant environmental impact on existing visual resources (14 CCR 15000 et seq.). The project would have a significant impact on aesthetics if it would:

- Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings.
- Substantially degrade the existing visual character or quality of the project site and its surroundings.
- Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

Impact Analysis

Impact 5-1: Would the project substantially damage scenic resources, including but not limited to, trees, rocks, outcroppings, and historic buildings?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation Measure 5a	Mitigation Measure 5a
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

The City's General Plan includes objectives for the protection of major views in the planning area, including hillsides, ridgelines and forested areas. The project site is not located along a ridgeline, but does include a forested hillside area. Views of the ridgeline further east are available across the project site. Scenic resources present within the project site include areas of ponderosa pine and McNab cypress woodland, manzanita and other small shrubs, and small rock outcrops. Many of the trees within the ponderosa pine woodland are diseased and dying, as evident in the photographs of the project site provided in Figure 5-2a, Figure 5-2b, and Figure 5-2c, Existing Site Photographs. Alternative A and Alternative B would involve a similar area of disturbance within the project site and thus would result in the same impacts to scenic resources due to the tree removal necessary to construct either alternative.

Remnants of the Spring Hill mine are scattered primarily in the western and central portions of the site. The Spring Hill mine was determined not eligible for listing on either the California Register of Historic Resources or the National Register of Historic Places, thus it is not considered a historic resource (see Chapter 7, Cultural Resources). Further, the remnants consist of five concrete foundation features that do not provide any scenic qualities and they are not visible from offsite locations. Thus these are not considered a scenic resource. Under both Alternative A and Alternative B, the project proposes to remove the mine remnants as well as trees and other vegetation from the majority of the site to construct the proposed commercial and residential uses.

Impacts to the scenic resource provided by the existing tree canopy cover from ponderosa pines and McNab cypress woodland would occur in the short term after tree removal and as the project landscaping matures. The site supports 6.6 acres of ponderosa pine woodland, and 3.3 acres of McNab cypress woodland; these areas support moderately dense trees. In addition, there are approximately 60 trees outside of these woodland vegetation communities that are considered protected trees under the Grass Valley Tree Preservation Ordinance, as described in Chapter 6, Biological Resources. The majority of the trees on site would be removed in support of the excavation and soil remediation needed to address soil contamination and in support of construction of the proposed roads, parking, structures, and other site improvements necessary to support the proposed development. As required by the City's Tree Preservation Ordinance, the project would be required to plant either a one and one-half inch caliper healthy and well-branched deciduous tree or a five to six-foot tall evergreen tree for each tree removed. The proposed landscaping plans for both Alternative A and Alternative B demonstrate that all tree planting required under the Tree Preservation Ordinance would be accommodated within the project site. Although the Tree Preservation Ordinance allows for planting replacement trees off-site in locations approved by the City and/or paying the City's in-lieu fee for tree mitigation, it is not expected that either of these options would be necessary. To ensure that sufficient tree planting occurs within the project site to retain some of the scenic value provided by the existing trees on site, Mitigation Measure 5a reiterates the requirements of the Tree Preservation Ordinance to replace trees with onsite replanting of either a one and one-half inch caliper healthy and well-branched deciduous tree or a 5–6-foot-tall evergreen tree for each protected tree removed, in compliance with the City's Tree Preservation Ordinance. This may include planting individual McNab cypress and/or Fremont cottonwood trees. Refer to Chapter 6, Biological Resources, regarding the loss of the McNab cypress woodland and Fremont cottonwood vegetation communities within the project site. Mitigation Measure 6e requires that the project applicant provide compensation for the loss of McNab cypress woodland and cottonwood forest from the project site through a combination of on-site replanting and off-site restoration sufficient to ensure no net loss of habitat functions or values. To the degree that on-site replanting undertaken in implementation of Mitigation Measure 6e includes planting of individual trees that meet the size standards of Mitigation Measure 5a, those trees would also satisfy the requirements of Mitigation Measure 5a.

The project proposes to plant trees and other landscaping throughout the project site, as shown in Figures 5-3a and 5-3b, Conceptual Views. While the views in this figure reflect Alternative A, they are similar to the proposed landscaping and anticipated views under Alternative B. Trees and other landscaping would be planted along the project site frontage on Dorsey Drive, along the eastern project site boundary, and along the southern project site boundary. Landscaping would also be provided at both of the site entrances, throughout the parking lots, and along pedestrian zones. The proposed design includes a variety of deciduous ornamental, deciduous shade and coniferous trees, as well as shrubs, for the frontages of the project site. To ensure that the site landscaping provides sufficient and appropriate vegetation to provide for replacement of the existing scenic values provided by the on-site trees, Mitigation Measure 5a identifies performance standards that must be met by the final landscaping plans for the project site. This includes providing sufficient new trees to replace the removed trees consistent with the City's Tree Preservation Ordinance, providing trees and shrubs at the project site entrances from Dorsey Drive and Spring Hill Drive, dense tree planting along the southern, western, and eastern project boundaries, and planting sufficiently large canopy trees in the parking areas to provide 50% shade in 15 years in accordance with the Grass Valley Zoning Ordinance. Although the new trees may not reach the same height as the existing ponderosa pines, once mature, the project landscaping would provide a canopy cover similar to the canopy cover that exists in the surrounding environment. The project landscaping would not incorporate the existing small rock outcroppings, but these features are not visible from off-site locations.

Views to the ridgeline east of the project site would not be impeded by the proposed project. As described in Chapter 12, Geology, Soils, Seismicity, and Paleontology, the preliminary grading plan shows that up to 40 feet of cut is proposed in the central portion of the property and up to 60 feet of fill in the southwestern portion of the property. In the central portion of the site, the project would remove the existing knoll and associated trees. The rooflines of the proposed structures in this area would be generally the same elevation as the existing ground surface. Thus the structures would not block the background views of the ridgeline to the east. Although fill is proposed to be placed in the southwestern portion of the property, the proposed final ground elevation and structure rooflines would remain lower than the elevation of the existing knoll in the central portion of the site, thus these structures would not block the existing background views of the ridgelines to the east.

With compliance with the City's Tree Preservation Ordinance as demonstrated on the proposed landscaping plans and replacement of some of the vegetation lost to development through site landscaping (particularly around the perimeter of the site) in accordance with Mitigation Measure 5a, the project's impacts related to loss of or damage to scenic resources would be **less than significant**.

Impact 5-2: Would the project substantially degrade the existing visual character or quality of the project site and its surroundings?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation Measure 5a	Mitigation Measure 5a
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

The project site is an infill lot that is surrounded by development on all sides and the City of Grass Valley General Plan anticipates that the site would be developed to an urban level. Additionally, the property is not within a scenic highway corridor and does not provide any scenic vistas. The project site is located immediately to the south and west of existing apartment, mobile home, and single-family neighborhoods, north of existing light industrial buildings, and east of SR 20/49, as shown in Figure 2-3, Project Site, in Chapter 2, Project Description. As shown on Figures 5-2a through 5-2c, the project site currently consists of unimproved, previously disturbed open land with a mixture of woodland, low shrubs, and a large flat area surfaced with gravel along the project site's frontage on Dorsey Drive.

The project consists of infill among existing development within the City of Grass Valley. Under Alternative A, the project proposes to place two- and three-story apartment buildings in the southeastern corner of the site, bordering the existing apartment complexes along Dorsey Drive east of the project site, and to place commercial development in the northern and western portions of the site, bordering the industrial development to the south and SR 20/49 to the west. Under Alternative B, the project proposes the same residential uses in the southeastern corner of the site. It would develop a smaller commercial development across the northern portion of the site, and place two- and three-story buildings that support a mixture of office space and multifamily residential units in the southwestern corner of the site.

Physical compatibility of the project under both alternatives with surrounding and nearby land uses and properties is addressed more thoroughly within the appropriate resource sections of this Draft EIR (i.e., Land Use, Air Quality, Noise); this analysis considers the changes in the project site's visual character as observed from each of the four key viewpoints.

The proposed project would comply with the City's Design Standards, Construction Standards, and Standard Details, which address requirements such as setbacks, building heights, lot coverage, street design, and landscaping. The project plans include use of colors, materials, and accent features that reflect the history and current visual character of the City of Grass Valley, as shown on Figures 5-4 through 5-6, Alternative A Building Elevations 1, 2, and 3, and on Figures 5-7 through 5-9, Alternative B Building Elevations 1, 2, and 3, respectively.

Alternative A and Alternative B propose similar development intensity and design, and involve a similar area of disturbance during project construction. The primary change in the visual impact of the project between the two alternatives is in the southwestern corner of the site and along the western project site boundary. Views of each alternative from the four key viewpoints are described as follows and proposed elevations of the buildings that would be visible from the viewpoints are shown on Figures 5-4 through 5-9.

Key Viewpoint 1

Key Viewpoint 1 represents views from the terminus of Spring Hill Drive, where several industrial businesses are located. The views from this viewpoint consist of grassland and interspersed woodland, as shown on Figures 5-2b (southeast corner) and 5-2c (southwest corner).

Alternative A would replace the existing terrain in this viewshed with 90 apartment units in two- and three-story buildings, a 3,200-square-foot clubhouse, and three major commercial/retail tenant spaces, with "Major 4" being located nearest to this viewpoint. Elevations of this building as well as the apartment buildings are shown on Figure 5-4.

Alternative B would have similar development to Alternative A in the southeastern corner of the site, with 90 apartment units in two- and three-story buildings. The clubhouse would be placed on the western side of Spring Hill Road, and would be visible from this viewpoint. The development in the southwestern portion of the project site would consist of office spaces and more apartment units, again in a series of two- and three-story buildings, with apartment units facing south. Elevations of the buildings proposed for the southern portion of the project site under Alternative B are provided on Figure 5-7.

Under either alternative, the project would also construct infrastructure (including roads) and install landscaping within each project component and around the boundary of the project site. After project construction and once landscaping matures, views from this viewpoint would consist of a heavily landscaped entrance to the residential and commercial areas. Spring Hill Drive would be extended into the project site. The southwestern border of the site, to the left of Spring Hill Drive, would be screened with densely planted evergreen trees to screen the anchor buildings and service areas. Trees and landscaping would also be planted to the right of Spring Hill Drive. By replacing views of woodland and grassland habitat with residential and commercial/retail land uses, under either Alternative A or Alternative B, the project would result in a **potentially significant** change in the visual character of the site as seen from Key Viewpoint 1.

Key Viewpoint 2

Key Viewpoint 2 represents southerly views for travelers along Dorsey Drive. The view consists of an informal gravel parking lot, open disturbed land with low shrubs, with tall woodland in the

mid-ground. The existing conditions within the northern portion of the site are shown in Figure 5-2a. From some points along Dorsey Drive, southerly views across the project site include forested hills and ridgeline in the background. Views to the west are highly urban, consisting of SR 20/49 and dense office, health care, and residential development on the other side of the highway. The view to the project site looking south along Dorsey Drive near the eastern side of the project site would be replaced by a four-lane entrance to the project site and views of the four small commercial buildings, some of which may include drive-through service, near the site entrance. Further west along Dorsey Drive, southerly views under Alternative A would include the minor tenant commercial spaces proposed for the northwestern portion of the project site while views under Alternative B would include the northern façade of the Major stores proposed for the western portion of the site. Elevations of these buildings under Alternative A are provided in Figure 5-5 while elevations of these buildings under Alternative B are provided in Figure 5-8 The tall trees in the center of the site, which are visible from Dorsey Drive, would be removed and replaced with the proposed commercial land uses and associated landscaping. By replacing views of woodland and unimproved open area with landscaping and residential and commercial/retail land uses, the project would result in a **potentially significant** change in the visual character of the site as seen from Key Viewpoint 2.

Key Viewpoint 3

Key Viewpoint 3 is located along SR 20/49 south of Dorsey Drive. This is the view that drivers and passengers on SR 20/49 would see traveling either northbound or southbound, and while exiting northbound SR 20/49 onto the Dorsey Drive off-ramp. From northbound SR 20/49 approaching the Dorsey Drive off-ramp, drivers can see a clear view of the entire project site, including the rooftops of industrial buildings to the south of the project boundary, tall woodland sloping downhill on the project site, and tree-covered ridgelines beyond the project site. The off-ramp to Dorsey Drive is higher in elevation and blocks the direct easterly view of the project site from a small portion of SR 20/49, although the tops of the taller trees in the center of the project site are visible. The view from the off-ramp, at the higher elevation, provides expansive views of the project site, consisting mostly of open, disturbed land with low shrubs and tall woodland in the center of the site. Drivers on the off-ramp would also approach Dorsey Drive at slower speeds than if they were continuing north on SR 20/49, so drivers would be exposed to the view for more time.

Goals and objectives in the COS element of the General Plan require protection and enhancement of the town's entryways and ridgelines, and identification of aesthetic considerations important to the protection and enhancement of particular corridors and views. The project would be visible from SR 20/49. The existing view would be replaced with landscaping and trees bordering the perimeter of the site, the rear façade of the commercial buildings proposed near the western site boundary, and the front façade of commercial buildings proposed to be placed further east from the highway. Elevations of the buildings that would be visible from this viewpoint under Alternative A are

provided on Figure 5-6 while elevations of the buildings that would be visible from this viewpoint under Alternative B are provided on Figure 5-9. The tall trees in the center of the project site would be removed. The ridgelines to the east would still be visible. Buildings on the project site would be a maximum of three stories high, and would not obstruct views of the ridgelines to the east. However, by replacing views of woodland and open area with residential and commercial/retail land uses, the project would result in a **potentially significant** change in the visual character of the site as seen from Key Viewpoint 3.

Key Viewpoint 4

Key Viewpoint 4 is located at the terminus of Glasson Way near the Sierra Nevada Memorial Hospital. This viewpoint is representative of the view from the hospital and from other nearby buildings bordering the western side of SR 20/49. Foreground views in this area includes the highway, with the project site is the mid-ground. The view consists of clear views of woodland at the upper elevations of the project site sloping downhill to the lower elevations of the project site. The visual quality of the southwestern corner of the site is show on Figure 5-2c. Views of the ridgelines to the east are also visible from Key Viewpoint 4. This view would be replaced with landscaping and trees bordering the perimeter of the site, and commercial buildings to the east of that landscaping, similar to the views from Key Viewpoint 3. The ridgelines to the east would still be visible. By replacing views of woodland and open area with residential and commercial/retail land uses, the project would result in a **potentially significant** change in the visual character of the site as seen from Key Viewpoint 4.

Urban Decay

In addition to the key viewpoints, the project would have the potential to draw customers from other retail areas around the city, such as downtown, which could result in a degradation of visual character in the older retail areas. This potential is analyzed in Appendix D, Dorsey Marketplace Economic Analysis. With respect to Downtown Grass Valley, the analysis of retail sales trends highlights the strong and specialized character of that retail destination. The Economic Analysis found that sales activity downtown is more influenced by general economic conditions and factors affecting visitor travel and discretionary spending on entertainment and recreation. Development of the proposed project would not change the reasons for shopping and dining downtown. The report states that roughly $150 million in existing retail spending is spent outside of the western Nevada County market area (in the combined comparison and eating and drinking out categories). The report anticipates the proposed project could recapture some of that retail leakage spent outside of the county and would not depend on taking business from existing retail establishments in Grass Valley. Therefore, the proposed project would not be expected to decrease economic activity in downtown or other parts of Grass Valley and thus would not lead to urban decay associated with commercial buildings becoming vacant and owners deferring maintenance on such buildings.

Conclusion

In summary, the proposed project would alter the existing visual character of the project site by constructing residential and commercial development on land that is undeveloped. Construction of the proposed project under either Alternative A or Alternative B would result in a transition from views of previously disturbed, open land with patches of tall woodland and low shrubs to primarily developed uses and related infrastructure surrounded by landscaping. Implementation of Mitigation Measure 5a would ensure that some of the vegetation lost to development is replaced through site landscaping (particularly around the perimeter of the site). The proposed landscaping plan incorporates a variety of large shrub sizes to help achieve a strong buffer and uses evergreen shrubs and large deciduous accent shrubs to further develop a layered effect and provide year-round color and screening. Once matured, the perimeter landscaping would help screen views of the proposed development, while trees planted within the parking lots and along circulation routes would be visible between and over the tops of the proposed buildings. Additionally, the project architecture and design would comply with the City's Design Standards, which were developed to ensure compatibility with the existing character of the City of Grass Valley.

The project site is an infill development site surrounded by existing residential, office, transportation, and light industrial uses that has been anticipated for development in the City of Grass Valley General Plan. While the project would remove the visual resources currently supported on site, implementation of Mitigation Measure 5a would ensure that the project site retains some of the existing visual character and scenic quality by incorporating trees and layered landscapes, meets the City's landscaping and design standards, and is compatible with the existing character of the surrounding property. This would reduce the project's impacts to visual character to a **less-than-significant** level.

Impact 5-3: Would the project create a new source of substantial light or glare?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

Lighting is necessary to provide proper site visibility, guide movement at and around the site, provide security, emphasize signs, and enhance architectural and landscape features. Site lighting design considerations include mounting heights, light color, and shielding to focus lighting and avoid glare. Currently, there are streetlights surrounding the project site but there is no source of light or glare within the project site. Construction of the proposed project under either Alternative A or Alternative B would introduce the potential for light and glare from the project site to affect surrounding properties and roadways. Potential sources of light and glare associated with the project include

building lights, parking lot lights, car headlights, and any reflective building materials, including windows. Outdoor lighting sources create the greatest potential for light and glare impacts on adjacent properties. Removal of vegetation and trees, which can act as a natural shield, would also increase the potential for outdoor lighting to shine on adjacent property.

Direct glare is caused by a light source such as a light fixture or the sun. Sources of glare can also be surfaces that, after being illuminated by direct lighting or other indirect sources, have measurable luminance and, in turn, become light sources themselves. Potential sources of light and glare at nighttime include lights and structural building features made of glass, metallic, painted surfaces, and vehicles accessing the site. Commercial uses residences, parks, and all of the associated infrastructure and roads during non-daylight hours would emit light.

Under either Alternative A or Alternative B, the project's design includes fixtures that meet modern performance standards while maintaining consistency with the historical context of Grass Valley. Lighting fixtures adjacent to neighboring properties will use cut-off luminaries to mitigate light trespassing. All lighting, including height, streetlight, and luminaire design, would conform to Grass Valley Design Standards, the Community Design Guidelines, the Municipal Code, and the Community Design Element of the General Plan. Per the Community Design Guidelines, lighting fixtures should be thoughtfully placed to avoid light spillage and glare on adjacent properties, and lighting "spill over" shall not exceed 0.5 foot candles at any point on residential premises (City of Grass Valley 2010). Shielding or downward direction of lighting is required so that illumination reflects away from adjoining properties. As required by the City's Design Standards, all signals and street lights shall be powder coated black. Shielding shall be required on the mast arm side of all luminaires installed on the same side of the street as residential properties. Although the project is not in downtown Grass Valley, the City Engineer may require antique luminaire lamps or antique style street light poles (City of Grass Valley 2009). The Municipal Code states the exact location, type of pole, height of pole, type and size of luminaire, and fixture will be determined by the city engineer after consultation with the local utility company.

In the daytime, glare sources would come from building materials and vehicles accessing the site. The project does not propose to use highly reflective surfaces, such as mirrored glass or black glass. Further, the proposed site plan would place most of the new development away from existing public streets and screened by landscaping and trees. Buildings would be constructed with cement plaster in neutral earth tones which does not reflect glare, and metal siding which would incorporate low glare finishes. The Community Design Guidelines encourage design that incorporates the use of natural resources and that conserve community and historic attributes. Per the guidelines, all metal on buildings should be composed of low glare materials which will not result in off-site light glare or have an unfavorable appearance when viewed from surrounding areas (City of Grass Valley 2010). The guidelines also include requirements for setbacks, building heights, and grading. Adhering to these guidelines would ensure that glare from new light sources

at the project site would not adversely affect nighttime views or daytime safety. The potential for light and glare impacts would remain **less than significant** with compliance with the Grass Valley Design Standards, the Community Design Guidelines, the Municipal Code, and the Community Design Element of the General Plan.

Impact 5-4: Would the project contribute to cumulative impacts to the visual character of the region?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

The geographic scope for consideration of cumulative impacts to visual character is the City of Grass Valley. The reasonably foreseeable projects within the City are identified in Table 3-2 in Chapter 3, Land Use. Like many of the other projects in the cumulative scenario, the proposed project would develop an infill site that is surrounded by existing development. These projects reflect the objectives in the Grass Valley General Plan that encourage infill development as a way to limit sprawl and conserve land. The General Plan identifies this objective as an important strategy for maintaining the City's "small town rural character and sense of community while also fulfilling its destiny as the cultural and economic hub of western Nevada County" (City of Grass Valley 1999). There are several projects in the cumulative scenario that would involve greenfield development—which is development of vacant land at the edge of the existing City. For example, the Loma Rica Ranch Specific Plan anticipates development of 700 dwelling units on 450 acres along the eastern side of Grass Valley and the Southern Sphere of Influence Annexation and Planning Area would develop 416 acres at the southern end of the City. However, these greenfield development projects also include substantial amounts of open space – with 314 acres of open space in the Loma Rica Specific Plan and 117 acres of open space in the Southern Sphere area. Thus in the cumulative development scenario, the most scenic and important visual resources would be protected and the visual character of the City would be retained. Thus the cumulative impact to scenic resources and visual character would be less than significant.

The addition of multifamily residential and commercial land uses to the site under Alternative A and the addition of multifamily residential, commercial, and office land uses to the site under Alternative B would meet the City's goals to support infill development and would not result in a visual contrast to the existing surrounding development. The project would remove a patch of tall woodland on the project site, but implementation of Mitigation Measure 5a would ensure that this is replaced with landscaping that would enhance and visually screen the project once the trees and landscaping mature. By adhering to the Grass Valley Design Standards, the Community Design Guidelines, the Municipal Code, and the Community Design Element of the General Plan, the project's design

would be consistent with the City's desired visual character for new development. Thus the project's impact would remain **less than significant.**

As described in Appendix D, the Dorsey Marketplace Economic Analysis anticipates the proposed project and additional development planned for Western Nevada County would accommodate planned growth in the area and could recapture some of the retail leakage spent outside of the county. The report indicates the proposed project and other planned projects would not depend on taking business from existing retail establishments in Grass Valley, and would therefore not lead to degradation or widespread abandonment of existing businesses. Therefore, the proposed project would not contribute to substantial degradation of the existing visual character or quality of the area through urban decay effects.

5.4 MITIGATION MEASURES

Mitigation Measure 5a Final landscaping plans shall be approved by the City of Grass Valley Planning Division prior to issuance of any grading permits for the project site. The landscape plan shall be drawn to scale and shall show the locations of existing trees and plant material to be retained and the location and proposed design of landscaped areas and the varieties and sizes of plant materials to be planted. The final landscaping plans shall demonstrate compliance with the following standards:

- The trees proposed to be planted onsite shall include a minimum of either a one and one-half inch caliper healthy and well-branched deciduous tree or a 5–6-foot-tall evergreen tree for each protected tree removed, in compliance with the City's Tree Preservation Ordinance.
- Landscaping along the western, southern, and eastern site boundaries shall include a mixture of shrubs and trees spaced such that there is sufficient room for each plant to grow while also providing visual screening of large walls, loading docks, and parking areas. This may be accomplished with staggered meandering rows of planting that provide depth and natural variation in placement and plant materials/species. At a minimum, perimeter landscaping shall include species that typically reach heights at least as tall as the proposed buildings, and shall have sufficient quantities of vegetation such that at maturity, the vegetation will fully block sections of views that are at least 10 feet in length, spaced a minimum of 30 feet apart to a height of 8 feet. In the sections between those where views are fully blocked and at

heights greater than 8 feet, views of the development must be screened with varying amounts of landscaping.

- Loading and service areas for delivery or transfer of merchandise including vehicle access to those areas shall be screened from public view corridors and building entries by a combination of building design, layout, grade separations, masonry walls and dense landscaping.
- Site areas not used for buildings, parking or other designated functions shall be landscaped.
- All trees planted within the site shall be transplanted from five-gallon or larger size containers.
- Landscaped areas shall utilize predominantly low-maintenance, native and adaptive drought-tolerant plantings that conserve water and facilitate the use of drip irrigation.
- Landscaped areas shall use native trees and vegetation selected and placed to create a "natural forest" character in the landscape.
- Parking lot landscaping shall meet the requirements of the City of Grass Valley Municipal Code Section 17.34.030.
- The project site entrances at Dorsey Drive and Spring Hill Drive shall be landscaped with a mixture of ground cover, flowers, shrubs, and trees. At each entrance, landscaping shall be provided on both sides of the street and in median islands.
- Along the project site frontage on Dorsey Drive and along the on-site section of Spring Hill Drive, at least one street tree shall be properly installed for each 30-foot length of right-of-way and shall be maintained in compliance with the City of Grass Valley Municipal Code Section 17.34.140 (Maintenance of Landscape Areas). The review authority may modify this requirement depending on the chosen tree species and its typical spread at maturity.
- The project applicant shall post with the City of Grass Valley surety in the form of cash, letter of credit, performance bond, or instrument of credit, in an amount equal to 150% of the total value of all plant materials, irrigation, installation, and maintenance. Such surety shall be posted with the City for a 2-year period in compliance with Grass Valley Municipal Code Section 17.74.050 (Performance Guarantees).

- Prior to issuance of any certificates of occupancy for structures within the project site, the project applicant shall submit to the Planning Division a letter signed by a licensed landscape architect, or the landscape contractor who performed the installation certifying that the landscaping and irrigation for the project has been installed in compliance with the approved plans.

5.5 REFERENCES CITED

Caltrans (California Department of Transportation). 2016. Officially Designated State Scenic Highways And Historic Parkways. Accessed at: http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/. Accessed on May 17, 2016.

City of Grass Valley. 1999. *City of Grass Valley 2020 General Plan*. Adopted November 1999.

City of Grass Valley. 2010. *City of Grass Valley Community Design Guidelines*. Adopted February 26, 2002; Amended September 14, 2010.

City of Grass Valley. 2009. Construction Standards Section 9 Signals and Lighting. March 2009.

City of Grass Valley. 2017. City of Grass Valley Municipal Code, Code of Ordinances, Supplement 3. Amended September 26, 2017City of Grass Valley. 2018. City of Grass Valley Development Code. Adopted March 6, 2007. Amended April 24, 2018.

SOURCE: Bing 2018

DUDEK

0 150 300 Feet

FIGURE 5-1

Key Viewpoints

Dorsey Marketplace EIR

Northern portion of the site.

View to Dorsey Drive intersection across northern portion of the site.

Dudek 2016

FIGURE 5-2a

Existing Site Photographs

Dorsey Marketplace EIR

DUDEK

Southeastern corner of the site.

Existing vegetation along western site boundary.

Dudek 2016

FIGURE 5-2b

Existing Site Photographs

Dorsey Marketplace EIR

DUDEK

View to the south along eastern site boundary.

Project site southwestern corner.

Dudek 2016

FIGURE 5-2c

Existing Site Photographs

Dorsey Marketplace EIR

DUDEK

Aerial view

View from Dorsey Drive off-ramp

Williams + Paddon 2017

FIGURE 5-3a

Conceptual Views

Dorsey Marketplace EIR

DUDEK

Shops C and D, Dorsey

Major 1

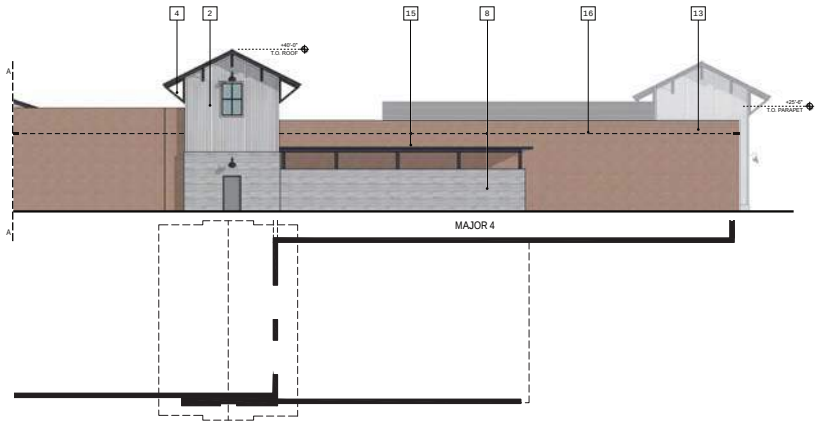
Williams + Paddon 2017

FIGURE 5-3b

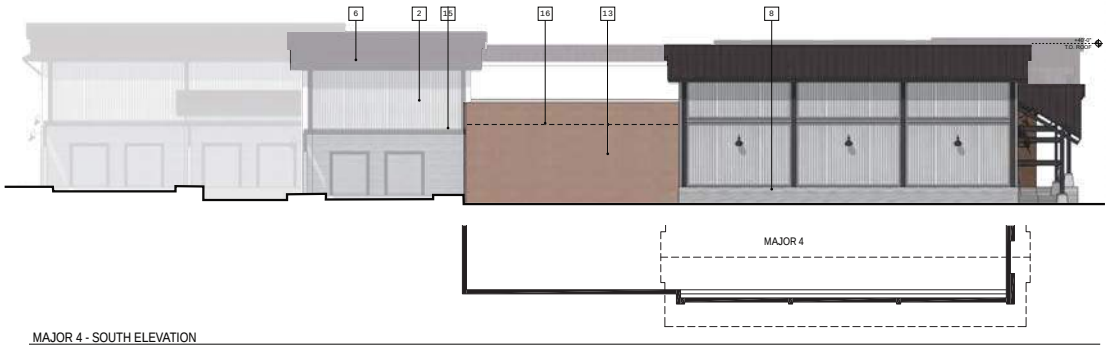
Conceptual Views

Dorsey Marketplace EIR

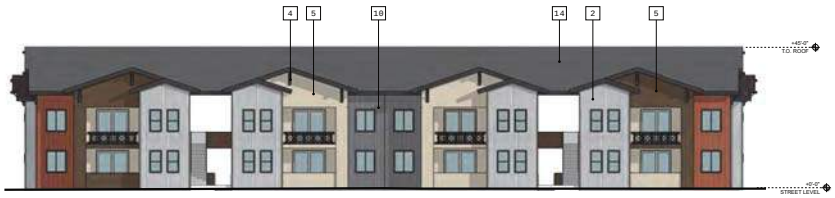
DUDEK



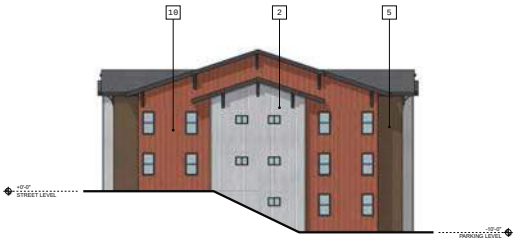
MAJOR 4 - WEST ELEVATION



MAJOR 4 - SOUTH ELEVATION



APARTMENT ELEVATION (2 BEDROOM UNITS) - FRONT

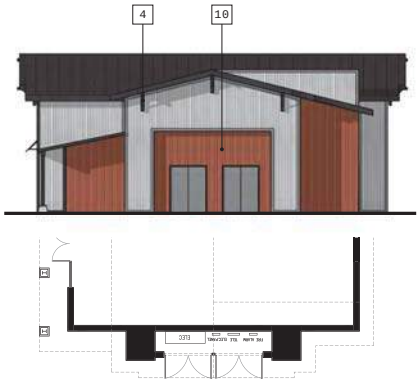


APARTMENT ELEVATION (2 BEDROOM UNITS) - SIDE

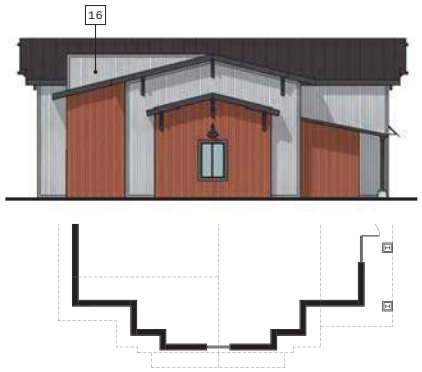
SOURCE: Williams + Paddon 2016

FIGURE 5-4
Alternative A Building Elevations 1
Dorsey Marketplace EIR

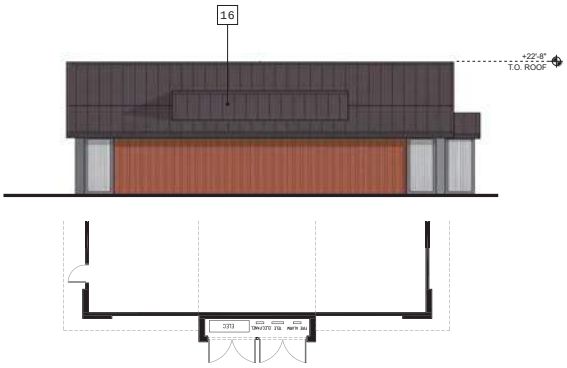
DUDEK



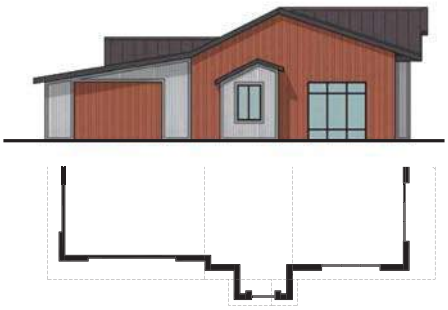
PAD 3 - EAST ELEVATION



PAD 3 - WEST ELEVATION



PAD 4 - NORTH ELEVATION



PAD 4 - WEST ELEVATION

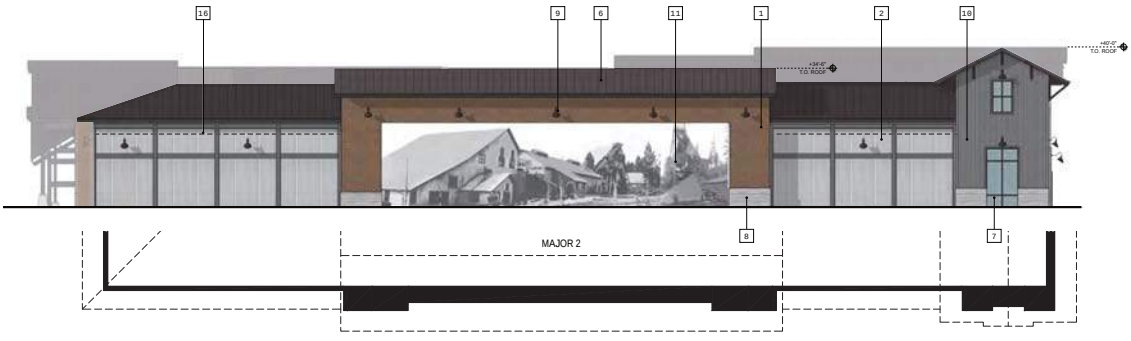
SOURCE: Williams + Paddon 2016

DUDEK

FIGURE 5-5
Alternative A Building Elevations 2
Dorsey Marketplace EIR

SHOP A & MAJOR 1 SOUTH ELEVATION

MAJOR 1, SHOP B, SHOP A, SHOP F - WEST ELEVATION

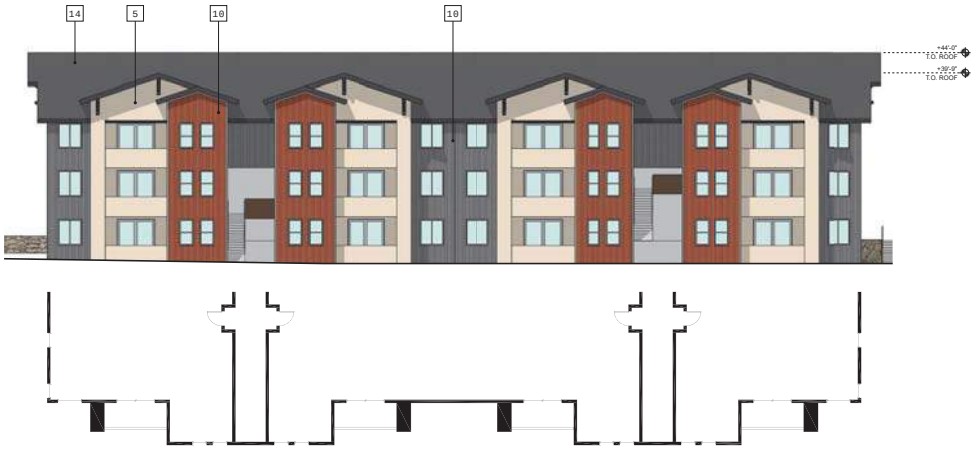


MAJOR 2 - NORTH ELEVATION

SOURCE: Williams + Paddon 2016

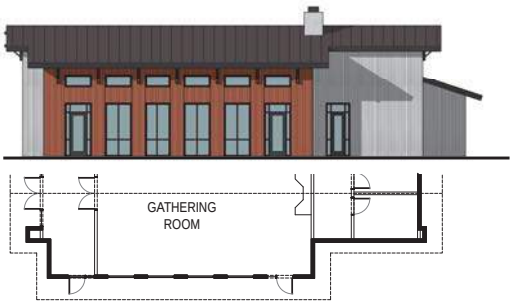
FIGURE 5-6
Alternative A Building Elevations 3
Dorsey Marketplace EIR

DUDEK

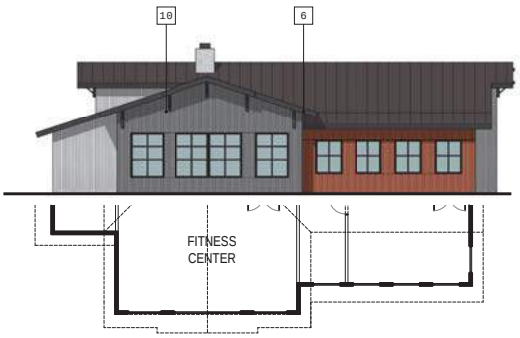


MIXED USE ELEVATION - BACK

APARTMENT ELEVATION (3 BED / 1 BED UNITS) - BACK



APARTMENT CLUBHOUSE - SOUTH ELEVATION

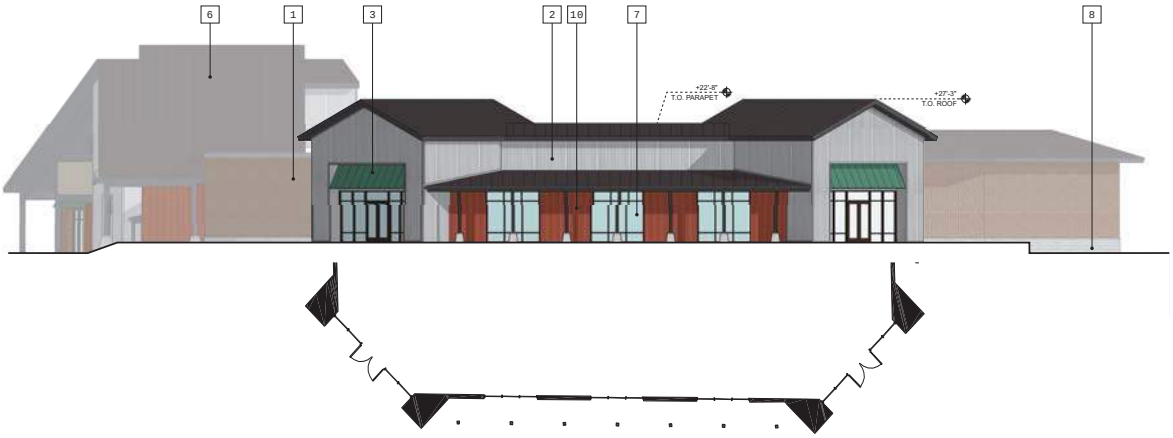


APARTMENT CLUBHOUSE - NORTH ELEVATION

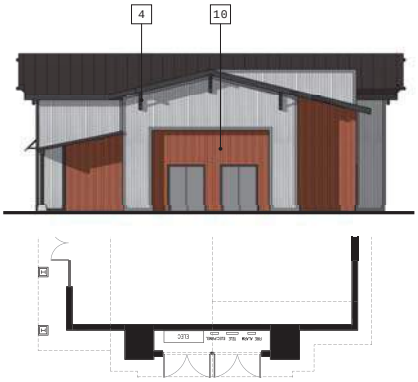
SOURCE: Williams + Paddon 2016

FIGURE 5-7
Alternative B Building Elevations 1
Dorsey Marketplace EIR

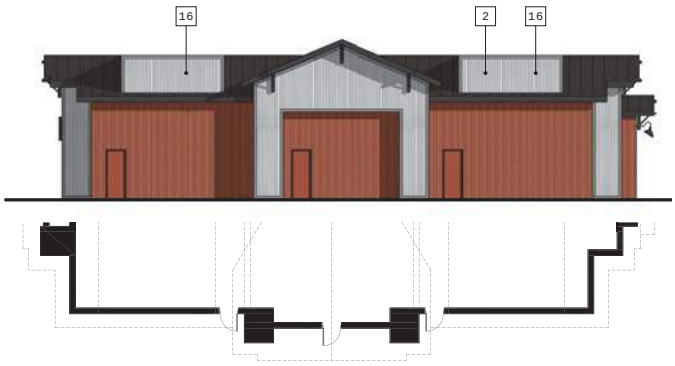
DUDEK



MAJOR - NORTH ELEVATION



PAD 3 - EAST ELEVATION

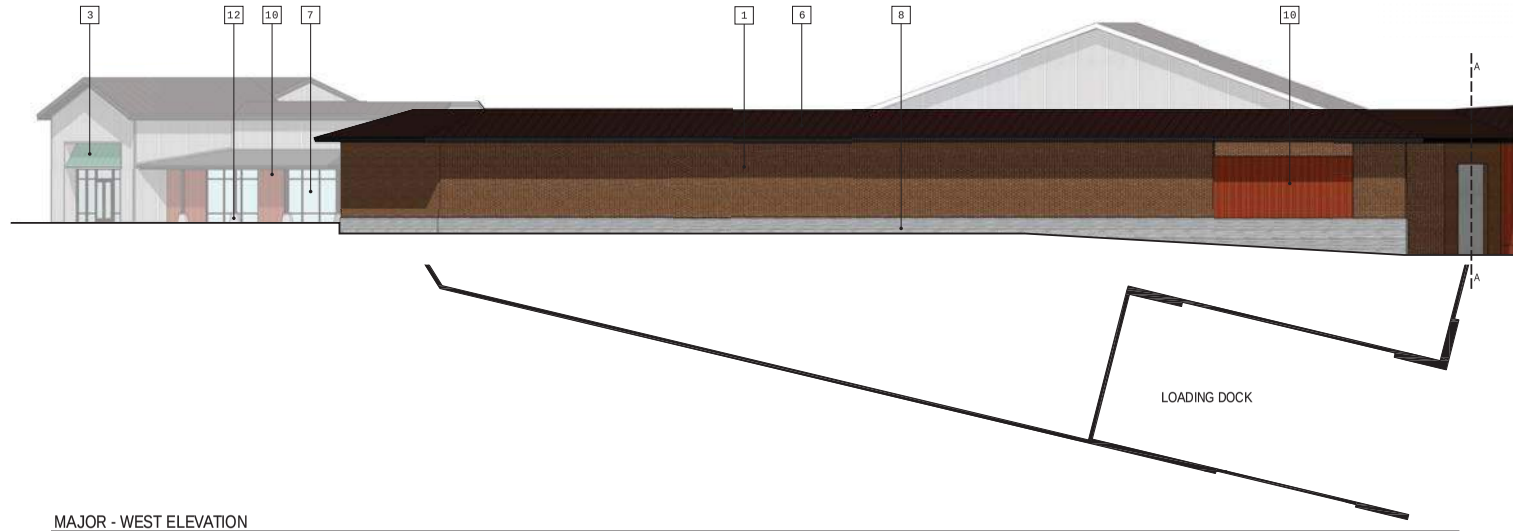


PAD 3 - NORTH ELEVATION

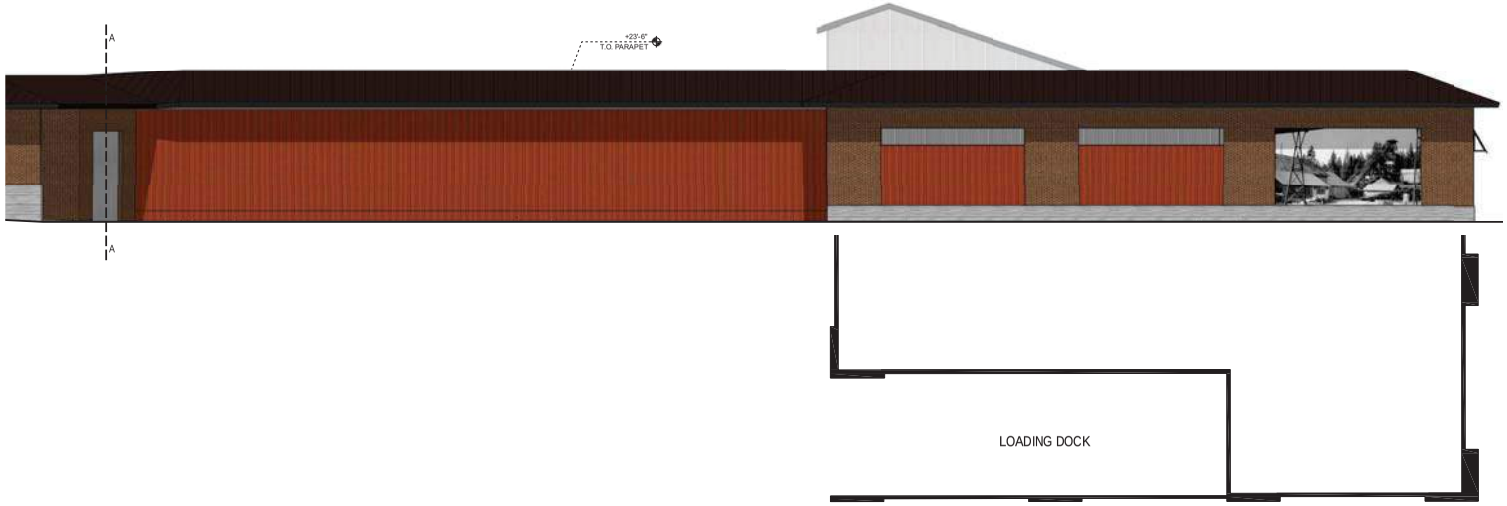
SOURCE: Williams + Paddon 2016

FIGURE 5-8
Alternative B Building Elevations 2
Dorsey Marketplace EIR

DUDEK



MAJOR - WEST ELEVATION



MAJOR - WEST ELEVATION

SOURCE: Williams + Paddon 2016

FIGURE 5-9

Alternative B Building Elevations 3

Dorsey Marketplace EIR

DUDEK

CHAPTER 6
BIOLOGICAL RESOURCES

This chapter evaluates the potential effects on biological resources associated with development and operation of the proposed Dorsey Marketplace (proposed project). Alternative A would provide for up to 90 apartment units, approximately 178,960 square feet of commercial space, and a 3,200-square-foot clubhouse. Alternative B would provide ~~171~~ 172 apartments, approximately 104,350 square feet of commercial space, approximately 8,500 square feet of office space, and a 3,200-square-foot clubhouse. This chapter describes the biological resources present within the project site; identifies special-status plant and wildlife species that are known to occur or potentially occur within the project site; outlines applicable federal, state, and regional regulations pertaining to protection of plant and wildlife species; evaluates potential project-specific impacts on biological resources; identifies mitigation measures to minimize these impacts; and evaluates the degree to which the project could contribute to cumulative impacts.

Information referenced to prepare this chapter includes:

- *City of Grass Valley 2020 General Plan* (City of Grass Valley 1999a)
- *City of Grass Valley General Plan Update Environmental Impact Report* (City of Grass Valley 1999b)
- *Grass Valley General Plan Background Report* (Quad Knopf 1998)
- *Biological Technical Report* (Appendix E)

One comment concerning biological resources was received in response to the Notice of Preparation (NOP). The comment from the Wolf Creek Community Alliance stated that existing trees and vegetation on the hilltop of the proposed project site are an important visual community resource, and emphasized the rarity of the site's McNab cypress stands which are limited in the City. Verbal comments provided at the Planning Commission hearing to receive comments on the NOP identified concerns regarding the removal of trees from the project site. The NOP and comments received in response to the NOP is provided in Appendix A.

6.1 ENVIRONMENTAL SETTING

Regional Setting

The project site lies within the western edge of the Sierra Nevada geomorphic province on the eastern edge of California's Great Central Valley. This region is a transition zone between the lower foothill elevations and the higher Sierra Nevada Mountains. Grass Valley has four main soil associations: central Grass valley and land to the east is located within the Josephine-Sites-Mariposa association; land to the northeast of central Grass Valley is located within the Secca-

Boomer association; land to the northwest of the City center is located within the Aiken-Cohasset association soils; and land southeast of the central city is located in the Boomer-Sites-Sobrante association (Quad Knopf 1998). Vegetation communities found in Grass Valley include a mosaic of herbaceous, shrub and tree dominated types as well as aquatic and developed types.

Local Setting

The 26.8-acre project site is located in the City of Grass Valley in Section 23, Township 16 North, and Range 8 East of the U.S. Geological Survey (USGS) Grass Valley 7.5-minute quadrangle. The project site is surrounded by development, bordered by State Route (SR) 20/49 to the west, Dorsey Drive to the north, the Old Barn and Ernie's Storage to the south and the Grass Valley Terrace Apartments to the east. The portion of the site bordering the corner of Dorsey Drive and SR 20/49 is relatively flat, but slopes downhill with elevations on the property ranging from 2,560 to 2,794 feet above mean sea level (MSL). The project site is the former location of the Spring Hill Mine, which operated on the site intermittently during the late 1800s and through the 1940s. Abandoned mine features located on the project site include excavations, pits, remnants of building foundations, stockpiles of mine waste rock, and dry tailings ponds.

Native topsoil on site generally consists of clay, gravelly clay, and sandy clay underlain by a layer of bedrock consisting of diabase and serpentine, which appears to be moderately to severely weathered. Soils on the project site are part of the ultramafic-mafic basement of the Lake Combie complex and are dominated by the Dubakella complex. According to the Natural Resources Conservation Service (Appendix E) the three soil types mapped within the site include placer diggings, rock outcrop Dubakella complex 5 to 50 percent slopes and sites loam 9 to 15 percent slopes. Generally, placer diggings are found where historic mining practices have altered the land and consist of numerous minor components. Rock outcrops-Dubakella complex soils consist of ultrabasic rock outcrops in Dubakella soils on hills and mountains, which are rocky, well-drained soils often containing serpentinite components. Sites loam soils consist of well-drained clay loams derived from metabasic residuum weathered from metasedimentary rock.

Vegetation Communities

The communities identified on the project site are broadly classified, whenever possible, into alliances and associations as described in *A Manual of California Vegetation* (Sawyer et al., 2009 as cited in Appendix E). Five land cover types exist on the project site. A majority of the site is composed of whiteleaf manzanita (*Arctostaphylos manzanita* ssp. *glaucescens)* chaparral and McNab cypress (*Hesperocyparis macnabiana*) woodland with smaller portions consisting of ponderosa pine (*Pinus ponderosa*) forest, Fremont cottonwood (*Populus fremonti*) woodland, and ruderal/developed lands (Appendix E). The distribution of these vegetation communities within

the project site is shown on Figure 6-1 and each community is described in further detail in the following paragraphs. Table 6-1 identifies the extent of each community within the site.

Table 6-1
Vegetation Communities and Vegetation Types

Alliance	Vegetation Type	Acres
Arctostaphylos viscida shrubland	California chaparral	11.10
(NA)	Developed	0.64
(NA)	Disturbed/Ruderal	4.94
Populous fremontii	Cottonwood forest	0.62
Pinus ponderosa forest	Mixed coniferous forest	6.25
Callitropsis macnabiana forest	McNabb Cypress Woodland	3.15
	Total	**26.80***

* Acreage total is off by 0.01 due to rounding

Whiteleaf Manzanita Chaparral

Chaparral communities are located throughout the site including: along the southern boundary adjacent to the existing Spring Hill Drive; along the northeastern boundary of the project site adjacent to the Grass Valley Terrace Apartments; in the tip of the southeastern corner; and along most of the western portion of the site. The whiteleaf manzanita chaparral on site is dominated in most areas by whiteleaf manzanita and in other areas is codominant in the canopy with scrub oaks (*Quercus berberidifolia and Q. durata)* and ceanothus (*Ceanothus cuneatus*) (Appendix E). The shrub canopy in the chaparral is dense and little vegetation grows under the shrubs. The few herbaceous species noted in the chaparral included bedstraw (*Galium aparine*). Openings in the chaparral were either barren or dominated by annual grasses and forbs.

McNab Cypress Woodland

McNab cypress woodlands are located in the northeastern corner adjacent to Dorsey Drive and in the southeastern corner. The overstory vegetation in both locations is dominated by McNab cypress with minimal herbaceous vegetation in the understory (Appendix E). This canopy is generally short (less than 20 feet in height) and either densely clustered or scattered with whiteleaf manzanita chaparral between trees. McNab cypress woodland is a fire-adapted species known to occur primarily on soils derived from basalt, conglomerate, gabbro, greenstone or serpentine substrates (Appendix E).

This vegetation community has a State rarity ranking of S3.2 and a global rarity rank of G3 (Appendix E). The State rarity rank of S3 indicates that there are 21 to 80 element occurrences, or 3,000 to 10,000 individuals, or 10,000 to 50,000 acres in California. The threat designation of .2 indicates that this species is fairly threatened in California, meaning between 20% and 80% of all

occurrences in the state are threatened. The global rarity rank of G3 indicates that there are 21 to 80 element occurrences, or 3,000 to 10,000 individuals, or 10,000 to 50,000 acres globally (Appendix E). Although the CNPS determined this species is threatened within the state, it is not listed as threatened, or protected, under the California Endangered Species Act.

Ponderosa Pine Forest

Ponderosa pine forests are located in the central portion of the project site extending to the eastern boundary adjacent to the Grass Valley Terrace Apartments. Ponderosa pine trees are the dominant plant in this vegetation community and trees on site are tall and well-spaced allowing for the growth of a sparse shrub layer in the understory (Appendix E). The shrub layer consists of ceanothus, whiteleaf manzanita, toyon (*Heteromeles arbutifolia*), and immature madrone trees (*Arbutus menziesii*) (Appendix E). Herbaceous vegetation in this community on site was sparse and consisted primarily of an unidentifiable lily. Many of the trees in the on-site ponderosa pine forest are diseased and dying.

Cottonwood Forest

One patch of cottonwood forest is located on the project site in the western portion along the southern boundary. This area is the lowest point on the property and it appears that water runoff from the hillside collects there; although no standing water was noted during the site surveys conducted by Dudek on March 4 and July 22, 2016 (Appendix E). Himalayan blackberry (*Rubus armeniacus*) is an associated species with this vegetation community (Appendix E).

Cottonwood forest has a State rarity ranking of S3.2 and a global rarity rank of G4 (Appendix E). As described previously, the state rarity rank of S3.2 indicates that this community is fairly threatened in California. The global rarity rank of G4 indicates that this species is apparently secure but factors still exist to cause some concern such as a somewhat narrow habitat (Appendix E).

Ruderal/Developed

Ruderal and developed land consists of a gravel parking lot and several cleared dirt access roads along the northern boundary of the site adjacent to Dorsey Drive extending south toward the center of the project site and historic mining facilities including cement foundations and mine tailing depressions in the western portion of the project site bordering SR 20/49 (Appendix E). Ruderal and developed lands are areas that have been altered through human disturbance and may support a variety of native and nonnative vegetation.

Sensitive Natural Communities

Sensitive natural communities are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. The General Plan EIR lists seven important biological resources areas within the City. These seven areas include: Scadden Flat Marsh located west of Grass Valley along SR 20 north of the Nevada County Fairgrounds; Hell's Half Acre located approximately 1.5 miles northwest of the City; Slate Creek Area adjacent to the southern boundary of Hell's Half Acre; Serpentine and Gabbro soil plant communities located north of Grass Valley near SR 20/49 along Dorsey Drive/Hughes Road; Union Hill Meadow located adjacent to Empire Mine State Historic Park; Wolf Creek which runs through the City; and Canadian Geese wintering habitat located southwest of the City on the 130 acre Conway Ranch (City of Grass Valley 1999a).

Two sensitive natural communities, as defined by the California Native Plant Society's Inventory of Rare and Endangered Plants occur within the project site. The McNab cypress woodland is ranked S3.2 and G3, as described above, and is known in the Sierra Nevada only from a few isolated stands in Butte, Yuba, Nevada and Amador counties (Appendix E). The cottonwood forest is ranked S3.2 and G4, as described above. The location and extent of the McNab cypress woodland and cottonwood forest within the project site is depicted in Figure 6-1.

Special-Status Plant and Animal Species

For the purposes of this EIR, special-status plant and animal species are defined as those species that fall into one or more of the following categories:

1. Officially listed or proposed for listing under the state and/or federal Endangered Species Acts.
2. State or federal candidate for possible listing.
3. Species meeting the criteria for listing, even if not currently included on any list, as described in Section 15380 of the California Environmental Quality Act (CEQA) Guidelines.
4. Protected under the Federal Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act.
5. Species considered by the California Department of Fish and Wildlife (CDFW) to be "Species of Special Concern."
6. Species that are biologically rare, very restricted in distribution, declining throughout their range, or have a critical, vulnerable stage in their life cycle that warrants monitoring.
7. Populations in California that may be on the periphery of a species' range, but are threatened with extirpation in California.

8. Species closely associated with habitat that is declining in California at an alarming rate (e.g., wetlands, riparian, old growth forests, desert aquatic systems, native grasslands, vernal pools).
9. Species designated as a special-status, sensitive, or declining species by other state or federal agencies, or non-governmental organizations.

The potential occurrence of special-status plant and animal species on the project site was initially evaluated by developing a list of special-status species that are known or have the potential to occur in the project vicinity. This list was derived from a review of the CDFW's California Natural Diversity Database (CNDDB), the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants, and the U.S. Fish and Wildlife Service (USFWS) lists of federal endangered and threatened species for the following USGS 7.5-minute quadrangles: Grass Valley, French Corral, Nevada City, North Bloomfield, Chicago Park, Rough and Ready, Wolf, Lake Combie and Colfax (Appendix E).

Special-Status Plant Species

Dudek staff biologist Laura Burris conducted ~~a~~ field surveys on March 4, 2016 and July 22, 2016 to analyze the project site and surrounding habitat for special-status plant species. All plant species encountered during the field survey were identified to the lowest taxonomic group possible and recorded directly into a field notebook. Based on review of the databases and other information sources 11 special-status plant species have the potential to occur on or in the vicinity of the project site. Of these, four were removed from consideration due to lack of suitable habitat within or adjacent to the project area, or the project site is outside of the species' known range (Appendix E). Four special-status plant species have low potential to occur on the project site due to lack of appropriate soil substrates or habitats on site (Appendix E). Three special-status plant species have moderate potential to occur at the project site based on consideration of the species soil requirements, typical vegetation associations, and range, as ~~and are~~ shown in Table 6-2 and discussed below. Although t~~T~~he site survey conducted by Dudek on March 4, 2016 was conducted at a time when special-status plants would not be evident and identifiable, special-status plants would have been evident and identifiable during the site survey conducted by Dudek on July 22, 2016. ~~, so~~ ~~n~~No special-status plant species were observed on the project site during ~~the~~ the July field survey, thus it is unlikely that any of the three species discussed below occur within the project site.

Table 6-2
Special-Status Plant Species with Potential to Occur

Scientific Name	Common Name	Status (Federal/State/CRPR)
Calystegia stebbinsii	Stebbins' morning-glory	FE/CE/1B.1
Monardella follettii	Follett's monardella	None/None/1B.2
Poa sierrae	Sierra blue grass	None/None/1B.3

Status Legend:
FE: Federally endangered, CE: California endangered
CRPR: California Rare Plant Rank 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere
.1 Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 Moderately endangered in California (20%–80% occurrences threatened/moderate degree and immediacy of threat)
.3 Not very endangered in California (less than 20% occurrences threatened or no current threats known)

Stebbins' morning-glory (*Calystegia stebbinsii*)

Stebbins' morning-glory is a low growing perennial herb that generally occurs on red clay soils of gabbro or serpentine origins. Stebbins' morning-glory maintains a dormant seed bank or rootstock that germinates following fires or other ecological disturbance that weakens the seed coat. Historically, Stebbins' morning-glory has been found in only two areas of El Dorado and Nevada counties and is listed as a federal and California endangered species, as well as having a California Rare Plant Rank (CRPR) of 1B.1 indicating that this species is seriously endangered in California (Appendix E). The chaparral and serpentine soil substrates on site may provide suitable habitat for this species however, this species has been documented in Nevada County only in association with chaparral containing chamise (*adenostoma fasciculatum),* manzanita (*Archtostaphylos* sp.), and foothill pine (*Pinus sabiniana)*. The nearest CNDDB documented occurrence for this species is located approximately 3.9 miles southwest of the project site (Appendix E).

Follett's monardella (*Monardella follettii*)

Follett's monardella is a perennial ~~herb~~ shrub that generally occurs in rocky mountain forests and slopes ~~and sometimes on~~with rocky, serpentine soils (Appendix E). Generally, Follett's monardella is found in Plumas and Nevada counties at elevations ranging from 1,969 to 6,562 feet above MSL and has a CRPR of 1B.2 indicating that it is moderately endangered in California.

Although the CNPS database indicates that this species has been documented in Nevada County, the nearest documented occurrence in the CNDDB is located more than 40 miles northeast of the project site (CDFW 2016). Montane coniferous forest onsite provides potentially suitable habitat for this species. ~~The rocky soils of the ponderosa pine forest on site may provide suitable habitat for this species.~~

Sierra blue grass (*Poa sierrae*)

Sierra blue grass is a perennial grass that generally occurs in shady moist slopes, on mossy rocks and in canyons and forests (Appendix E). Generally, sierra blue grass is found in Shasta, Plumas, Butte, Nevada, Placer and El Dorado counties at elevations ranging from 1,198 to 4,921 feet above MSL. ~~and~~ This species has a CRPR of 1B.3 indicating that it is not very endangered in California. The ~~ponderosa pine forest~~ montane woodland on site ~~may~~ provides potentially suitable habitat for this species.

Special-status Animal Species

Dudek staff biologist Laura Burris conducted a survey of the project site for special-status animal species. Survey techniques included binocular surveys of the property and perimeter, identification of potential habitat on site for special-status species and identification of wildlife based on sight, calls, tracks, scat or other signs. Based on review of the databases and other information sources, nine special-status animal species have been documented as occurring or potentially occurring in the vicinity of the project site. Of these species, seven were removed from consideration due to lack of suitable habitat within or adjacent to the site, or location of the site outside the species' known range (Appendix E). These seven species include California red-legged frog (*Rana draytonii*), foothill yellow-legged frog (*Rana boylii*), western pond turtle (*Actinemys marmorata*), California black rail (*Laterallus jamaicensis coturniculus*), Sierra Nevada red fox (*Vulpes vulpes necator*), west coast distinct population of fisher (*Pekania pennant*), and valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). No suitable aquatic or riparian habitat exists on site for California red-legged frog, foothill yellow-legged frog, California black rail, or western pond turtle (Appendix E). There is an extremely low possibility of California black rail to utilize the depression in the southwestern corner of the project site due to the depression's exposed nature and small size (Appendix E).

The remaining two species, Blainville's horned lizard (*Phrynosoma blainvillii*) and northern goshawk (*Accipiter gentilis*), were determined to have a low potential to occur on the project site based on the available habitat (Appendix E). The Biological Technical Report concluded that although openings in the chaparral habitat may provide potentially suitable habitat for Blainville's horned lizard, it is unlikely that this species would occur on the project site due to the lack of appropriate sandy soil substrates preferred by this species (Appendix E). This species was not observed within the project site during the March site assessment; however, the weather during the site visit was cold and rainy and this species may not have been very active under such conditions. Additionally, no Blainville's horned lizard individuals were observed within the project site during the July site assessment when the weather was more conducive to supporting activity by this species.

The Biological Technical Report also concluded that although northern goshawks are known to nest within ponderosa pine forests, it unlikely that this species would utilize the isolated stand on the project site for nesting since it is surrounded by development and highly degraded areas (Appendix E).

All raptor species found in California are protected by the California Fish and Game Code Section 3503.5 and some may use the site for nesting and foraging. Raptor species have the potential to nest on the site and forage adjacent to the site; however, due to its small size, the site does not provide substantially important habitat that would affect raptor species from continuing to exist within the area.

Aquatic Habitats and Jurisdictional Wetlands

Potentially jurisdictional waters and wetlands are regulated by the U.S. Army Corps of Engineers (ACOE) under Section 404 of the federal Clean Water Act, the Regional Water Quality Control Board (RWQCB) under Section 401 of the Clean Water Act and the Porter-Cologne Act, and CDFW under Section 1602 of the California Fish and Game Code. Pursuant to the federal Clean Water Act, ACOE jurisdictional areas include those supporting hydric soils, hydrology and hydrophytic vegetation. Areas regulated by the RWQCB are generally consistent with the ACOE criteria but may also include isolated features that have evidence of surface water inundation pursuant to the state Porter Cologne Act. Features are considered isolated through the lack of surface water hydrology and connectivity downstream but generally support at least one of the three ACOE wetlands indicators. CDFW regulated areas typically include those supporting a predominance of hydrophytic vegetation (i.e., 50 percent cover or greater) where associated with a stream channel.

The project site is located in the Upper Bear hydrological unit (HUC 18020126). Aquatic features on site include numerous erosional channels and one depression located at the southwestern end of the project site (Figure 6-2). In preparing the Biological Technical Report, Dudek conducted a constraints-level analysis for potentially jurisdictional waters and wetlands based on criteria provided by the following agencies:

- Waters of the U.S., including wetlands, under the jurisdiction of the U.S. Army Corps of Engineers (ACOE) pursuant to Section 404 of the federal Clean Water Act.
- Wetlands under the jurisdiction of the RWQCB pursuant to Section 401 of the Clean Water Act and the Porter-Cologne Act.
- Wetlands under the jurisdiction of CDFW, pursuant to Section 1602 of the California Fish and Game Code.

Based on historical aerial photos and visual inspection during the site visit, the Biological Technical Report completed for the project concluded that two of these features – the cement-lined ditch along the site's western boundary and the ephemeral drainage in the southwestern corner – are only periodically inundated and tend to remain inundated for short periods, depending on frequency and duration of rainfall events. However, the 0.065-acre seasonal wetland located south of the ephemeral drainage receives water from the ephemeral drainage and from the surrounding hillsides, then discharges this water to the adjacent 0.011-acre intermittent drainage (see Figure 6-2). The intermittent drainage ~~in the southwestern portion of the site~~ ties into an existing City of Grass Valley storm drain, which outfalls to Wolf Creek. Because the intermittent drainage is hydrologically connected to a waters of the United States, this feature is ~~also~~ likely to fall within the jurisdiction of the ACOE as a waters of the United States and the jurisdiction of the RWQCB and CDFW as a water of the state (Appendix E). The seasonal wetland is also considered likely to fall within the jurisdiction of the ACOE as a waters of the United States and the jurisdiction of the RWQCB as a water of the state.

Wildlife Corridors and Habitat Linkages

Wildlife corridors are natural areas interspersed within developed areas that provide avenues for the migration of animals. Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation; they may be continuous habitat or discrete habitat islands that function as stepping stones for wildlife dispersal. The project site is bounded on all sides by development and is not contiguous with any wildlife habitat or corridors (Appendix E). The site may provide important island habitat for birds and other wildlife adapted to urban environments.

6.2 REGULATORY FRAMEWORK

Federal Regulations

Federal Endangered Species Act

Projects that would result in impacts to federally listed threatened or endangered species are required to comply with the Federal Endangered Species Act (FESA), which is administered by USFWS. Section 9 of the FESA prohibits unauthorized take of listed species. "Take" is defined by the FESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The USFWS has further defined the terms "harass" and "harm." "Harassment" is defined as an act that "creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering." "Harm" is defined to include the following: "significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering."

The FESA defines "incidental take" as take that is incidental to, and not the purpose of, an otherwise lawful activity. Incidental take of listed species can be authorized by USFWS as long as the incidental take will not result in extinction of the species.

FESA compliance for projects that may affect federally listed species can be accomplished by federal agencies under Section 7 of the FESA or by private parties or non-federal agencies under Section 10 of the FESA. The objective under Section 7 of the FESA is to determine whether a federally funded or federally authorized project would adversely affect a listed species or designated critical habitat, and to identify measures necessary to reduce impacts to the species to an acceptable level. Section 10 of the FESA applies when there is no federal nexus, i.e., when no federal agencies are involved with the project. Different standards apply in the two different contexts. For example, under Section 7, the participating federal agencies must consider whether a proposed action could destroy or adversely modify critical habitat. This inquiry is not specifically required under Section 10.

Section 404 of the Clean Water Act

The ACOE and the U.S. Environmental Protection Agency (EPA) regulate the discharge of dredge and fill material into waters of the United States under Section 404 of the Clean Water Act. Waters of the United States are defined as "all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide." These include:

- All interstate waters including interstate wetlands;
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds;
- All impoundments of waters otherwise defined as waters of the United States under the definition;
- Tributaries of waters;
- Territorial seas; and
- Wetlands adjacent to waters (other than waters that are themselves wetlands).

The ACOE will typically exert jurisdiction over that portion of the project site that contains waters of the United States. This jurisdiction includes approximately the bank-to-bank portion of a creek up to the ordinary high water mark along its entire length, and adjacent wetland areas.

Section 401 of the Clean Water Act

The State Water Resources Control Board has authority over discharges of dredged or fill material into waters of the United States through Section 401 of the Clean Water Act, which requires that an applicant for a Section 404 permit also obtain certification from the appropriate state agency stating that the fill is consistent with the state's water quality standards and criteria. In California, the authority to either grant certification or waive the requirement for permits is delegated by the State Water Resources Control Board to the nine regional boards. The Central Valley Regional Water Quality Control Board is the appointed authority for Section 401 compliance in the project area. Once an application is filed with the ACOE, a request for certification or waiver must be submitted to the regional board. The regional board has 60 days to review the application and act on it. If a CEQA document is being prepared for the project requesting the certification, the CEQA document must first be certified before the regional board can issue the water quality certification. Because no ACOE permit is valid under the Clean Water Act unless certified by the state, these boards may effectively veto or add conditions to any ACOE permit.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (16 U.S.C., Section 703, Supplement I, 1989) regulates and prohibits taking, killing, possession of, or harm to migratory bird species listed in Title 50 of the Code of Federal Regulations, Section 10.13. This international treaty for the conservation and management of bird species that migrate through more than one country is enforced in the United States by the USFWS. Additionally, as discussed below, Section 3513 of the California Fish and Game Code states that it is unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act. This provides CDFW with enforcement authority for project-related impacts that would result in the take of bird species protected under the Migratory Bird Treaty Act. Hunting of specific migratory game birds is permitted under the regulations listed in Title 50 of the Code of Federal Regulations, Section 20. The Migratory Bird Treaty Act was amended in 1972 to include protection for migratory birds of prey (raptors).

State Regulations

California Endangered Species Act

The California Endangered Species Act (CESA), established under California Fish and Game Code Section 2050 et seq., identifies measures to ensure that endangered species and their habitats are conserved, protected, restored, and enhanced. The CESA restricts the take of plant and wildlife species listed by the state as endangered or threatened, as well as candidates for listing. Section 86 of the California Fish and Game Code defines "take" as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Under Section 2081(b) of the Fish and Game Code, CDFW has the authority to issue permits for incidental take for otherwise lawful activities. Under

this section, CDFW may authorize incidental take, but the take must be minimal and permittees must fully mitigate project impacts. CDFW cannot issue permits for projects that would jeopardize the continued existence of state listed species.

CDFW maintains lists for Candidate-Endangered Species and Candidate-Threatened Species. Candidate species and listed species are given equal protection under the law. CDFW also lists Species of Special Concern based on limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. Designation of Species of Special Concern is intended by the CDFW to be used as a management tool for consideration in future land use decisions; these species do not receive protection under the CESA or any section of the California Fish and Game Code, and do not necessarily meet CEQA Guidelines Section 15380 criteria as rare, threatened, endangered, or of other public concern (14 CCR 15000 et seq.). The determination of significance for California Species of Special Concern must be made on a case-by-case basis.

Section 2080.1 of the California Fish and Game Code stipulates that for persons obtaining incidental take statements or permits from the Department of the Interior (e.g., USFWS) for a federally listed species that is also state listed or a candidate for state listing, no further authorization or approval is necessary under CESA for that person to take that listed species if that person does both of the following:

1. Notifies CDFW in writing that the person has received an incidental take statement or an incidental take permit issued pursuant to the FESA; and
2. Includes in the notice to CDFW a copy of the incidental take statement or incidental take permit.

CDFW publishes receipt of the notice in the General Public Interest section of the California Regulatory Notice Register. Within 30 days of their receipt of the notice, CDFW determines whether the federal incidental take statement or incidental take permit is consistent with the requirements of CESA. If CDFW determines that the incidental take statement or incidental take permit is not consistent with CESA, then the taking of that species may only be authorized pursuant to California Fish and Game Code Section 2080 et seq.

Nesting Birds, Raptors, and Migratory Birds

California Fish and Game Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. California Fish and Game Code Section 3503.5 protects all birds of prey (raptors) and their eggs and nests, while Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act. These

regulations could require that vegetation removal or construction near nest trees be reduced or eliminated during critical periods of the nesting cycle unless surveys by a qualified biologist demonstrate that nests, eggs, or nesting birds will not be disturbed, subject to approval by CDFW and/or USFWS.

Fully Protected Species

Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code designate certain species as fully protected. Fully protected species, or parts thereof, may not be taken or possessed at any time, and no provision of the California Fish and Game Code or any other law may be construed to authorize the issuance of permits or licenses to take any fully protected species.

Streambed Alteration Agreements

Under Chapter 6 of the California Fish and Game Code, CDFW is responsible for the protection and conservation of the state's fish and wildlife resources. As amended effective January 1, 2004, California Fish and Game Code Sections 1600 through 1616 regulate activities by which a public or private entity proposes to "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake." Section 1600 et seq. of the code defines the responsibilities of CDFW and the requirements for public and private applicants to obtain an agreement for the activities referenced above. In general, a Streambed Alteration Agreement is necessary where any such proposed activity would "substantially adversely affect an existing fish or wildlife resource." The local CDFW warden or unit biologist typically has responsibility for issuing Streambed Alteration Agreements. These agreements usually include specific requirements related to construction techniques and remedial and compensatory measures to mitigate for adverse impacts. CDFW may also require long-term monitoring as part of an agreement to assess the effectiveness of the proposed mitigation.

California Native Plant Protection Act

The California Native Plant Protection Act (California Fish and Game Code Sections 1900-1913) and the Natural Communities Conservation Planning Act provide guidance on the preservation of plant resources. Vascular plants which have no designated status or protection under state or federal endangered species legislation, but are listed as rare or endangered by the CNPS, are defined as follows:

1. ~~List~~ Rank 1A: Plants presumed extinct

2. ~~List~~ Rank 1B: Plants rare, threatened or endangered in California and elsewhere
3. ~~List~~ Rank 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere
4. ~~List~~ Rank 3: Plants about which more information is needed – a review list
5. ~~List~~ Rank 4: Plants of limited distribution – a watch list

Plants on the CNPS ~~List~~ Rank 1A, 1B, or 2 are generally considered to meet the criteria for endangered, threatened, or rare species as outlined by Section 15380 of the CEQA Guidelines. These plants also meet the definition of Section 1901, Chapter 10 (Native Plant Protection Act) and Sections 2062 and 2067 (CESA) of the California Fish and Game Code. ~~Plants on the~~ Plants under the CNPS ~~List~~ Rank 3 ~~or~~ and 4 generally do not meet these criteria or definitions unless they meet one or more of the following: a) the project area is considered a type locality (i.e., the area from which the plant was originally described) for that species; b) populations are at the periphery of a species range; c) occurrences are in areas where taxon is especially uncommon or has sustained heavy losses; or d) populations exhibit unusual morphology or occur on unusual substrates.

Local Regulations

Grass Valley General Plan

The Conservation and Open Space Element of the Grass Valley General Plan (City of Grass Valley 1999b) identifies a goal of balancing considerations related to land use development and the natural environment to protect and properly utilize Grass Valley's sensitive environmental areas/features, natural resources and open space lands. This element also identifies a series of objectives (COSO), policies (COSP), and implementation measures related to the protection of open space and the conservation, development and utilization of natural resources. The following objectives and policies are applicable to the proposed project:

3-COSO: Protection of rare and endangered animals and plants.

4-COSO: Reduction of urban development impacts on native vegetation, wildlife and topography.

3-COSG:Ensure the protection of Grass Valley's trees and forested areas.

5-COSO:Encouragement of wildlife through habitat protection.

6-COSO: Assurance of appropriate resource conservation and environmental protection measures as prerequisites to development.

9-COSO: Identification of heritage trees for special recognition and protection.

10-COSO: Identification of significant groves and groupings of trees for permanent open space designation.

3-COSP: Encourage clustering, density averaging, and other techniques in larger-scale new developments, as means of preserving open space and natural systems.

4-COSP: Establish standards for inclusion and management of permanent open space in new developments.

12-COSP: Enhance the City's tree ordinance addressing tree maintenance and protection both within new developments and elsewhere in the City.

Tree Protection and Preservation Ordinance

The City of Grass Valley Tree Protection and Preservation Ordinance is found in Chapter 12.36 of the City's Municipal Code. The ordinance requires permits for the removal of protected trees and mitigation consisting of replanting on or off-site of a minimum of one and one-half inch caliper healthy and well-branched deciduous tree or a five to six-foot tall evergreen tree for each removed tree (City of Grass Valley 2011). Protected trees fall into four categories: trees with a trunk of ten caliper inches or larger in diameter at breast height (DBH); significant trees which measure 24 caliper inches or larger in DBH; heritage trees which are trees listed on the official City of Grass Valley heritage tree list adopted by the City Council due to distinct form, size, age, location, species, unique qualities or historical significance; and street trees located within the public right-of-way (City of Grass Valley 2011).

6.3 IMPACTS

Methods of Analysis

The project setting was developed by reviewing available information on special-status species and sensitive habitats known to occur in the project vicinity. This review was supplemented with a field survey to determine which of these species occurs on site or whether potential habitat for these species is present on the proposed project site. ~~A f~~Field visits ~~was~~ were conducted by Dudek biologist Laura Burris on March 4, 2016 and July 22, 2016, and a follow-up evaluation of potential wetland resources was conducted by Dudek biologists Laura Burris and Tera Stoddard on July 27, 2016. These assessments form the basis of the Biological Technical Report found in Appendix E.

CEQA requires that projects analyze the potential impacts on special-status plant and animal species, as well as on sensitive habitats, wildlife corridors, and waters of the United States. For the purposes of this EIR, impacts on wildlife species that are not considered special status are generally not considered significant unless impacts are associated with the species' migration routes or movements, or the species are considered locally important. In the region of the project site, deer or other common species

(e.g., skunk, raccoon, opossum, and coyote) would not be considered special-status species; however, potential adverse effects on their movements and migration routes must be evaluated. Regardless of status, all nesting native bird species are protected from harm under the California Fish and Game Code and the federal Migratory Bird Treaty Act.

The geographic context for the analysis of cumulative biological impacts includes the areas contained within the Sierra Foothills, but primarily focused on the area within the City limits. Present and probable future projects within the region as discussed in Chapter 3, Land Use, are anticipated to permanently remove plant and wildlife resources, which could affect both common and special-status species and their habitat.

Significance Criteria

A biological resources impact would be significant if any of the following conditions, as described in Appendix G of the CEQA Guidelines, would result with implementation of the proposed project. 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?
- 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?
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Project Impacts

Impact 6-1: Would the project have a substantial adverse effect on candidate, sensitive or special-status species?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation Measures 6a through 6d	Mitigation Measures 6a through 6d
Significance after mitigation:	Less than significant	Less than significant

Alternative A

Three special-status plant species, Stebbins' morning-glory (*Calystegia stebbinsii*), Follett's monardella (*Monardella follettii*), and Sierra blue grass (*Poa sierrae*), have the potential to occur within the project site. The nearest CNDDB documented occurrence for Stebbins' morning-glory is located approximately 3.9 miles southwest of the project site (Appendix E). No evidence for presence of any special-status plant species was found based on surveys conducted at a time when special-status plant species would have been evident and identifiable and vegetation observed on or near the project footprint. However, ~~on-site surveys were conducted at a time when special-status plant species were not evident or identifiable. S~~since suitable habitat for special-status plant species exists on the project site and plant populations change over time, there is potential that these species may become established within the project site before project construction occurs ~~present~~. Removal of special-status plant species for soil remediation and grading of the project site would result in a significant impact. Mitigation Measure 6a requires that a special-status plant species survey be completed before construction begins and stipulates protection and relocation measures to ensure the continued survival of ~~any~~ special-status plant species ~~on site~~within the project region. Implementation of Mitigation Measure 6a would ensure that potential impacts to special-status plant species are reduced to a **less-than-significant** level.

Only two special-status animal species, Blainville's horned lizard and northern goshawk (*Accipiter gentilis*), have the potential to utilize the project site for nesting, foraging cover and/or for localized movement within the project vicinity. However, the Biological Technical Report (Appendix E) concluded that it is unlikely Blainville's horned lizard would occur on the project site due to lack of appropriate soils and because none were observed during the July 2016 field survey. The Biological Technical Report also concluded that although northern goshawks are known to nest within ~~the~~ ponderosa pine forests, it is unlikely this species would use the project site for nesting since the site is surrounded by development and highly degraded areas. The surveys conducted on the project site found no evidence of the presence of special-status animal species, however ~~due to weather conditions at the time the survey was conducted, the survey is not considered to be determinative of the absence of these species~~it is possible the species could become established at the project site before construction begins. If these species are present within the project site during construction, construction activities could disrupt or harm individuals. In addition, suitable habitat

for other nesting birds and raptors is present in the trees within the project site. Nesting birds and raptors are protected by the Migratory Bird Treaty Act and California Fish and Game Code. Vegetation removal or ~~other~~ noise and vibration from construction activities could result in direct impacts to nesting birds, should they be present at the time of construction. Direct impacts to nesting birds, if present, would be considered significant if they result in nest abandonment during the breeding season. Any harm to Blainville's horned lizard or harm or nesting disruption that occurs to~~,~~ northern goshawk or any nesting bird would be a significant impact.

Mitigation Measure 6b requires that a pre-construction survey be completed to identify presence of Blainville's horned lizard and that avoidance measures be implemented if the species occurs on site. Mitigation Measure 6c requires a preconstruction nesting bird survey be conducted and establishes avoidance measures to protect any active nests. Mitigation Measure 6d requires that all construction workers complete worker environmental awareness training prior to conducting construction activities on site so that all workers are familiar with the types of biological resources that are known to occur on site or have potential to occur on site, and the best management practices for avoiding impacts to these resources. With implementation of Mitigation Measure 6b through 6d, potential impacts to Blainville's horned lizard and nesting birds would be reduced to a **less-than-significant** level.

Alternative B

Alternative B would involve a similar area of disturbance within the project site as Alternative A; it would involve slightly more grading in the southwestern portion of the project site. It would result in the same potential as Alternative A to affect special-status plants and wildlife, including potential effects to the special-status plant species Stebbins' morning-glory (*Calystegia stebbinsii*), Follett's monardella (*Monardella follettii*), and Sierra blue grass (*Poa sierrae*). Removal of special-status plant species for soil remediation and site grading ~~of the project site~~ would result in a significant impact. Mitigation Measure 6a, which ~~would~~ requires a special-status plant species survey and protection and/or relocation measures, would be implemented to ensure that potential impacts to special-status plant species are reduced to a **less-than-significant** level because it would ensure survival of a local population of these species.

As discussed previously, the site has the potential to support Blainville's horned lizard, northern goshawks, and other nesting birds. Implementation of Mitigation Measures 6b through 6d, which require preconstruction surveys, avoidance measures, and worker environmental awareness training, would ensure that the potential for construction activities to harm special-status wildlife species would be reduced to a **less-than-significant** level.

Impact 6-2: Would the project have a substantial adverse effect on riparian habitat or other sensitive natural communities?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Significant	Significant
Mitigation measures:	Mitigation Measure 6e	Mitigation Measure 6e
Significance after mitigation:	Less than significant	Less than significant

As described in Section 6.1, Environmental Setting, there are two sensitive habitats within the project site. This includes 3.15 acres of McNab cypress woodland, located in two patches – one in the northeastern corner of the site and one in the southeastern corner, and a small stand (0.62 acre) of cottonwood forest in the southwestern corner of the site (Appendix E).

Alternative A and Alternative B

Under both Alternative A and Alternative B, the project proposes to remove all of the McNab cypress woodland within the project site. The project entrance from Dorsey Drive is proposed to be placed in the northeastern corner of the site, generally consistent with the existing easement that delineates the anticipated alignment of Spring Hill Drive through the project site. One retail pad, Pad 3, is proposed to be located on the west side of Spring Hill Drive, within the site's northeastern patch of McNab cypress woodland. Under Alternative A, Pad 3 is proposed to include 3,300 square feet while under Alternative B it would include 3,200 square feet. The proposed grading plan involves lowering the northernmost portions of the project site, to create a relatively flat area between Pad 3, Pad 1, and Major 1 under both alternatives. The elevation of Dorsey Drive is approximately 2,705 feet above MSL, and the proposed elevation for Pad 3 is approximately 2,673 feet above MSL. Thus, the grading plan anticipates lowering the site of Pad 3 approximately 26 feet below the existing elevation. The extent of grading required to create this relatively flat area and construct Spring Hill Drive, Pad 3, and the associated parking lot, would remove all of the McNab cypress woodland in this portion of the site.

Similarly, both alternatives propose placing multi-family apartments in the southeastern corner of the project site. The extent of grading required to create building pads and construct the associated parking lot, retaining walls and a stormwater detention basin would remove all of the McNab cypress woodland in this portion of the site.

The project proposes to create a stormwater detention basin in the southwestern portion of the project site under both alternatives. The project would also involve grading, construction of retaining walls, and construction of parking lots in this area. These elements of the project would require the removal of the majority of the cottonwood forest community from the project site.

Removal of all 3.15 acres of McNab cypress woodland and the majority of the 0.62 acres of cottonwood forest from the project site would be a **significant** impact of the project because these vegetation communities are considered sensitive natural communities due to their State rarity ranking of S3.2, as discussed in Section 6.1, Environmental Setting.

Mitigation Measure 6e requires that the project applicant provide compensation for the loss of McNab cypress woodland and cottonwood forest from the project site through a combination of on-site replanting and/or off-site restoration sufficient to ensure no net loss of habitat functions or values in the project region. This would reduce the impact to a **less-than-significant** level.

Impact 6-3: Would the project have a substantial adverse effect on state or federal~~ly protected~~ wetlands?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Significant	Significant
Mitigation measures:	Mitigation Measure 6f	Mitigation Measure 6f
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

As described in Section 6.1, Environmental Setting, the southwestern portion of the project site supports an intermittent drainage and a seasonal wetland (Appendix E). These features are presumed to be federally protected wetlands (under the Clean Water Act) because they flow into an existing City storm drain located under Spring Hill Drive, which outflows to Wolf Creek. In addition, both features are considered waters of the state. The intermittent drainage and seasonal wetland are under the jurisdiction of the RWQCB under Section 401 of the Clean Water Act and the Porter-Cologne Act. The intermittent drainage is also under the jurisdiction of the CDFW under Section 1602 of the California Fish and Game Code.

There is also a cement-lined drainage along the western boundary of the site that appears to have been constructed as part of the drainage system for SR 20/49 and the Dorsey Drive off-ramp. The drainage conveys rainwater runoff north to south and into an ephemeral drainage that flows south to the seasonal wetland. Water from the surrounding hillsides appears to also collect at the seasonal wetland, then flow through the intermitted drainage before entering a culvert and going underground at the southern property boundary.

As discussed in Impact 6-1, under both Alternative A and Alternative B, the project proposes to alter the natural grade, create a stormwater detention basin, and construct retaining walls and parking lots in this portion of the project site. These elements of the project would require the removal of the majority of the seasonal wetland and intermittent drainage from the project site. This loss of wetlands regulated under both federal~~ly protected~~ and state law ~~wetlands~~ constitutes a **significant** impact of the project. Mitigation Measure 6f requires that the project applicant complete and obtain verification

of a jurisdictional delineation to establish the limit of federally protected and state protected wetlands within the project site, obtain ~~a~~ permits to impact wetlands from the ACOE, RWQCB, and CDFW, implement a SWPPP, obtain a Waste Discharge Requirement permit from the RWQCB, and provide compensation for the lost wetlands through a mitigation bank approved by the ACOE and the City of Grass Valley. Implementation of Mitigation Measure 6f would ensure that there is no net loss of habitat values and functions in the region, and would reduce this impact to **less than significant.**

Impact 6-4: Would the project interfere substantially with wildlife movement?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

Alternative A and Alternative B would involve a similar area of disturbance and both alternatives would result in the loss of most of the existing natural habitat within the project site. The project site is not a regional migratory wildlife corridor. The CDFW Essential Connectivity Map shows a statewide network of 850 relatively intact natural landscapes connected by 192 essential connectivity areas. According to this map, the nearest essential connectivity area is located approximately 4.51 miles north of the project site (Appendix E). The project site is bounded on all sides by development and is not contiguous with any wildlife habitat or corridors. The site may provide island habitat for birds and other wildlife adapted to urban environments. As island habitat, the site can facilitate localized movement patterns associated with foraging. Birds and other wildlife adapted to urban environments would be unlikely to use the site during construction. The site does not provide any unique habitat qualities thus the temporary loss of use of the site would not impair wildlife movement and foraging in the project vicinity. Upon completion of construction, localized wildlife movement could occur within the limited natural habitat areas that would remain around the perimeter of the site. Because the site does not support substantial wildlife movement or migration, and the qualities of the site that support localized wildlife movement would remain after site development, either Alternative A or Alternative B would have a **less than significant** effect on wildlife movement.

Impact 6-5: Would the project conflict with local policies or ordinances protecting biological resources?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

Construction of the project under either Alternative A or Alternative B would require removal of most of the existing trees within the project site. As described in Section 6.2, Regulatory Framework, the Grass Valley Tree Preservation Ordinance requires mitigation for removal of any trees that are have a trunk that measures ten inches or larger in diameter DBH. In compliance with the Tree Preservation Ordinance, the project would be required to obtain a construction related tree removal permit. To obtain this tree removal permit, the project applicant must: (a) file an application and filing fee with the tree permit administrator, (b) submit a site plan indicating the location of the trees proposed for removal, (c) tag all trees proposed for removal with pink tagging tape, and (d) submit a tree protection plan for any trees proposed to be retained on site.

As required by the City's Tree Preservation Ordinance, the project would be required to plant either a one and one-half inch caliper healthy and well-branched deciduous tree or a five to six-foot tall evergreen tree for each tree removed. The proposed landscaping plan demonstrates that all tree planting required under the Tree Preservation Ordinance would be accommodated within the project site. Although the Tree Preservation Ordinance allows for planting replacement trees off-site in locations approved by the City and/or paying the City's in-lieu fee for tree mitigation, it is not expected that either of these options would be necessary. Because the Tree Preservation Ordinance stipulates that the requirements for obtaining a tree removal permit must be made conditions of project approval and issuance of the construction related tree removal permit, the City would ensure that the project complies with the Tree Preservation Ordinance prior to issuance of grading permits for the site. Thus the project would have a **less than significant** impact associated with potential conflicts with the City's policies and regulations for the protection of biological resources.

Impact 6-6: Would the project conflict with provisions of an approved regional, state, or local habitat conservation plan?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	No impact	No impact
Mitigation measures:	None required	None required
Significance after mitigation:	No impact	No impact

Alternative A and Alternative B

There are no adopted Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs) within the City of Grass Valley or Nevada County. Therefore, under Alternative A or Alternative B, the project would have **no impact** related to conflict with an adopted HCP or NCCP.

Impact 6-7: Would the project contribute to significant cumulative impacts to biological resources?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

The geographic scope for consideration of cumulative impacts to biological resources is the City of Grass Valley. The main habitat types found in the City include northern mixed chaparral, non-native grassland, black oak woodland, blue oak woodland, canyon live oak forest, foothill pine-oak woodland, west side ponderosa pine forest, and riparian habitats (City of Grass Valley 1999a). Present and probable future projects within the region as discussed in Chapter 3, Land Use, and buildout of the General Plan are anticipated to permanently remove plant and wildlife resources, which could affect both common and special-status species and their habitat, including loss of wetlands and riparian vegetation, McNab cypress, and cottonwood forest. A CNDDB search indicated that 3 special-status animals and 12 special-status plants have the potential to occur within the Grass Valley USGS 7.5-minute quadrangle (Appendix E). As discussed previously, the Dorsey Marketplace project site has potential to support two special-status animal species and three special-status plant species, although based on field surveys none of these species are likely to occur at the site.

The City of Grass Valley General Plan EIR and the Redevelopment Plan Fourth Amendment EIR, both of which are hereby incorporated by reference, found that ~~while~~ buildout of the General Plan would have the potential to result in significant impacts to biological resources, including through the loss of special-status species, sensitive natural vegetation communities, and wetlands. The Redevelopment Plan Fourth Amendment EIR states that vegetation communities that are

predominant in the City include westside ponderosa pine forest, northern mixed chaparral, non-native grassland, black oak woodland, blue oak woodland, canyon live oak forest, foothill pine-oak woodlands, and riparian habitat. It also identifies that the region includes large areas of serpentine and gabbro soil plant communities, which support unique plant and wildlife species. The General Plan EIR and the Redevelopment Plan Fourth Amendment EIR are available for review at the City of Grass Valley City Hall.~~,~~

The General Plan EIR found, and the Redevelopment Plan Fourth Amendment EIR confirmed, ~~these~~ impacts to biological resources would be reduced to a less than significant level through compliance with the policies and standards identified in the General Plan. For example, the General Plan EIR found that with a requirement that development cause "no net loss of habitat functions or values" through "avoidance of the resource, or through creation or restoration of habitat of superior or comparably quality, in accordance with guidelines of the U.S. Fish and Wildlife Service and the California Department of Fish and Game," cumulative impacts to habitat would be reduced to a less than significant level. Specifically, the General Plan EIR found that potential cumulative impacts related to loss of habitat, particularly for sensitive species, loss of wetlands, and adverse effects on movement and dispersal of wildlife and wildlife migration corridors would all be reduced to less than significant levels through compliance with the General Plan and City ordinances. Thus, there would be no significant cumulative impact to which the project could contribute. Further, implementation of Mitigation Measures 6a through 6f would ensure that the project would result in no net loss of habitat functions or values, as discussed in Impacts 6-1 through 6-3.

6.4 MITIGATION MEASURES

Mitigation Measure 6a Prior to issuance of grading permits, focused surveys for special-status plant species shall be conducted by a qualified project biologist according to the following protocol and guidance: CNPS Botanical Survey Guidelines (CNPS 2001); Protocols for Surveying and Evaluating Impacts to Special Status Native Populations and Sensitive Natural Communities (CDFW 2018); and U.S. Fish and Wildlife Service General Rare Plant Survey Guidelines (Cypher 2002). The pre-construction survey shall be conducted during a period when the target species would be observable and identifiable (e.g., blooming period).

If special-status plants are detected during pre-construction surveys, the location of the species will be mapped. If impacts to special-status plants cannot be avoided, the following measures will be implemented:

1. Special-status plants in the vicinity of the disturbance will be temporarily fenced or prominently flagged and a 50-foot buffer established around the populations to prevent inadvertent encroachment by vehicles and equipment during the activity;

2. Seeds/bulbs will be collected and stored in appropriate storage conditions (e.g., cool and dry), and dispersed/transplanted to an area that would not be impacted following the construction activity and reapplication of salvaged topsoil; and

3. The top 6 inches of topsoil will be salvaged, stockpiled, and replaced as soon as practicable after project completion. The salvaged topsoil shall be redistributed at the same depth and contoured to blend with surrounding grades.

Additionally, while it is not expected that a federally or state-listed plant would be observed during these surveys, the applicant shall consult with the applicable agency (i.e., CDFW and/or USFWS) and written concurrence for measures required for federally or state-listed plant species, if observed. If federal or state-listed plant species are observed, the applicant will submit a 2081(b) incidental take permit application to CDFW and a Biological Assessment for the "take" of certain plants that would be affected by the project. As part of the consultation process, a plan to transplant federal or state-listed species will be developed. A transplantation plan for any observed state or federally listed plants will be prepared that includes the following:

1. The area of occupied habitat to be preserved and removed.
2. Identification of on-site or off-site preservation, restoration, or enhancement locations.
3. Methods for preservation, restoration, enhancement, and/or translocation.
4. A replacement ratio and success standard of 1:1 for impacted individuals.
5. A monitoring program to ensure mitigation success.
6. Adaptive management and remedial measures in the event that performance stands are not achieved

~~1.~~7. Financial assurances and a mechanism for conservation of any mitigation lands required in perpetuity.~~a special-status plant species survey shall be conducted at a time when special-status plants are evident and identifiable to determine if they are present on site. Typically this occurs between April and July each year, but may vary somewhat based on weather patterns. The specific timing of the surveys shall be determined by a qualified biologist. Surveys shall be conducted by a qualified biologist knowledgeable of the plant species in the region and shall be floristic in nature. If any special-status plant species are identified during the surveys, a no-disturbance buffer shall be created by the qualified biologist around the species. The perimeter of the buffer zone shall be fenced or marked with staked flags. If avoidance is not possible, consultation shall be initiated with CDFW or USFWS, depending on the status of the species, to establish a plan to ensure the continued presence of these species in the project region. This may include removing plants from the site and transplanting them to a location that is subject to a conservation easement or other mechanism to ensure it remains in open space, seed salvage, other plant propagation measures, and/or offsite habitat creation or restoration. If no evidence exists that special-status plant species are present on the project site, then no further mitigation is required.~~

Mitigation Measure 6b Prior to issuance of grading permits, the project applicant shall develop, in consultation with the CDFW, a Survey, Avoidance and Relocation Plan for Blainsville's horned lizard. The Survey and Avoidance provisions shall include, but not be limited to, the timing and location of the surveys that shall be conducted; the locations where more intensive efforts shall be conducted; the reporting mechanism that shall be used to document survey results; and measures to reduce the potential for this species moving onto the site during construction.

The Relocation provisions shall include, but not be limited to, the proposed relocation site(s); the habitat and conditions in the proposed relocation site(s); the methods that shall be utilized for trapping and relocating the individual species; and mechanisms for documentation/recordation of the species and number of the animals relocated.

The Survey, Avoidance and Relocation Plan shall be submitted to CDFW for approval 60 days prior to any vegetation removal or ground disturbing activities within potentially occupied habitat, which is limited to the California chaparral habitat as shown in Figure 6-1. The Plan shall include the specific survey efforts that shall occur for construction activities that occur both during the activity period of this species (generally March to November) and for periods when the species may be present in the work area but difficult to detect due to weather conditions (generally December through February). Prior to commencement of vegetation removal and grading activities, an exclusion fence shall be installed around the portions of the California chaparral habitat where vegetation removal and grading will occur. During vegetation removal activities, a pre-construction clearance survey shall be performed in potentially suitable habitat for this species at the beginning of each day by a qualified biologist to prevent the take of any Blainville's horned lizards. If any Blainville's horned lizards are observed during surveys, they shall be relocated outside of the project boundary to the designated relocation site and project activities shall resume upon clearance by the designated biologist.~~a pre-construction survey shall be conducted to determine if Blainville's horned lizard is present on site. Surveys shall be conducted by a qualified biologist knowledgeable of the lizard species in the region and shall occur either mid-day in spring or early morning in summer, on a day with full sun or partly cloudy conditions and no precipitation. If any Blainville's horned lizard are identified during the surveys, a no-disturbance buffer shall be created by the qualified biologist around the species. The perimeter of the buffer zone shall be fenced or marked with staked flags. If avoidance is not possible, consultation shall be initiated with CDFW to determine if relocation is appropriate to conserve the species. If no evidence exists that Blainville's horned lizard are present on the project site, then no further mitigation is required.~~

Mitigation Measure 6c Should construction begin during the bird breeding season (February 1 through September 30), a pre-construction nesting bird survey shall be performed by a qualified biologist no sooner than 14 days prior to any groundbreaking activities or tree removal to determine if there are any active nests within the project area (including a 200-foot buffer for raptors). If the construction site remains inactive for more than 1 month during the breeding season and construction would resume during the

breeding season, another pre-construction nesting bird survey shall be performed no sooner than 14 days prior to reactivation of construction activities on site.

If any active nests are observed during surveys, an avoidance buffer shall be determined and flagged by the qualified biologist based on species, location, and planned construction activity (e.g. 50 feet for passerines to 250-500 feet for raptors). These nests shall be avoided until the chicks have fledged and the nests are no longer active, as determined by the qualified biologist. Avoidance could consist of delaying construction in proximity to the nest during the nesting season, or creating a buffer zone between the nest and the activity. If active nests are present, p~~P~~roject activities shall be confined to daylight hours to prevent impacts to foraging nocturnal avian species. If preconstruction surveys indicate nests are inactive or potential habitat is unoccupied during construction period, no further mitigation is required.

Mitigation Measure 6d All construction workers shall receive worker environmental awareness program training conducted by a qualified biologist or an environmentally trained construction manager. Worker environmental awareness program training may also be conducted through a video created by a qualified biologist specifically for this project. Worker environmental awareness program training shall instruct workers to recognize all special-status species potentially present in the project area; identify their habitat; and discuss the nature and purpose of protective measures, including best management practices and other required mitigation measures. Personnel shall be instructed to avoid wetlands and waters on the project site, other than where impacts have been authorized, and to prevent spills, and shall be given contact information for the qualified biologist.

Mitigation Measure 6e Prior to issuance of grading permits, the project applicant shall submit to the City evidence that compensatory habitat conservation and/or restoration for the loss of McNab cypress woodland and cottonwood forest is incorporated within the proposed landscaping plans and/or has been provided for through purchase of credits in a habitat mitigation bank and/or establishment of a conservation easement or other mechanism providing for the site's perpetual conservation on an offsite parcel that supports McNab Cypress woodland and/or cottonwood forest that is of similar habitat quality to that existing on the project site~~offsite habitat~~

~~creation/restoration has been completed on a site subject to a conservation easement or other mechanism providing for the site's perpetual conservation~~. The habitat conservation and/or restoration shall occur over a total area of 3.15 acres for McNab cypress woodland and 0.62 acres for cottonwood forest. This may include a combination of on-site replanting and restoration and off-site restoration sufficient to ensure no net loss of habitat functions or values. On-site planting may include restoration of the disturbed areas of McNab cypress woodland and cottonwood forest, as well as planting of individual McNab cypress and Fremont cottonwood trees as part of the proposed landscaping plan.

Mitigation Measure 6f To the extent practicable, the project shall be designed to avoid impacts to the jurisdictional waters of the U.S. or state within the project site, and the following avoidance/minimization measures shall be implemented:

- Any material/spoils from project activities shall be located away from jurisdictional areas and protected from stormwater runoff using temporary perimeter sediment barriers such as berms, silt fences, fiber rolls, covers, sand/gravel bags, and straw bale barriers, as appropriate.

- Materials shall be stored on impervious surfaces or plastic ground covers to prevent any spills or leakage from contaminating the ground and generally at least 50 feet from the top of bank.

- Any spillage of material shall be stopped if it can be done safely. The contaminated area shall be cleaned and any contaminated materials properly disposed of. For all spills the project foreman or designated environmental representative shall be notified.

Where impacts to jurisdictional waters cannot be avoided, minimization measures shall be applied and all necessary resource agency permits shall be obtained. This may include a Nationwide Permit from the ACOE, Water Quality Certification or Individual or General Waste Discharge Requirements from the RWQCB, and a Streambed Alteration Agreement from CDFW. Proof of compliance shall be submitted to the Grass Valley Planning Department prior to issuance of building and

grading permits and/or demonstration that avoidance of jurisdictional waters will occur during construction.

All temporary impacts to federal- and state-jurisdictional waters shall be restored on site. Restoration will include recontouring and erosion control with a native seed mix. Prior to seeding temporary ground disturbance areas, the project biologist will review the seeding palette to ensure that no seeding of invasive plant species, as identified in the most recent version of the California Invasive Plant Inventory for the region, will occur.

Compensatory mitigation for permanent impacts shall occur off site, and shall occur at a ratio no less than 1:1 for the impact to jurisdictional waters or at a higher ratio if so determined in the jurisdictional waters permits. A waters mitigation and monitoring plan shall be prepared that outlines the compensatory mitigation in coordination with the ACOE, RWQCB, and CDFW.

Mitigation lands shall be comprised of drainages similar to those impacted. Off-site mitigation lands shall be preserved through a conservation easement and the waters mitigation and monitoring plan shall identify an approach for funding assurance for the long-term management of the conserved land. Suitable mitigation lands provided for species, if any are identified, may also be used for mitigation of jurisdictional waters of the state. The proposed 1:1 acreage ratio (or higher ratio if so determined in the jurisdictional waters permits) is considered sufficient to reduce project effects to less than significant because the type of potentially affected jurisdictional features (i.e., ephemeral drainages) are relatively common in the context of regional drainage. It is noted that the final mitigation ratio required by the ACOE, RWQCB and CDFW for acquisition of regulatory permits may differ, but shall be no less than 1:1.~~Prior to issuance of a grading permit, the project applicant shall acquire a Clean Water Act Section 404 permit and Section 401 Water Quality Certification. To compensate for the loss of jurisdictional wetlands associated with proposed activities, the project applicant shall (1) restore and/or create wetlands on site; (2) create wetlands at an off-site location acceptable to the resource agencies; (3) purchase compensatory mitigation credits at an agency-approved mitigation bank; or (4) a combination of 1, 2, or 3. The project applicant shall develop the mitigation approach in conjunction with the~~

~~resource agencies during the permitting process. The mitigation requirements shall be in compliance with federal and state Clean Water Act laws. The final mitigation ratios, design, and implementation shall comply with the terms and conditions of the Section 404 permit issued by the Sacramento District U.S. Army Corps of Engineers and the Section 401 Water Quality Certification and Waste Discharge Requirements issued by the Central Valley Regional Water Quality Control Board~~.

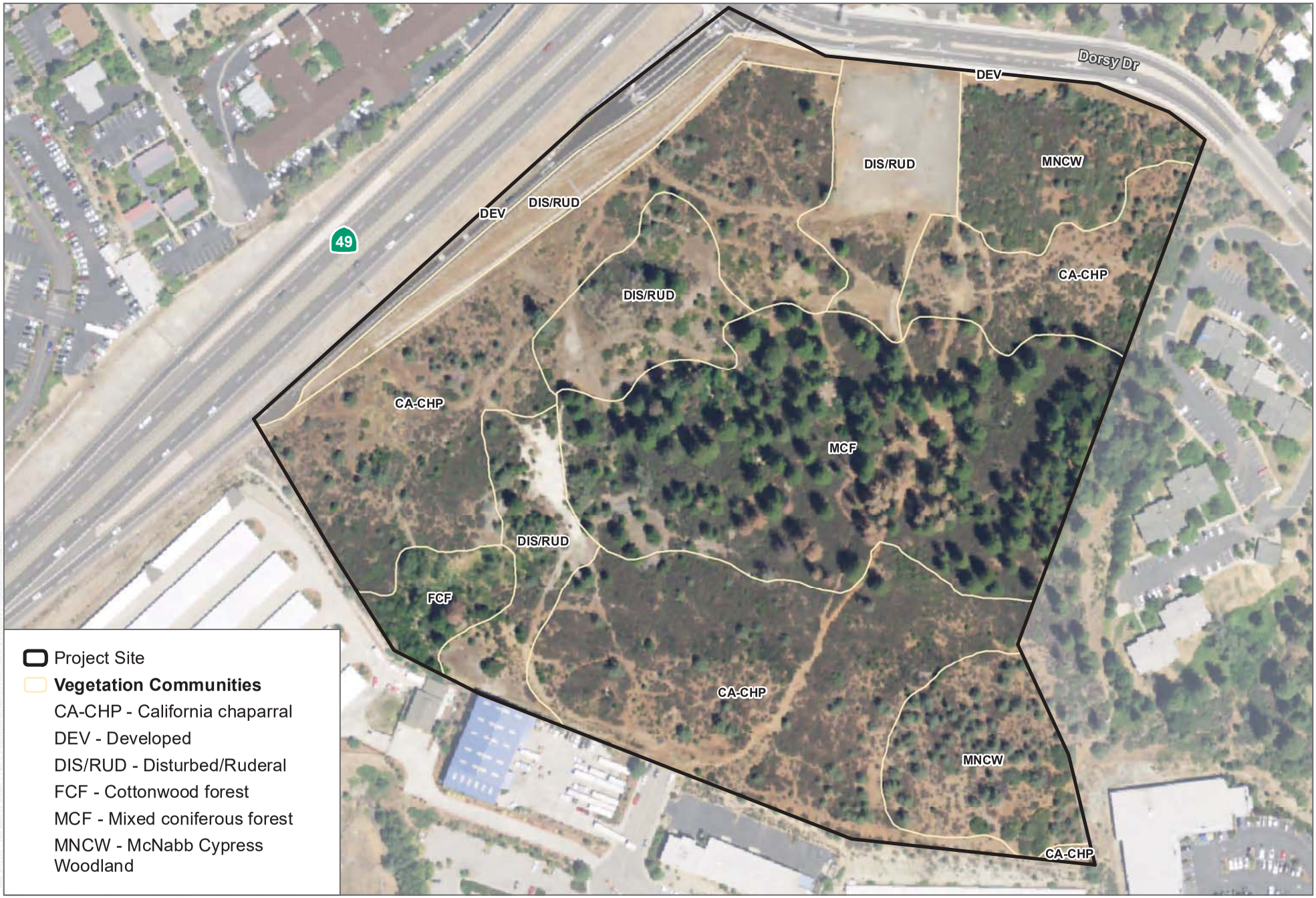
6.5 REFERENCES CITED

City of Grass Valley. 1999a. *City of Grass Valley 2020 General Plan*. Adopted November 23, 1999.

City of Grass Valley. 1999b. *Grass Valley General Plan Update Environmental Impact Report.* Prepared for the City of Grass Valley by Quad Knopf. August 1999.

City of Grass Valley. 2011. "City of Grass Valley Municipal Code – Title 12 – Streets, Sidewalks and Public Places Chapter 12.36 Tree Preservation and Protection." Adopted April 12, 2011. Accessed Available at http://www.cityofgrassvalley.com/government/municipal-codes

Quad Knopf. 1998. *Grass Valley General Plan Background Report*. Prepared November 1998.



SOURCE: USDA 2016

DUDEK

0 100 200 Feet

FIGURE 6-1

Vegetation Comminities

Dorsey Marketplace EIR

SOURCE: USDA 2016

DUDEK

0 100 200 Feet

FIGURE 6-2

Aquatic Features

Dorsey Marketplace EIR

CHAPTER 7
CULTURAL RESOURCES

This section describes the potential for prehistoric resources, historical resources, and tribal cultural resources to be damaged as a result of development of the project, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures related to implementation of the proposed Dorsey Marketplace Project (proposed project). Prehistoric resources include sites and artifacts associated with the indigenous, non-Euro-American population, generally prior to contact with people of the European descent. Historical resources consist of structures, features, artifacts, and sites that date from Euro-American settlement of the region. Information referenced to prepare this section includes the following:

- *City of Grass Valley 2020 General Plan* (City of Grass Valley 1999)
- *Grass Valley General Plan Update Background Report* (Quad Knopf 1998)
- *Cultural Resources Inventory Report for the Dorsey Marketplace Project Grass Valley, Nevada County*, prepared by Dudek (Appendix F)

One comment letter addressing cultural resources was received in response to the Notice of Preparation (NOP) for this EIR. The letter was sent by the Native American Heritage Commission (NAHC) and requested compliance with the tribal consultation requirements of Assembly Bill 52 and Senate Bill 18. A copy of the NOP and comments received in response to the NOP is included in Appendix A.

7.1 ENVIRONMENTAL SETTING

Paleoindian Period (Pre-5500 BC)

Occupation of the Sierra Nevada region is likely to have occurred at least 9,000 years ago, however, only a handful of Paleoindian Period lithic bifacial points have been recorded. Of these recorded points, the nearest were found in the Sierra Valley west of Reno, Nevada, Ebbett's Pass south of Lake Tahoe, and at the Sailor Flat site in the Tahoe National Forest (Appendix F). Typical assemblages of the Paleoindian period include large stemmed projectile points, high proportions of formal lithic tools, bifacial lithic reduction strategies, and relatively small proportions of ground stone tools (Appendix F).

Late Prehistoric Period (AD 500 to AD 1750)

The Tahoe Reach is currently the most commonly applied cultural temporal sequence in this region (Appendix F). This sequence contains the Washoe Lake Phase, Tahoe Reach Phase, Spooner Phase, Martis Complex, and Kings Beach Complex; of which the Martis Complex and the Kings Beach Complex are most applicable to the project area (Appendix F).

Martis Complex (3000 BC to AD 500)

The Martis complex has been identified to extend from Lassen County to Alpine County from 3000 BC to approximately 500 AD Subsidence during the Martis Complex was based on hunting and seed collecting economy, with highly mobile populations that exploited both upper and lower regions based on seasonal abundance of resources (Appendix F). Temporally representative tools include finger-held drills or punches, retouched volcanic flake scrapers, spokeshave-notched tools, and large biface blades and cores (Appendix F).

Kings Beach Complex (AD 500 – Historic Contact)

The Kings Beach Complex was characterized by migrating populations that traveled between upper areas during the warmer months and lower elevations during the fall and winter months with subsidence being primarily based on fishing and gathering (Appendix F). A reduction in size and weight of projectile points corresponded with adoption of bow and arrow technology and typical point forms within the region included desert side-notched, cottonwood, and rosegate series (Appendix F). Obsidian and chert, which are not local to the region, replaced volcanic materials such as basalt as the preferred materials for the manufacturing of lithic tools. The greater presence of these exotic materials and greater use of marine shell resources attests to increased trade capabilities with neighboring tribes. The Kings Beach Complex also included a reliance on acorns as exemplified by the increased presence of bedrock mortars and pestles formed from local cobbles. While the creation of mortars indicated a relatively high investment of time and energy, such bedrock milling features are just as frequently found at sites with limited-to-no subsurface cultural deposits as at intensive use occupations area with well-developed midden soils (Appendix F).

Ethnohistoric Period (Post-AD 1750)

During the ethnohistoric period, the region surrounding the project area would have been in Hill Nisenan (also known as the Southern Maidu) tribal territory (Appendix F). The Hill Nisenan tribal group utilized the resources of the Yuba, Bear, and American River watersheds extending from the Sierra Nevada summit to the Sacramento River. Habitations were commonly situated near primary drainages, along ridgelines with mild slopes and south-facing exposures and traditional village features included bedrock milling stations, granaries, conical housing structures, and sweat and ceremonial houses (Appendix F). Five major villages existed within an approximately 6-mile radius of Grass Valley, including Tuyi to the southeast, Tetema northeast of Nevada City, Kayempaskan northwest of Grass Valley, Hi'et on Wolf Creek and Tsekankanto the west of Grass Valley (Quad Knopf 1998). Typically, the dead were cremated and buried within the boundaries of the habitation area.

The Nisenan were highly mobile and their diet was centered on fishing, hunting, and collecting vegetative resources. Common tools of this time period included bows and arrows, traps,

harpoons, hooks, nets, portable and stationary grinding implements, and pestles and handstones. Some goods, such as canoes, were constructed from fibrous plants like tule balsa or logs. Imported items included shell ornaments and beads, green pigment, tobacco, steatite items and obsidian, while exported goods included bows and arrows, animal skins, pine nuts and other local resources (Appendix F).

The Nisenan spoke one of four closely related Maiduan languages, which include Konkow, Chico Maidu, Mountain Maidu, and Nisenan. The structure of these Maiduan languages suggests that all four languages were descended from the same proto-Maiduan speaking population to the north (Appendix F). Likely, these populations spread southward in the last 1,200 years as the Nisenan encroached into area previously occupied by the Miwok tribal groups sometime in the past few centuries. This population movement is substantiated by the high frequency of Miwok loan words in the Nisenan language, which is not a trait found in the other three Maiduan languages (Appendix F).

Historic Period

Spanish Period (1769-1822)

Exploration of the San Francisco Bay began in 1769 by Gaspar de Portola. Additional explorations of the bay and the plains to the east were conducted in 1772 by Father Pedro Eages and in 1776 by Juan Bautista De Anza. The first expedition to the Sacramento Valley was completed in 1808 by Lieutenant Gabriel Moragain, and explored areas along the American, Calaveras, Cosumnes, Feather, Merced, Mokelumne, Sacramento, and Stanislaus River Watersheds. The most recent Spanish expedition into this region was conducted in 1817 by Luis Arguello, which traveled up the Sacramento River to the mouth of the Feather River.

The Spanish missionization of Alta California was initiated in San Diego in 1796 and lasted until 1823. During this period, a total of 21missions were constructed including five in the region: San Francisco de Asis (1776), Santa Clara de Asis (1776), San Jose de Guadalupe (1797 in Alameda County), San Rafael Arcangle (1817 in Marin County), and San Francisco Solano (1823 in Sonoma County). While missionization had a detrimental effect on tribes throughout the region, there is no record of forcible transport of Nisenan communities by the Spanish to the missions (Appendix F).

Mexican Period (1822-1848)

Native populations were further disrupted by Mexico's separation from the Spanish empire in 1821 and the secularization of the California missions in the late 1830s. Native American lands were seized by the Mexican republic and provided as part of larger Land Grants to affluent Mexican citizens and rancheros. The two largest areas of land in Sacramento Valley area was granted to Captain John Sutter. In 1839 Sutter founded New Helvetica, a trading and agricultural empire that

was headquartered within the Valley Nisenan territory at the confluence of the Sacramento and American rivers (Appendix F).

American fur trappers and traders conducted a number of exploratory intrusions into west Sierra Nevada Mexican territory. In 1826, Jedidiah Smith led a small party of trappers in an expedition along the Sierra Nevada and eventually entered the Sacramento Valley in 1827 (Appendix F). This expedition created maps of the territory that provided for the waves of European prospectors, ranchers, and settlers that would come in the following decades.

American Period (Post 1848)

California's physical and cultural landscapes were extensively changed and shaped by the mining of precious metals and other minerals following the discovery of gold in January of 1848 at Sutter's Mill in Coloma, on the South Fork of the American River. The following historic context is restricted to the origins and effects of mining in the American River Basin focusing on the Auburn area where the project is located. A comprehensive discussion of the history and context of mining activities at the statewide level can be found in *A Historical Context and Archaeological Research Design for Mining Properties in California* (Appendix F).

Within months following the initial discovery of gold, gold was being collected in the gravel bars of the North, Middle and South Forks of the American River. The effects of mining activities are still evident in the form of tailings ditches, and other mining features scattered throughout these areas. Gold was first discovered in the Auburn area on May 16, 1848, by Claude Chana and for the remainder of the month of May, Chana and his group continued to pan for gold just south of what is today the City of Auburn (Appendix F). By the summer of 1849, the area was transformed into a small community of wood and fabric buildings, originally known as North Fork Dry Diggings but was renamed Auburn sometime between Summer and Fall 1849.

Dr. Saunders built a cabin on Badger Hill at the eastern edge of present day Grass Valley in August of 1849. Others soon moved to the area including Reverend H.H. Cummings who built four cabins on the south side of the Boston Ravine. A sawmill was established in Fall 1849 and the post office was established on July 10, 1851, under the name of Centerville, which was changed to Grass Valley on August 20, 1852 (Quad Knopf 1998).

Development of the Mining Industry

Gold-bearing quartz was discovered at Gold Hill in 1850 and at Ophir, Rich and Massachusetts Hills shortly after; Gold Hill and Allison Ranch were the leading load mines during the 1850s (Quad Knopf 1998). A total of 98 mines are listed for Grass Valley with much of the mining activity taking place between 1850 and 1900. Mining operations slowed down following the Comstock bust in the mid-1960s but placer mining around Grass Valley was revived in 1870 due to the increase in

hydraulic-mining technology (ACS 2008). Mining operations began to slow down again in the early part of the 1900s; however, small scale placer mining using Gold Rush ear techniques made a brief reappearance during the Great Depression. Depression-era miners typically reworked old diggings in formerly mined areas or moved into previously unmined locations, often on public lands (Appendix F). During World War II mining operations were suspended, which led to the failure of many mines in Nevada County. After the war four mines (Empire, Pennsylvania, North Star and Idaho-Maryland) reopened, but eventually the last two closed in 1956 and 1957 ending 106 years of mining operations in the Grass Valley District (ACS 2008).

Record Search Results

Previous Research

Staff at the North Central Information Center (NCIC) at California State University Sacramento completed a records search for a 1-mile radius around the project area on April 11, 2016. A total of 49 previous studies were identified by the records search, of which three have covered at least a portion of the project area. These three reports are summarized below.

Jensen 2001

This report documents the results of an archaeological inventory completed for the DeSena 6.5-acre Development Project located close to Highway 49 and north Empire Mine Road. A records search conducted at the NCIC indicated that no previous surveys have been completed for the project site and no cultural resources had been identified within or immediately adjacent to the site. Jensen & Associates conducted an intensive pedestrian survey of the project site in 2001. The survey did not identify any prehistoric or historic cultural resources or materials on the project site but did observe that the site had been impacted by previous mining operations at Spring Hill and Idaho-Maryland. The negative results of the records search and field survey concluded that development of the property would not affect archaeological or built environmental resources, and no further mitigation was required (Appendix F).

Werner 1989

This report details the results of an archaeological pedestrian survey conducted for the 5.6-acre Nevada Terraces Development project in 1989 located generally south of the currently proposed Dorsey Marketplace area of potential effect (APE). No cultural resources have been recorded on the project site, no previous studies have been conducted and no archaeological site or materials were identified during the pedestrian survey. The negative results of the records search and field survey concluded that development of the property would not affect archaeological or built environmental resources, and no further mitigation was required (Appendix F).

Medin 2005

This report presents the results of an archaeological pedestrian survey conducted for the Dorsey Drive Interchange Project by the California Department of Transportation (Caltrans) in 2005. The initial archaeological survey was conducted in August 2001 and a follow-up survey was conducted in November 2005. The surveys identified two resources within the project area—the Spring Hill Mine and the Stone Ditch, which was a water conveyance feature; however, Caltrans archaeologists noted that neither of these properties appears to be important under NRHP criteria. The Spring Hill Mine consists of five concrete foundation features that correspond to buildings documented in the county assessor's building records. However, the integrity of the site was compromised because all of the buildings and Spring Hill mining equipment have been removed from the area. The remaining concrete features provide limited data potential beyond the descriptive recordation that has previously been completed. Stone Ditch has been destroyed by development and no remains of the site were present during the recent Dudek survey. No further study was recommended by Caltrans (Appendix F).

Historical Map Review

As part of the Cultural Resources Inventory Report (Appendix F) prepared for the project, historical aerial photographs from the years 1947, 1998, 2005, 2009, 2010, and 2012 were reviewed for the project area. The 1947 photograph shows the Spring Hill Mine and associated structures located in the central portion hill, with evidence of grading/clearing activities located west of the project area. The surrounding area is vegetated with pine, oak and cotton trees. In 1998, the central portion of Spring Hill is surrounded by development on the north, south, east and west sides making Spring Hill Mine and the associated structures no longer visible. A couple of dirt trails bisect the project area, running north-south. The 2005, 2009, 2010, and 2012 photographs did not show any changes to the project site or surrounding area and represent what the project site looks like to date.

Geoarchaeological Information

There is a very low potential for intact prehistorical cultural resources to be present on the project site due to the substantial disturbance of native soils from historical mining (Appendix F). However, there is also a potential that past mining activity resulted in the deposition of historical deposits and/or features. A geotechnical investigation of the project area was conducted by Holdrege & Kull (Appendix J1) between July and August 2007. A surface reconnaissance of the site completed by Holdrege & Kull noted that the western and central portions of the property contained abandoned mine features and the eastern portion was disturbed but undeveloped. Holdrege & Kull identified the Spring Hill shaft in the central portion of the property, which had been capped with concrete, as depicted on the historical Spring Hill Mine map. Several concrete foundations corresponding to the

locations of the mining features were observed and Holdrege & Kull noted that approximately 6.5 acres of the 27-acre project site contained mine waste (waste rock composed of mineralized serpentine and diabase rock with quartz).

Current Research Results

The records search identified one cultural resource, Spring Hill Mine, within the project site and an additional 26 cultural resources within the records search area. The Spring Hill Mine site was recorded by Caltrans archaeologists Medin and Schinke in 2001 as previously described. The mine was claimed in 1871 and operated until approximately the 1970s. It was evident that the mine had undergone improvements in the 1930s, which most likely destroyed any archaeological deposits or features that remained from the 1870s era of operations. The site consists of five mine features corresponding to the buildings documented in the county assessor's building records: a concrete foundation, warehouse and shower, head frame foundation, hoist house, and the former mill location. According to Caltrans, the Spring Hill Mine does not appear eligible for NRHP or CRHR listing in 2001 (Appendix F).

Native American Heritage Commission Search Results

Dudek contacted the Native American Heritage Commission (NAHC) on March 14, 2016, to request a search of the Sacred Lands File. The NAHC's response on March 24, 2016, indicated that the search failed to identify any Native American resources in the vicinity of the project (Appendix F). Letters containing a brief description of the planned project, reference maps and a summary of the NAHC Sacred Lands File and the NCIC search results were sent on April 5, 2016 to the listed tribal representatives. No response to these outreach attempts have been received to date (Appendix F).

Pedestrian Survey Results

An intensive pedestrian cultural survey of the project area was conducted by Dudek Archaeologist Kurt Lambert on April 28, 2016. The survey was conducted in compliance with the Secretary of the Interior's standards and guidelines for a cultural resources inventory. Survey methods consisted of walking parallel transects spaced no more than 10 meters apart over the entire project area and examining the ground surface for prehistoric artifacts, soil discoloration, soil depressions, features indicative of the current or former presence of structures or buildings and historic artifacts. Documentation of the site conditions and Spring Hill Mine complied with the Office of Historic Preservation and Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716-44740) and the California Office of Historic Preservation Planning Bulletin Number 4(a). Additionally, the Spring Hill Mine was recorded on California Department of Parks and Recreation Form DPR 523L (Series 1/95) Continuation Sheet, using the *Instructions for Recording Historical Resources* (Appendix F).

As previously recorded, the abandoned Spring Hill Mine concrete foundations, machinery anchor features, and shaft location were identified in the western portion of the site and the eastern portion of the site was disturbed but no mining or other features were present. The previously recorded historic Spring Hill Mine site (P-29-2455) was relocated during the field survey. The distribution and number of features observed during the survey were consistent with the observations recorded by Caltrans in 2001. Additional graffiti and illicit dumping of modern refuse was recorded at the features but no historical or cultural constituents were observed on the surface of the site (Appendix F).

Assembly Bill 52 Tribal Consultation

The City drafted contact letters to the United Auburn Indian Community (UAIC), which is the only tribe that has requested to be notified of projects within the City of Grass Valley under Assembly Bill (AB) 52. On February 16, 2016, a letter was sent via certified mail to the UAIC. This tribe is traditionally and culturally affiliated with the project area. The letter provided information regarding the project and requested that UAIC share any information or concerns regarding tribal cultural resources that could be affected by the project. The letter informed the UAIC of the initiation of the environmental review process for the project, project location and details, and the opportunity for consultation regarding the project. The letter conveyed that the recipient had 30 days from the receipt of the letter to request or deny, in writing, consultation for the project.

The UAIC responded to the City's notification letter on April 27, 2016, via the U.S. Postal Service to request consultation for the project. and providing recommended mitigation measures. Although this response was received outside of the 30-day consultation period allowed under AB 52, the City responded to the UAIC request for consultation via email. The City and UAIC representatives discussed the project by telephone and email. Subsequent to those discussions, UAIC informed the City that there was no further need for consultation.

7.2 REGULATORY SETTING

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. Several laws and regulations at the federal and state level govern archaeological and historic resources deemed to have scientific, historic, or cultural value. The pertinent regulatory framework, as it applies to the proposed project, is summarized in the following text.

Federal Regulations

National Historic Preservation Act

The National Historic Preservation Act of 1966 established the National Register of Historic Places (NRHP) as the official federal list of cultural resources that have been nominated by state offices for their historical significance at the local, state, or national level. Properties listed in the NRHP, or determined eligible for listing, must meet certain criteria for historical significance and possess integrity of form, location, and setting. Under Section 106 of the act and its implementing regulations, federal agencies are required to consider the effects of their actions, or those they fund or permit, on properties that may be eligible for listing or that are listed in the NRHP. The regulations in 36 CFR 60.4 describe the criteria to evaluate cultural resources for inclusion in the NRHP. Properties may be listed in the NRHP if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and they:

A. Are associated with events that have made a significant contribution to the broad patterns of our history;

B. Are associated with the lives of persons significant in our past;

C. Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded, or may be likely to yield, information important in prehistory or history.

These factors are known as Criteria A, B, C, and D.

In addition, the resource must be at least 50 years old, except in exceptional circumstances. Eligible properties must meet at least one of the criteria and exhibit integrity, which is measured by the degree to which the resource retains its historical properties and conveys its historical character, the degree to which the original fabric has been retained, and the reversibility of the changes to the property. Archaeological sites are evaluated under Criterion D, which concerns the potential to yield information important in prehistory or history.

The Section 106 review process, typically undertaken between the U.S. Army Corps of Engineers as part of issuing a Section 404 permit and the State Historic Preservation Officer, involves a four-step procedure:

- Initiate the Section 106 process by establishing the undertaking, developing a plan for public involvement, and identifying other consulting parties.

- Identify historic properties by determining the scope of efforts, identifying cultural resources, and evaluating their eligibility for inclusion in the NRHP.
- Assess adverse effects by applying the criteria of adverse effect on historic properties (resources that are eligible for inclusion in the NRHP).
- Resolve adverse effects by consulting with the State Historic Preservation Officer and other consulting agencies, including the Advisory Council on Historic Preservation, if necessary, to develop an agreement that addresses the treatment of historic properties.

The Department of the Interior has set forth Standards and Guidelines for Archaeology and Historic Preservation. These standards and guidelines are not regulatory and do not set or interpret agency policy. A project that follows the standards and guidelines generally shall be considered mitigated to a less-than-significant level, according to Section 15064.5(b)(3) of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.).

State Regulations

California Register of Historical Resources

California Public Resources Code, Section 5024.1, authorizes the establishment of the CRHR. Any identified cultural resources must therefore be evaluated against the CRHR criteria. In order to be determined eligible for listing in the CRHR, a property must be significant at the local, state, or national level under one or more of the four significance criteria, modeled on the NRHP. In order to be determined eligible for listing in the CRHR, a property must be significant at the national, state, or local level under one or more of the following four criteria:

1. It is associated with events or patterns of events that have made a significant contribution to the broad patterns of the history and cultural heritage of California and the United States.
2. It is associated with the lives of persons important to the nation or to California's past.
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. It has yielded, or may be likely to yield, information important to the prehistory or history of the state and the nation.

In addition to meeting one or more of the previous criteria, a significant property must also retain integrity. Properties eligible for listing in the CRHR must retain enough of their historic character to convey the reason(s) for their significance. Integrity is judged in relation to location, design, setting, materials, workmanship, feeling, and association.

California Environmental Quality Act

Under CEQA (California Public Resources Code, Section 21000 et seq.), public agencies must consider the effects of their actions on both historical resources and unique archaeological resources. Pursuant to CEQA Section 21084.1, a "project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." Section 21083.2 requires agencies to determine whether proposed projects would have effects on "unique archaeological resources."

"Historical resource" is a term of art with a defined statutory meaning (see California Public Resources Code, Section 21084.1, and 14 CCR 15064.5(a) and 15064.5(b)). The term embraces any resource listed in or determined to be eligible for listing in the CRHR. The CRHR includes resources listed in or formally determined eligible for listing in the NRHP, as well as some California State Landmarks and Points of Historical Interest.

Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be "historical resources" for purposes of CEQA unless a preponderance of evidence indicates otherwise (California Public Resources Code, Section 5024.1, and 14 CCR 4850). Unless a resource listed in a survey has been demolished or has lost substantial integrity, or there is a preponderance of evidence indicating that it is otherwise not eligible for listing, a lead agency should consider the resource potentially eligible for the CRHR.

In addition to assessing whether historical resources potentially impacted by a proposed project are listed or have been identified in a survey process, lead agencies have a responsibility to evaluate them against the CRHR criteria as discussed previously, prior to making a finding as to a proposed project's impacts to historical resources (California Public Resources Code, Section 21084.1, and 14 CCR 15064.5(a)(3)). The fact that a resource is not listed or determined to be eligible for listing does not preclude a lead agency from determining that it may be a historical resource (California Public Resources Code, Section 21084.1, and 14 CCR 15064.5(a)(4)).

CEQA also distinguishes between two classes of archaeological resources: archaeological sites that meet the definition of a historical resource, as described previously, and unique archaeological resources. Under CEQA, an archaeological resource is considered "unique" if it:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; or

- Is directly associated with a scientifically recognized important prehistoric or historic event or person (California Public Resources Code, Section 21083.2(g)).

CEQA states that if a proposed project would result in an impact that might cause a substantial adverse change in the significance of a historical resource, then an EIR must be prepared and mitigation measures and alternatives must be considered. A "substantial adverse change" in the significance of a historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired (14 CCR 15064.5(b)(1)).

The CEQA Guidelines (Section 15064.5(c)) also provide specific guidance on the treatment of archaeological resources, depending on whether they meet the definition of a historical resource or a unique archaeological resource. If the site meets the definition of a unique archaeological resource, it must be treated in accordance with the provisions of California Public Resources Code, Section 21083.2.

CEQA Guidelines, Section 15064.5(e), requires that excavation activities be stopped whenever human remains are uncovered and that the county coroner be called in to assess the remains. If the county coroner determines that the remains are those of Native Americans, the NAHC must be contacted within 24 hours. At that time, the lead agency must consult with the appropriate Native Americans, if any, as identified in a timely manner by the NAHC. Section 15064.5 of the CEQA Guidelines 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.

Senate Bill 18

Senate Bill (SB) 18 (Government Code, Sections 65352.3, 65352.4) requires that, prior to the adoption or amendment of a general plan proposed on or after March 1, 2005, a city or county must consult with Native American tribes with respect to the possible preservation of, or the mitigation of impacts to, specified Native American places, features, and objects located within that jurisdiction.

Senate Bill 297

SB 297 addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction; and establishes the NAHC to resolve disputes regarding the disposition of such remains. The provisions of SB 297 have been incorporated into Section 15064.5(e) of the CEQA Guidelines.

Assembly Bill 52

Assembly Bill (AB) 52 requires consultation with Native American tribes traditionally and culturally affiliated with the geographic area in which a project requiring CEQA review is proposed if those tribes have requested to be informed of such proposed projects. The intention of such consultation is to avoid adverse impacts to tribal cultural resources. This law is in addition to existing legislature protecting archaeological resources associated with California Native American tribes. AB 52 applies to all projects initiating environmental review in or after July 2015.

California Health and Safety Code

Section 7050.5(b) of the California Health and Safety Code specifies protocols to address any human remains that may be discovered. The 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 overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of section 27492 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner and cause of death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in section 5097.98 of the Public Resources Code.

Local Regulations

Grass Valley 2020 General Plan

The Grass Valley General Plan Historical Element has adopted goals, objectives, policies, and implementation measures aimed at the preservation and enhancement of historical and cultural resources within the City. The following goal (HG) and policies (HP) are applicable to the proposed project:

1-HG: Conserve and enhance the historical identity of Grass Valley.

4-HP: Enhance the appearance of the City entryways, commercial areas, and streetscapes, in part through the use of elements in the design standards that complement Grass Valley's historic heritage.

10-HP: Where historic and prehistoric cultural resources have been identified, the City shall require that development be designed to protect such resources from damage, destruction, or defacement.

11-HP: If previously undiscovered cultural resources or human remains are encountered during construction or excavation, the procedures identified in Section 15064.5 of the CEQA Guidelines shall be followed.

7.3 IMPACTS

Methods of Analysis

A records search along with a pedestrian survey of the site was conducted in April 2016 by Dudek. The results of these searches and surveys are included in the *Cultural Resources Inventory Report for the Dorsey Marketplace Project Grass Valley, Nevada County* (Appendix D). The survey also included consultation with the NAHC and a sacred lands file search. No Native American cultural resources were identified within the survey area. This research established the historic context and derived locations of other resources that may exist or have existed within the project area.

Although the project-specific impact analysis for cultural resources necessarily includes separate analyses for prehistoric resources, historic-period resources, and human remains, the cumulative analysis combines these resources into a single, non-renewable resource base and considers the additive effect of project-specific impacts to significant regional impacts on cultural resources.

Significance Criteria

Potential impacts associated with cultural resources have been evaluated using the following criteria, based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.). The proposed project would have a potentially significant impact related to cultural resources if it would:

- Cause a substantial adverse change in the significance of a historical or archaeological resource as defined in CEQA Guidelines, Section 15064.5.
- Disturb any human remains, including those interred outside of formal cemeteries.

An adverse change in the significance of a historical or archaeological resource is one that would disturb, damage, or destroy the resource, while the disturbance of damage would reduce or eliminate the potential for the resource to yield important information and context regarding history.

Impact Analysis

Impact 7-1: Would the project cause a substantial adverse change in the significance of a historical resource, archaeological resource, or tribal cultural resource?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation Measure 7a	Mitigation Measure 7a
Significance after mitigation:	Less than significant	Less than significant

Alternative A

As described in Section 7.1, Environmental Setting, the records search identified one cultural resource, Spring Hill Mine, within the project site. The Spring Hill Mine consists of five concrete foundation features that correspond to buildings documented in the county assessor's building records, but all buildings and mine equipment have been removed from the area. An earlier archaeological survey identified the Stone Ditch feature within the project area. The Stone Ditch was destroyed by development of the Dorsey interchange and no remains of the site were present during the most recent survey. According to Caltrans, neither the Spring Hill Mine or the Stone Ditch appeared eligible for NRHP or CRHR listing in 2001 (Appendix F). Per correspondence with the NAHC, no Native American resources have been identified in the vicinity of the project, and no responses to NAHC outreach attempts regarding the proposed project have been received (Appendix F). Further, consultation with UAIC under AB 52 did not identify any tribal cultural resources within the project site or the vicinity that could be adversely affected by development of the proposed project.

Due to the substantial disturbance of native soils from historical mining, there is a very low potential for intact prehistorical cultural resources to be present on the project site (Appendix F). However, there is also a potential that past mining activity resulted in the deposition of historical deposits and/or features, such as mining historic period mining deposits and other artifacts, and that those could be uncovered during construction. Unanticipated discovery of historical or archaeological resources could result in adverse effects to the integrity and significance of those resources; therefore the chance for such discovery is considered a **potentially significant** impact under Alternative A. Implementation of **Mitigation Measure 7a** would reduce this impact to **less than significant** by requiring construction worker training to identify potential resources and requiring that earth-disturbing activities within 100 feet of a potential resource be halted until a qualified archaeologist completes a significance evaluation.

Alternative B

Alternative B would involve a similar area of disturbance as Alternative A. Therefore, Alternative B would result in the same **potentially significant** impact associated with unanticipated discovery

of prehistorical and historical cultural resources. Implementation of **Mitigation Measure 7a**, as described previously, would reduce this impact to **less than significant**.

Impact 7-2: Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A

As described under Impact 7-1, no burial sites or cemeteries were identified within the project site during the 1989, 2001, 2005, or 2016 archaeological surveys. However, the field surveys relied on ground-level observations and did not include excavation. It is possible that informal burials could have occurred on site during prehistoric and historic periods. If any burials occurred, earth-moving construction activities, such as grading and excavation, could disturb human remains, which would be a significant impact. However, the project site has already experienced substantial disturbance of native soils from historical mining. Therefore, there is a very low potential for intact cultural resources or human remains to be present on the project site. Per the State Health and Safety Code (Section 7050.5), in the unlikely event that human remains are discovered, work will halt in that area and procedures set forth in the will be followed, beginning with notification to the City of Grass Valley and County Coroner. Construction contractors must comply with Section 7050.5(b) as a matter of law. As described in Section 7.2 Regulatory Setting, Section 7050.5(b) of the California Health and Safety Code requires that when any human remains are discovered, no further disturbance of the discovery site or nearby areas until the County coroner has investigated and made recommendations "concerning treatment and disposition of the human remains." Further, if the remains are determined to be of Native American descent, the Coroner will notify the Native American Heritage Commission, which will notify and consult ~~this section requires notification of and consultation with~~ "those persons [the ~~coroner~~Commission] believes to be most likely descended from the deceased Native American. The descendants may, with the permission of the owner of the land, or his or her authorized representative, inspect the site of the discovery of the Native American human remains and may recommend to the owner or the person responsible for the excavation work means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods," as provided by section 5097.98 of the Public Resources Code.

Compliance with the applicable provisions of the California Health and Safety Code and Public Resources Code would ensure that this impact remains **less than significant** because the proper protocols, as set forth by state law, would be followed in the event human remains are discovered.

Alternative B

Similar to Impact 7-1, Alternative B would involve a similar area of disturbance within the project site and therefore carries the same chance as Alternative A of discovering presently unidentified burials or human remains on the project site. If any burials occurred on site, earth-moving construction activities, such as grading and excavation, could disturb human remains, which would be a significant impact. In the unlikely event that remains are discovered on site, Alternative A would be required by state law to comply with State Health and Safety Code (Section 7050.5) and Public Resources Code (Section 5097.98), in which case, construction would halt in the area of the discovery, the County coroner would be notified and would investigate, and if the remains are determined to be of Native American descent, the most likely descendants would be notified and allowed to inspect and make recommendations for the appropriate treatment of the remains. Compliance with state law would ensure that Alternative B would have a **less-than-significant** impact associated with any discovery of human remains.

Impact 7-3: Could project construction contribute to a cumulative loss of cultural resources?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

Alternative A and Alternative B would occur on the same project site and involve similar areas of disturbance. The project site is not known to support any archaeological or historic resources. The two alternatives have the same potential to result in significant impacts to presently unknown archaeological and historic resources that may be encountered during construction; thus they have the same potential to contribute to cumulative impacts to these resources.

Archaeological Resources and Tribal Cultural Resources

For the analysis of cumulative impacts to archaeological resources and tribal cultural resources, the geographic area is the project region, which includes the City of Grass Valley and adjacent areas within Nevada City, the unincorporated community of Alta Sierra, and other unincorporated areas of Nevada County. Development under the cumulative scenario in this area is expected to include buildout of the City of Grass Valley 2020 General Plan and the individual projects described in Chapter 3, Land Use, of this EIR.

Because all significant archaeological resources and human remains are unique and non-renewable members of finite classes, all adverse effects or negative impacts erode a dwindling resource base.

The loss of any one archaeological site affects all others in a region, because the cultural setting context for a given region is a reflection of all the cultural resources in that region and these resources are best understood in the context of the entirety of the cultural system of which they are a part. Tribal cultural resources are resources that are related to or may reflect a tribe's traditional and cultural activities and beliefs. They may occur in a specific individual location or may range across a broad landscape. These resources also contribute to the cultural setting context for a given region. While there are no currently known tribal cultural resources in the project region, some may be identified through the AB 52 consultation process as development occurs. There could therefore be a significant cumulative impact to archaeological resources if any cultural resources (including subsurface and surface archaeological resources) or tribal cultural resources are disturbed and/or destroyed.

The general plans of each jurisdiction in the area, as well as state and federal law, require that archaeological resources be preserved in place whenever feasible, and require resources that cannot be preserved be properly recorded, evaluated, and curated. State law also requires consultation with tribes that have been traditionally and culturally affiliated with a region to identify and develop mitigation for any potential effects to tribal cultural resources. Therefore, although development is anticipated in the region and could occur in proximity to known archaeological resource sites and has the potential to affect tribal cultural resources, compliance with the applicable state and federal regulations and general plan policies would ensure that the potential for loss of archaeological resources and associated research potential and the potential for loss of tribal cultural resources in the cumulative scenario would remain less than significant. Thus, there is no cumulative impact to which the project could contribute. Further, the project site is not known to support any archaeological resources, and potential impacts to presently unknown archaeological resources would be reduced to a less-than-significant level with implementation of Mitigation Measure 7a.

Historic Resources

For the analysis of cumulative impacts to historic resources, the geographic area is the City of Grass Valley. The Grass Valley General Plan states that "Grass Valley exhibits the settlement and progression of western towns from the mid-nineteenth century through the early twentieth century. A sense of history is pervasive, from ever-present reminders of gold mining heritage to fine examples of architecturally interesting and significant buildings. Historic preservation and enhancement figure prominently in the General Plan and supporting implementation measures" (City of Grass Valley 1999).

A wide range of historical resources are present within the City of Grass Valley. These include historic buildings, such as those in the downtown area, and specifically within the Downtown Historic District, and individual residences throughout the City, mining-related structures and

sites, such as those within the Empire Mine State Park. Specifically, historic resources within the City of Grass Valley include:

- Properties listed on the NRHP – the Grass Valley Public Library, the Empire Mine, and Mount St. Mary's Academy and Convent.
- Properties listed on the CRHR – the Holbrooke Hotel, the North Star Mine Powerhouse, and the three previously identified as being listed on the NRHP
- Seven California Historical landmarks,
- Ten California Points of Historic Interest, and
- Seven Nevada County Historical Landmarks (City of Grass Valley 2011).

Several of the goals, objectives, policies, and actions identified in the City of Grass Valley 2020 General Plan require preservation of historic resources. These include Historical Policy 10 which requires development be designed to protect identified historic and prehistoric cultural resources from damage, destruction, or defacement, Historical Implementation Action 1 that requires the City to "maintain a Historic Resources Ordinance and active programs to implement City policy for historic conservation and enhancement." Compliance with these and other applicable General Plan policies and municipal code would be ensured as part of the City's standard process for reviewing development proposals and would ensure that historic resources within the City are preserved. Therefore, impacts to historic resources in the cumulative scenario would remain less than significant, and there is no cumulative impact to which the project could contribute. Further, there are no known historical resources within the project site.

7.4 MITIGATION MEASURES

Mitigation Measure 7a All construction workers shall receive worker cultural resources awareness training conducted by a qualified archaeologist, and shall receive a worker cultural resources awareness brochure prepared by the same qualified archaeologist. Worker cultural resources awareness training may also be conducted through a video created by a qualified archaeologist specifically for this project. The program shall include relevant information regarding sensitive tribal cultural resources, including applicable regulations, protocols for avoidance, and consequences of violating state laws and regulations. The worker cultural resources awareness training shall also describe appropriate avoidance and minimization measures for resources that have the potential to be located on the project site, and shall outline what to do and who to contact if any potential archaeological resources or artifacts

are encountered. The program shall also underscore the requirement for confidentiality and culturally appropriate treatment of any kind of significance related to Native Americans and behaviors, consistent with Native American tribal values. Worker cultural resources awareness training shall instruct workers to recognize potential cultural resources, such as the presence of discolored or dark soil, fire-affected material, concentrations of lithic materials, or other characteristics observed to be atypical of the surrounding area; lithic or bone tools that appear to have been used for chopping, drilling, or grinding; projectile points; fired clay ceramics or non-functional items; non-local high-quality materials such as chert and obsidian; and historic artifacts such as glass bottles and shards, ceramic material, building or domestic refuse, ferrous metal, or old features such as concrete foundations or privies.

Prior to issuance of a grading permit, the City of Grass Valley shall verify that project construction documents include the following note: "If any cultural resources, such as structural features, mining equipment, unusual amounts of bone or shell artifacts, or architectural remains, are encountered during any construction activities, the contractor shall suspend all work within 100 feet of the find and immediately notify the City's Community Development Director." Further, the project applicant shall undertake the following:

- Retain a qualified archaeologist to conduct an investigation of the site as needed to assess the resources (i.e., whether it is a "historical resource" or a "unique archaeological resource") and to provide management recommendations should potential impacts to the resource be found to be significant (possible management recommendations for historical or unique archaeological resources could include resource avoidance or data recovery excavations where avoidance is infeasible in light of project design or layout, or is unnecessary to avoid significant effects).
- Consult with the United Auburn Indian Community (UAIC) to determine if the find is a tribal cultural resource. If so, consultation with the UAIC shall be consistent with the requirements of California Public Resources Code Sections 21084.3(a) and (b) and CEQA Guidelines Section 15370, and shall include consideration of requiring compensation for the impact by replacing or providing substitute resources or environments.

- As warranted by any cultural resources found on site, prepare reports for resources identified as potentially eligible for listing in the California Register of Historical Resources in consultation with the State Historic Preservation Officer, and if applicable, tribal representatives.

7.5 REFERENCES CITED

16 U.S.C. 470–470x-6. National Historic Preservation Act of 1966, as amended.

36 CFR 60. National Register of Historic Places.

36 CFR 800.1–800.16 and Appendix A. Protection of Historic Properties.

48 FR 44720–44726. "The Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act." April 24, 1998.

ACS (Anthropological Studies Center) Sonoma State University. 2008. *Historic Context for Empire Mine Historic District, Nevada County, California.* July 2008.

City of Grass Valley. 1999. *Grass Valley 2020 General Plan*. Prepared by Quad Knopf on behalf of the City of Grass Valley. Adopted 1999.

City of Grass Valley. 2011. *Draft Environmental Impact report for the Proposed Grass Valley Redevelopment Plan Fourth Amendment*. January 2011.

Quad Knopf. 1998. *Grass Valley General Plan Update Background Report*. November 1998.

CHAPTER 8
TRANSPORTATION

This section describes the results of the transportation impact analysis conducted to evaluate potential transportation-related impacts of the proposed Dorsey Marketplace (proposed project) on roadways, intersections, transit, bicycle, and pedestrian movements. The analysis includes a discussion of existing and cumulative transportation and circulation conditions as well as potential impacts from construction and operation of the project. Quantitative transportation analyses have been conducted for the following scenarios: Existing (without project), Existing Plus Project, Year 2030 (no project), and Year 2030 Plus Project.

Alternative A site plan shows a total of 178,960 square feet for commercial uses however the analysis in this EIR is based on an assumption that 181,900 square feet would be developed. This would allow the project developer to make minor modifications to the site plan as project designs are finalized. Alternative A would provide for up to 90 multiple-family residential units, a 3,200-sqaure foot clubhouse, and approximately 178,960 square feet of commercial space. Alternative B would provide ~~171~~ 172 apartments, a 3,200 square foot clubhouse, approximately 104,350 square feet of commercial space, and approximately 8,500 square feet of office space. The analysis of Alternative B in the Transportation Impact Analysis Report (Appendix G) and the Draft EIR as published in March 2019 is based on an assumption that 171 multiple-family residential units would be constructed. As discussed in Final EIR Section 1.5, the description of Alternative B was updated to reflect construction of 172 residential units. As part of preparation of the Final EIR, text has been added throughout Section 8.3 Impacts demonstrating that the increase of a single residential unit would not alter the conclusions and severity of impacts identified in this chapter.

Two comments were received from the California Department of Transportation (Caltrans) in response to the Notice of Preparation regarding the extent of the study intersections contained in the Transportation Impact Analysis Report. One comment was received from the Wolf Creek Community Alliance regarding the project's consistency with the City's goals and objectives regarding walking and bicycle trails as well as non-vehicular traffic plans such as the Wolf Creek Parkway and others implemented by the Bear Yuba Land Trust. One comment was received from a business owner on Spring Hill Drive, discussing the limitations and condition of Spring Hill Drive. The Notice of Preparation and comments received in response to it are included in Appendix A.

A copy of the Transportation Impact Analysis Report, prepared by GHD is included in Appendix G. Note that the Transportation Impact Analysis Report switches Alternative A and Alternative B compared to this EIR – it treats the alternative that includes 171 apartments, 8,500 square feet of office space, and 104,350 square feet of commercial space as Alternative A and the alternative that includes 90 apartments and 178,960 square feet of commercial space as Alternative B. Consistent with the rest

of this Draft EIR, in this chapter Alternative A is defined as the project that includes apartments and commercial space and Alternative B is defined as the project that includes apartments, office space, and commercial space. Further, Alternative B includes one additional residential unit (172 total) than was evaluated in the Transportation Impacts Analysis Report. However, the additional residential unit would not alter the conclusions and severity of impacts identified in this Transportation Impacts Analysis Report.

8.1 ENVIRONMENTAL SETTING

Study Area

For traffic analysis purposes, a set of intersections and mainline and ramp segments were selected for inclusion in the study area. The study area was identified based on knowledge of local traffic patterns and represents those locations that could potentially be impacted by the proposed project. The following locations were identified as part of the study area:

- Study Intersections
    1. Nevada City/Olympia Drive and Brunswick Road
    2. State Route (SR) 49/20 Southbound (SB) Off-Ramp and Brunswick Road
    3. SR 20/49 Northbound (NB) Ramps and Brunswick Road
    4. Sutton Way and Brunswick Road
    5. Main Street and Dorsey Drive
    6. Catherine Lane and Dorsey Drive
    7. SR 20/49 SB On-Ramp/Joerschke Drive and Dorsey Drive
    8. SR 20/49 NB Ramps and Dorsey Drive
    9. Apartment Driveway and Dorsey Drive
    10. Sutton Way and Dorsey Drive
    11. Sutton Way and Idaho Maryland Road
    12. Brunswick Road and Idaho Maryland Road
    13. Spring Hill Drive and Idaho Maryland Road
    14. Centennial Drive and Idaho Maryland Road
    15. SR 20/49 SB Ramps/Idaho Maryland Road and Main Street
    16. SR 20/49 NB Ramps and Idaho Maryland Road
    17. SR 20/49 SB Off-Ramp/Tinloy Street and Bennett Street

18. SR 20/49NB On-Ramp/Hansen Way and Bennett Street

- Mainline and Ramp Segments
  1. SR 20/49 NB/ Eastbound (EB) south of Bennett Street - Mainline
  2. Bennett Street NB/EB On-Ramp – Weave
  3. SR 20/49 NB/EB Off-Ramp – Weave
  4. Idaho Maryland Road NB/EB Off-Ramp – Weave
  5. Idaho Maryland Road NB/EB On-Ramp – Weave
  6. SR 20/49 NB/EB between Idaho Maryland Road and Dorsey Drive – Mainline
  7. Dorsey Drive NB/EB Off-Ramp – Weave
  8. Dorsey Drive NB/EB On-Ramp – Weave
  9. SR 20/49 NB/EB between Dorsey Drive and Brunswick Road – Mainline
  10. Brunswick Road NB/EB Off-Ramp – Weave
  11. Brunswick Road NB/EB On-Ramp – Merge
  12. SR 20/49 NB/EB north of Brunswick Road
  13. Brunswick SB/Westbound (WB) Off-Ramp – Diverge
  14. Brunswick SB/WB On-Ramp – Weave
  15. SR 20/49 SB/WB north of Brunswick Road
  16. Dorsey Drive SB/WB Off-Ramp – Weave
  17. Dorsey Drive SB/WB On-Ramp – Weave
  18. SR 20/49 SB/WB between Dorsey Drive and Idaho Maryland Road/Main Street – Mainline
  19. Idaho Maryland Road/Main Street SB/WB Off-Ramp – Weave
  20. Idaho Maryland Road/Main Street SB/WB On-Ramp – Weave
  21. SR 20/49 SB/WB between Idaho Maryland Road/Main Street and Bennett Street – Mainline
  22. Bennett Street SB/WB Off-Ramp – Weave
  23. SR 20/49 SB/WB south of Bennett Street – Mainline

Pedestrian and Bicycle Facilities

The pedestrian system near the site consists primarily of the sidewalk system along City streets. The only formal trails in Grass Valley are the Empire Mine State Park and the Litton Trail (City of Grass Valley 1999). Dorsey Drive has continuous sidewalks on both sides of the road. Both ramps of SR49/20 have marked crosswalks; the next closest crosswalks are at East Main Street and Sutton Way. Spring Hill Drive maintains sidewalks on both sides on the street from Idaho Maryland Road to the project site.

Currently, there are on-street bike lanes around the City, including on Ridge Road from Hughes Road to Nevada Union High School and on East Main from Hughes Road to the Nevada City highway (City of Grass Valley 1999). The Nevada County Master Bicycle Plan, most recently updated in 2013, identifies bike lanes within the City of Grass Valley; the City adopted this plan in 2013. There are existing Class II bike lanes on Dorsey Drive and portions on Sutton Way but no facilities on Idaho Maryland Road or Springhill Drive.

Transit Services

Transit services in western Nevada County are provided through a joint powers agreement between Nevada County, the City of Grass Valley and Nevada City that was executed in October 2003 (LSC Transportation Consultants Inc. 2016). The Nevada County Transit Services Division (TSD) is responsible for the oversight of the western Nevada County public transit system, which includes two main programs: Gold Country Stage and Gold Country Lift. Gold Country Stage is a fixed-route operated directly by TSD using County employees and Gold Country Lift is a demand-response service providing paratransit required under the Americans with Disabilities Act (ADA) as well as additional services. The Gold Country Lift is operated by Paratransit Services Inc. who is under contract to the TSD.

Gold Country Stage operates six routes along the SR 49 corridor between Auburn and Nevada City to serve the Nevada City/Grass Valley area and unincorporated Western Nevada County. The main transfer points for transit in Grass Valley are the Tinloy Street Transit Center (serving all routes), the Fowler Center and City Hall (LSC Transportation Consultants Inc. 2016). The Tinloy Street Transit Center is located approximately 1.11 miles southwest of the project site. Generally, the six routes include the following:

- **Route 1 Nevada City/Grass Valley:** This route connects Nevada City and Grass Valley from the Nevada County Government Center to the Tinloy Street Transit Center (the first two runs at 6:15 a.m. and 7:15 a.m. start at the Gold Country Staging offices). Service on this route is offered on an hourly basis between 6:15 a.m. and 8:15 p.m. Monday through Friday and 7:15 a.m. to 5:30 p.m. on Saturday.

- **Route 2 Ridge Road:** This route begins and ends at the Tinloy Street Transit Center and operates a loop in Grass Valley via Ridge Road, Sierra College Drive, and Hughes Road. Service is offered between 7:15 a.m. and 6:56 p.m. Monday through Friday and from 7:15 a.m. to 2:55 p.m. on Saturday.
- **Route 3 Grass Valley Loop:** This route begins and ends at the Tinloy Street Transit Center and serves the lower Grass Valley area. Service is offered every hour between 6:45 a.m. and 7:45 p.m. Monday through Friday and between 8:00 a.m. and 4:45 p.m. on Saturday. Additionally, this route travels to Loma Rica six times per day between 8:28 a.m. and 5:53 p.m. Monday through Friday.
- **Route 4 Brunswick Basin:** This route runs between the Tinloy Street Transit Center in Grass Valley and loops past Sierra College, Gold Country Center and the Fowler Center hourly between 6:15 a.m. and 8:00 p.m. Monday through Friday, and between 7:15 a.m. and 4:45 p.m. on Saturday.
- **Route 5 Auburn:** This route provides service from Grass Valley to Auburn (Auburn Station) via SR 49. This route serves Nevada City at 5:30 a.m. only and departs the Tinloy Street Transit Center in Grass Valley at 6:00 a.m. Six round-trip runs are offered each day between 5:30 a.m. and 7:30 p.m., including an express trip at 9:00 a.m. that offers limited stops along the SR 49 corridor.
- **Route 6 Penn Valley:** This route begins at the Tinloy Street Transit Center in Grass Valley and serves the Rough and Ready and Penn Valley communities to the west via the Rough and Ready Highway terminating at the Wildwood Center in Penn Valley. Service is offered between 6:30 a.m. and 8:00 p.m. Monday through Friday and four times per day between 7:00 a.m. and 5:15 p.m. on Saturday.

From July 2014 to June 2015 186,667 riders utilized the Gold Country Stage transit system with Route 1 being the most utilized at 61,852 riders or 33.1% of the total (LSC Transportation Consultants Inc. 2016). Peak ridership occurred during October 2014 with a total of 18,599 riders (LSC Transportation Consultants Inc. 2016).

Gold Country Lift provides ADA paratransit service for those who cannot use the Gold Country Stage transit system. Services are offered from 6:35 a.m.to 8:00 p.m. Monday through Friday and between 7:30 a.m. and 5:00 p.m. on Saturday. The paratransit program operates within a specific Paratransit Service Area, which has a main ADA corridor within 0.75 mile from the fixed routes and service is provided to an outlying defined paratransit service area in the western portion of the county as resources allow. From July 2014 to June 2015 39,625 riders utilized the Gold Country Lift transit system with June 2015 providing the highest number of month rides at 3,713 or 9.4% of the total (LSC Transportation Consultants Inc. 2016).

Level of Service

To assess the quality of existing traffic conditions, operating levels of service (LOS) were calculated at each study intersection. LOS is a qualitative measure of traffic operating conditions whereby a letter grade "A" through "F," corresponding to progressively worsening traffic operating conditions, is assigned to an intersection.

Table 8-1 presents the characteristics associated with each LOS grade. As shown in the table, LOS A, B, and C are considered satisfactory to most motorists, and LOS D is marginally acceptable. LOS E and F are associated with increasingly long delays and congestion and are unacceptable to most motorists.

Table 8-1
Level of Service Definitions

LOS	Signalized Intersection	Unsignalized Intersection	Roadway Conditions
A	Uncongested operations, all queues clear in a single-signal cycle. Delay < 10.0 sec	Little or no delay. Delay < 10 sec/veh	Completely free flow.
B	Uncongested operations, all queues clear in a single cycle. Delay > 10.0 sec and < 20.0 sec	Short traffic delays. Delay > 10 sec/veh and < 15 sec/veh	Free flow, presence of other vehicles noticeable.
C	Light congestion, occasional backups on critical approaches. Delay > 20.0 sec and < 35.0 sec	Average traffic delays. Delay > 15 sec/veh and < 25 sec/veh	Ability to maneuver and select operating speed affected.
D	Significant congestion of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35.0 sec and < 55.0 sec	Long traffic delays. Delay > 25 sec/veh and < 35 sec/veh	Unstable flow, speeds and ability to maneuver restricted.
E	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay > 55.0 sec and < 80.0 sec	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/veh and < 50 sec/veh	At or near capacity, flow quite unstable.
F	Total breakdown, stop-and-go operation. Delay > 80.0 sec	Intersection blocked by external causes. Delay > 50 sec/veh	Forced flow, breakdown.

Source: TRB 2000.
Notes: LOS = level of service; sec = seconds; sec/veh = seconds per vehicle.
Overall LOS for unsignalized intersections is weighted average of delays experienced by all motorists yielding the right of way, excluding through traffic.

Existing Levels of Service

Existing No Project weekday AM and PM peak hour intersection traffic operations were quantified utilizing the existing traffic volumes and lane geometrics and controls. Figure 8-1 and Table 8-2 identify the Existing No Project study intersection LOS conditions. The LOS for two-way stop controlled intersections is based on the worst minor street approach. The LOS for intersections with other control types is based on the average of all approaches. Where an unsignalized intersection operates at an unacceptable LOS, a traffic signal warrant analysis was completed using the criteria established in the California Manual on Uniform Traffic Control Devices (MUTCD) based on the peak hour traffic volume (Warrant 3).

Table 8-2
Existing Level of Service

#	Intersection	Control Type	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	*LOS*	*Warrant Met*	*Delay*	*LOS*	*Warrant Met*
1	Brunswick Rd/Olympia Dr & Nevada City Hwy	Signal	D	35.6	D	-	39.1	D	-
2	Brunswick Rd & SR 20/49 SB/WB Off Ramp/Maltman Dr	Signal	D	33.1	C	-	36.3	D	-
3	Brunswick Rd & SR 20/49 NB/EB Ramps	Signal	D	14.4	B	-	12.5	B	-
4	Brunswick Rd & Sutton Way	Signal	D	29.4	C	-	40.6	D	-
5	Dorsey Dr & Main St	Signal	D	18.2	B	-	22.5	C	-
6	Dorsey Dr & Catherine Lane	TWSC	D	16.6	C	-	19.7	C	-
7	Dorsey Dr & SR 20/49 SB/EB On-Ramp/Joerschke Dr	Signal	D	8.3	A	-	11.5	B	-
8	Dorsey Dr & SR 20/49 NB/WB Ramps	Signal	D	16.5	B	-	15.0	B	-
9	Dorsey Dr & Apartment Driveway	TWSC	D	10.6	B	-	11.8	B	-
10	Dorsey Dr & Sutton Way	AWSC	D	10.0	A	-	13.1	B	-
11	Idaho Maryland Rd & Sutton Way	AWSC	D	9.3	A	-	11.1	B	-
12	**Idaho Maryland Rd & Brunswick Rd**	**TWSC**	**D**	16.4	C	**-**	**122.1**	**F**	**NO**
13	Idaho Maryland Rd & Spring Hill Dr	TWSC	D	11.8	B	-	15.2	C	-
14	Idaho Maryland Rd & Centennial Dr	TWSC	D	12.2	B	-	16.8	C	-
15	Idaho Maryland Rd/Main St & SR 20/49 SB/EB Ramps/Main St	RNDBT	D	7.8	A	-	9.9	A	-
16	Idaho Maryland Rd & SR 20/49 NB Ramps	AWSC	D	14.5	B	-	29.4	D	-
17	Bennett St & SR 20/49 SB Off-Ramp/Tinloy St	TWSC	D	14.5	B	-	17.8	C	-
18	Bennett St & SR 20/49 On-Ramp/Hansen Way	AWSC	D	14.9	B	-	14.0	B	-

Source: Appendix G

As shown in Table 8-2, one intersection currently operates at an unacceptable LOS during the PM peak hour: Intersection 12 – Idaho Maryland Road and Brunswick Road.

Existing Traffic Volumes

Due to the project's site close proximity to SR 20/49, Table 8-3 below outlines the Existing No Project ramp merge, diverge and freeway mainline operations.

Table 8-3
Existing SR 20/49 Traffic Volumes

#	Interchange Location	Segment Type	Target LOS	# of Lanes	AM Peak Hour			PM Peak Hour		
					Volume	*Density*	*LOS*	*Volume*	*Density*	*LOS*
1	North of Brunswick NB	Freeway	D	2	991	9.3	A	1,762	16.4	B
2	Brunswick On-Ramp NB	Merge	D	1	219	11.9	B	397	18.9	B
3	Brunswick Loop On-Ramp NB	Merge	D	1	87	9.7	A	138	16.4	B
4	Dorsey to Brunswick NB	Weave	D	1	-	10.1	B	-	12.3	B
5	Idaho Maryland to Dorsey NB	Weave	D	1	-	14.2	B	-	14.8	B
6	Bennett to Idaho Maryland NB	Weave	D	1	-	24.1	C	-	18.0	B
7	South of Bennett NB	Freeway	D	2	1,648	16.3	B	1,626	16.0	B
8	North of Brunswick SB	Freeway	D	2	1,625	16.0	B	1,242	12.3	B
9	Brunswick Off-Ramp SB	Diverge	D	1	385	14.1	B	521	4.8	B
10	Brunswick Loop On-Ramp SB	Merge	D	1	208	15.9	B	411	16.5	B
11	Brunswick to Dorsey SB	Weave	D	1	-	10.2	B	-	9.9	A
12	Dorsey to Idaho Maryland SB	Weave	D	1	-	11.8	B	-	14.4	B
13	Idaho Maryland to Bennett SB	Weave	D	1	-	14.4	B	-	18.4	B
14	South of Bennett SB	Freeway	D	2	1,379	13.6	B	1,811	17.9	B

Source: Appendix G

As presented in Table 8-3, all study ramps and freeway segments are currently found to operate at an acceptable LOS.

8.2 REGULATORY SETTING

Federal Regulations

There are no known federal standards that would affect the transportation and circulation aspects of the proposed project.

State Regulations

Transportation Concept Report

The Transportation Concept Report (TCR) is Caltrans' long-range (20-year) planning document for each State Highway route. The TCR identifies existing route conditions and future needs, including existing and forecasted travel data, a concept LOS standard, and the facility needed to maintain the concept LOS and address mobility needs over the next 20 years. Segment 16 of the *Transportation Concept Report for State Route 20* (Caltrans 2013) covers the portion of SR 20 from the junction of SR 49 South to the junction of SR 49 North, which runs parallel to the west edge of the project site. Segment 7 of the *Transportation Concept Report for State Route 49* (Caltrans 2000) covers the segment of SR 49 from the Placer and Nevada County line to the junction of SR 20, just south of the City.

Caltrans Traffic Study Guidelines

The *Guide for the Preparation of Traffic Impact Studies* (Caltrans 2002) includes the following generalized statement regarding target LOS goals for Caltrans facilities. Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities, however, Caltrans acknowledges that this may not be always feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing Measure of Efficiency should be maintained.

Local Regulations

Western Nevada County Regional Transportation Mitigation Fee

The Nevada County Transportation Commission (NCTC), in partnership with Nevada County, Nevada City, and the City of Grass Valley established the Western Nevada County Regional Transportation Mitigation Fee program in 2001. Under this program, development impact fees are collected to help fund construction of the regional system of roads, streets, and highways needed to accommodate growth in western Nevada County. Nevada City and the City of Grass Valley also have adopted their own transportation mitigation fees to fund transportation improvements in each city. All three fee programs were updated in 2008 and again in 2016 to reflect changes in demographic and economic assumptions and associated changes in transportation improvement needs and funding opportunities for these improvements (NCTC 2016).

Nevada County Bicycle Master Plan

The ~~Nevada County Transportation Commission's (~~NCTC's~~)~~ *Nevada County Bicycle Master Plan* (NCTC 2013) aims to provide safe, well-maintained bikeways and support facilities in order to improve the bicycling environment in Nevada County and promote alternative modes of transportation. This plan includes goals, policies and objectives for guiding plan implementation; details of existing conditions in the County; a demand analysis; recommendations for bikeway improvements, including bicycle parking, and education, outreach and encouragement programs; and an implementation strategy including a project priority list, feasibility analysis and cost estimates (NCTC 2013).

Nevada County Pedestrian Improvement Plan

The NCTC's *Nevada County Pedestrian Improvement Plan* (NCTC 2011) aims to influence and improve pedestrian infrastructure, policies, programs and development standards to make walking more safe, comfortable and convenient for all pedestrians. The Plan includes five chapters: Existing conditions, Goals and Policies, Proposed Pedestrian Projects, Implementation and Design Guidance.

City of Grass Valley Traffic Impact Fee

The City of Grass Valley has adopted the Grass Valley Traffic Impact Fee program to fund transportation improvements that are included in the City's Capital Improvement Program. The fee program was adopted in 2008 and updated in 2016, concurrent with the updates to the Western Nevada County Regional Transportation Mitigation Fee program (City of Grass Valley 2016). Under the Traffic Impact Fee program, new development must pay fees to support implementation of the transportation improvements included in the City's Capital Improvement Program (CIP).

Grass Valley Parks and Recreation Master Plan

The *Grass Valley Parks and Recreation Master Plan* (City of Grass Valley 2001) contains a bikeway and trails category that provides goals for the provision of bike lanes, multi-use pedestrian paths and trails in the City. The plan aims to add on-street bike lanes to all arterial and collector streets; establish multi-use bike/pedestrian paths to link neighborhoods to community destinations including park and recreation facilities, schools, town center, and the transit system; and establish trails to provide access to and within parks and open space and link neighborhoods with parks and recreation facilities.

City of Grass Valley 2020 General Plan

The Grass Valley General Plan Circulation (C) Element defines the transportation facilities in the City and includes goals (G), objectives (O), policies (P), and implementation measures (I) to improve the City's circulation system. The goals of the Circulation Element are to promote safe, efficient, and reliable movement of people and goods; facilitate some transition to alternate modes of transportation; and provide an adequate level of transportation services for all people traveling in and through the City (City of Grass Valley 1999). The following goals, objectives, policies and implementation measures are applicable to the proposed project:

1-CG: Provide a circulation system that utilizes a variety of transportation modes, including alternative means of transportation.

1-CO: Development of a viable pedestrian and bicycle transportation network (sidewalks, paths, lanes and trails) providing alternatives to motorized vehicular transportation.

2-CG: Ensure that street and roadway improvements complement and support land use goals, objectives, policies and plans.

5-CO: Convenient, safe and functional facilities for pedestrians, bicyclists and equestrians.

3-CG: Provide for the safe and efficient movement of people and goods in a manner that respects existing neighborhoods and the natural environment.

9-CO: Use of traffic calming techniques to protect neighborhoods and residents from adverse traffic impacts.

5-CG: Maintain adequate emergency access.

12-CO: Improvement and maintenance of adequate emergency access throughout the City.

2-CP: Plan for multi-purpose transportation/recreation bicycle and pedestrian facilities to optimize facility usage and enhance potential funding.

6-CP: Locate transit stops and park and ride facilities near freeway interchanges and in conjunction with higher density residential and mixed-use developments.

7-CI: Continue to update the Capital Improvement Program to implement policy which strives to maintain LOS "D" at all locations during the weekday p.m. peak hour. Define "normally accepted maximum" improvements that are consistent with the character and terrain of Grass Valley. If forecasted traffic volumes cannot maintain LOS "D", the City Council may consider additional "extraordinary" improvements. The City Council may determine, on a case by case basis, that "extraordinary" improvements are not feasible or desirable and may relax the LOS "D" standard for a particular

intersection or roadway segment. In considering exceptions to the LOS "D" standard, the City shall consider the following factors:

- The number of hours per day that the intersection or roadway segment would operate at conditions worse than LOS "D".
- The ability of improvement to reduce peak hour delay and improve traffic operations.
- The impact on accessibility to surrounding projects.
- The right-of-way needs and the physical impact on surrounding properties.
- The visual aesthetics of the required improvements and its impact on community identity and character.
- Environmental impacts including air quality and noise impacts.
- Construction and right-of-way acquisition costs.
- Impacts on pedestrian and bicycle accessibility and safety.
- The impacts of the required construction phasing and traffic maintenance.

In no case should the City plan for worse than LOS "E" at any intersection or roadway segment during the afternoon peak hour.

8.3 IMPACTS

Methods of Analysis

The following analysis of impacts to transportation is based on the Transportation Impact Analysis Report provided in Appendix G.

Trip Generation

To determine the number of vehicle trips that may result from development of commercial space under either Alternative A or Alternative B, peak hour traffic counts were conducted at three local shopping centers that have uses similar to those anticipated under the proposed project. The average trip generation observed at the three existing shopping centers is higher than the trip generation rates published in the Institute of Transportation Engineers (ITE) publication Trip Generation, 9th Edition. The average trip generation rate observed at the existing shopping centers has been applied to the commercial portions of the proposed project. The industry-standard ITE trip generation rates have been applied to the residential uses under both Alternative A and Alternative B and to the office uses proposed under Alternative B. Table 8-4

provides the trip generation estimated for Alternative A and Table 8-5 provides the trip generation estimated for Alternative B.

Table 8-4
Alternative A Trip Generation

Land Use Category (ITE Category)	Unit	AM Peak Hour Trip Rate/Unit			PM Peak Hour Trip Rate/Unit		
		Total	*In %*	*Out %*	*Total*	*In %*	*Out %*
Apartment (220)	DU	0.51	20	80	0.62	65	35
Shopping Center (820)	ksf	2.80	62	38	6.63	48	52
Project ~~Name~~Component	**Quantity**	**AM Peak Hour Trips**			**PM Peak Hour Trips**		
		Total	*In*	*Out*	*Total*	*In*	*Out*
Multifamily Residential	90	46	9	37	56	36	20
To Shopping Center		-1	0	-1	-21	-11	-10
Market Place	181.9	510	316	194	1,207	579	627
To Residential		-1	-1	0	-21	-10	-11
Project Trips		554	324	230	1,220	594	626
Shopping Center Pass-by (15% for AM, 30% for PM reduction)		-76	-47	-29	-356	-171	-185
Net New Project Trips		**478**	**277**	**200**	**865**	**424**	**441**

Notes: ITE = Institute of Transportation Engineers; DU = dwelling unit; ksf = thousand square feet.
Source: Appendix G

As shown in Table 8-4 Alternative A is projected to generate 478 trips and 865 trips in the AM and PM peak hours, respectively. Table 8-5 shows that Alternative B is projected to generate 358 AM peak hour trips and 527 PM peak hour trips.

Table 8-5
Alternative B Trip Generation

Land Use Category (ITE Category)	Unit	AM Peak Hour Trip Rate/Unit			PM Peak Hour Trip Rate/Unit		
		Total	*In %*	*Out %*	*Total*	*In %*	*Out %*
Apartment (220)	DU	0.46	23	77	0.56	63	37
Shopping Center (820)	ksf	2.80	62	38	6.63	48	52
Office (710)	ksf	4.06	86	14	1.29	16	84
Project ~~Name~~Component	**Quantity**	**AM Peak Hour Trips**			**PM Peak Hour Trips**		
		Total	*In*	*Out*	*Total*	*In*	*Out*
Multifamily Residential	~~171~~172	79	18	61	~~95~~96	~~60~~61	35
To Shopping Center		0	0	0	-36	-18	-18
To Office		0	0	0	0	0	0
Market Place	104.4	293	181	111	692	332	360
To Residential		0	0	0	-36	-18	-18
To Office		-2	-1	-1	-1	-1	0
General Office	8.5	34	30	5	11	2	9

Table 8-5
Alternative B Trip Generation

To Shopping Center		-2	-1	-1	-1	0	-1
To Residential		0	0	0	0	0	0
Project Trips		402	227	175	724	357	367
Shopping Center Pass-by (15% for AM, 30% for PM reduction)		-44	-27	-17	-197	-94	-103
Net New Project Trips		**358**	**200**	**158**	**528~~7~~**	**26~~43~~**	**264**

Notes: Institute of Transportation Engineers; DU = dwelling unit; ksf = thousand square feet.
Source: Appendix G

With the addition of one residential unit to Alternative B, there would be no change to the AM peak hour trips and an increase of one PM Peak Hour trip. This would result in 96 PM peak hour trips attributed to the multi-family residential use and a project total of 528 PM peak hour trips. This is an increase of 0.2%, which would not alter the conclusions regarding delay and LOS at each roadway facility evaluated in this EIR.

Significance Criteria

Potential significant impacts associated with traffic have been evaluated using the following criteria, as identified in Appendix G of the CEQA Guidelines:

The analysis in the following text evaluates the potential for the project to result in significant transportation and circulation impacts related to the following criteria. Would the project:

- Result in an increase in traffic that is substantial in relation to the existing and/or planned future year traffic load and capacity of the roadway system?
- Exceed a level of service standard established by the local General Plan for roads affected by project traffic?
- Increase impacts to vehicle safety due to roadway design features or incompatible uses?
- Result in inadequate emergency access or access to nearby uses?
- Create hazards or barriers for pedestrians or bicyclists?
- Conflict with adopted policies, plans, or programs supporting alternative transportation or otherwise decrease the performance or safety of such facilities?
- Cause a change in air traffic patterns, including either an increase in traffic levels or a change in location resulting in substantial safety risks?
- Result in increased vehicle circulation or congestion due to a lack of sufficient parking capacity to support the proposed land uses?

Impact Analysis

Impact 8-1: Would the project result in an increase in traffic that is substantial in relation to the existing traffic volumes and capacity on SR 20/49?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A

Alternative A proposes approximately 180,000 square feet of commercial space and 90 residential units. Table 8-6 identifies the existing plus Alternative A peak hour traffic volumes on SR 20/49. The target LOS for all facilities included in Table 8-6 is LOS D.

Table 8-6
Existing Plus Alternative A SR 20/49 Traffic Volumes

#	Interchange Location	Facility	Existing						Existing Plus Alternative A					
			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
			Volume	*Density*	*LOS*	*Volume*	*Density*	*LOS*	*Volume*	*Density*	*LOS*	*Volume*	*Density*	*LOS*
1	North of Brunswick NB	Freeway	991	9.3	A	1,762	16.4	B	991	9.3	A	1,762	16.4	B
2	Brunswick On-Ramp NB	Merge	219	11.9	B	397	18.9	B	219	11.9	B	397	18.9	B
3	Brunswick Loop On-Ramp NB	Merge	87	9.7	A	138	15.1	B	87	9.7	A	138	15.1	B
4	Dorsey to Brunswick NB	Weave	-	10.1	B	-	12.3	B	-	10.3	B	-	14.8	B
5	Idaho Maryland to Dorsey NB	Weave	-	14.2	B	-	14.8	B	-	14.9	B	-	15.4	B
6	Bennett to Idaho Maryland NB	Weave	-	24.1	C	-	18.0	B	-	18.9	B	-	18.2	B
7	South of Bennett NB	Freeway	1,648	16.3	B	1,626	16.0	B	1,699	16.8	B	1,687	16.6	B
8	North of Brunswick SB	Freeway	1,625	16.0	B	1,242	12.3	B	1,625	16.0	B	1,242	12.3	B
9	Brunswick Off-Ramp SB	Diverge	385	14.1	B	521	4.8	A	385	14.1	B	521	10.2	B
10	Brunswick Loop On-Ramp SB	Merge	208	15.9	B	411	16.5	B	224	16.0	B	432	12.8	B
11	Brunswick to Dorsey SB	Weave	-	10.2	B	-	9.9	A	-	11.0	B	-	10.1	B
12	Dorsey to Idaho Maryland SB	Weave	-	11.8	B	-	14.4	B	-	~~14.9~~12.6	B	-	~~19.0~~15.2	B
13	Idaho Maryland to Bennett SB	Weave	-	14.4	B	-	18.4	B	-	14.9	B	-	19.0	B
14	South of Bennett SB	Freeway	1,379	13.6	B	1,811	17.9	B	1,447	14.3	B	1,878	18.5	C

Source: Appendix G

As shown in Table 8-6, the freeway segments and ramps would continue to operate at an acceptable LOS under existing plus Alternative A conditions. Because the project-generated traffic under Alternative A would not cause any of the freeway segments or ramps to operate at an unacceptable LOS, the impact of Alternative A under existing plus project conditions would be **less than significant**.

Alternative B

Alternative B proposes approximately 104,350 square feet of commercial space, 8,500 square feet of office space, and ~~171~~ 172 residential units. Table 8-7 identifies the peak hour average delay and LOS on SR 20/49 that would result from the addition of project-generated traffic under existing plus Alternative B conditions.

Table 8-7
Existing Plus Alternative B SR 20/49 Traffic Volumes

#	Interchange Location	Facility	Existing						Existing Plus Alternative B					
			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
			Volume	*Density*	*LOS*	*Volume*	*Density*	*LOS*	*Volume*	*Density*	*LOS*	*Volume*	*Density*	*LOS*
1	North of Brunswick NB	Freeway	991	9.3	A	1,762	16.4	B	991	9.3	A	1,762	16.4	B
2	Brunswick On-Ramp NB	Merge	219	11.9	B	397	18.9	B	219	11.9	B	397	18.9	B
3	Brunswick Loop On-Ramp NB	Merge	87	9.7	A	138	15.1	B	87	9.7	A	138	15.1	B
4	Dorsey to Brunswick NB	Weave	-	10.1	B	-	12.3	B	-	10.4	B	-	15.2	B
5	Idaho Maryland to Dorsey NB	Weave	-	14.2	B	-	14.8	B	-	15.3	B	-	15.9	B
6	Bennett to Idaho Maryland NB	Weave	-	24.1	C	-	18.0	B	-	19.4	B	-	18.7	B
7	South of Bennett NB	Freeway	1,648	16.3	B	1,626	16.0	B	1,723	17.0	B	1,701	16.8	B
8	North of Brunswick SB	Freeway	1,625	16.0	B	1,242	12.3	B	1,625	16.0	B	1,242	12.3	B
9	Brunswick Off-Ramp SB	Diverge	385	14.1	B	521	4.8	A	385	14.1	B	521	10.2	B
10	Brunswick Loop On-Ramp SB	Merge	208	15.9	B	411	16.5	B	230	16.1	B	445	12.9	B
11	Brunswick to Dorsey SB	Weave	-	10.2	B	-	9.9	A	-	11.0	B	-	10.2	B
12	Dorsey to Idaho Maryland SB	Weave	-	11.8	B	-	14.4	B	-	12.4	B	-	16.2	B
13	Idaho Maryland to Bennett SB	Weave	-	14.4	B	-	18.4	B	-	14.9	B	-	20.0	C
14	South of Bennett SB	Freeway	1,379	13.6	B	1,811	17.9	B	1,411	13.9	B	1,925	19.0	C

Source: Appendix G

As shown in Table 8-7, the study intersections would continue to operate at an acceptable LOS under existing plus Alternative B conditions. Therefore, the impact of the Alternative B would be **less than significant**.

Impact 8-2: Would the project result in an increase in traffic that is substantial in relation to the existing traffic volumes and capacity on City of Grass Valley roadways and intersections?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially Significant	Potentially Significant
Mitigation measures:	8a and 8b	8a
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A

Development of Alternative A would generate traffic associated with residents, employees, and customers accessing the project site. This would affect intersection operations. Table 8-8 presents the Transportation Impact Analysis Report forecasts for the volume-to-capacity ratio and LOS on study area intersections under existing plus Alternative A conditions. The LOS for two-way stop controlled intersections is based on the worst minor street approach. The LOS for intersections with other control types is based on the average of all approaches. The traffic signal warrant analysis is based on the peak hour signal warrant from the California Manual on Uniform Traffic Control Devices (MUTCD Warrant 3).

Table 8-8
Existing Plus Alternative A Intersection Level of Service

#	Intersection	Control Type	Target LOS	Existing						Existing Plus Alternative A					
				AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met	Delay	LOS	Warrant Met	Delay	LOS	Warrant Met	Delay	LOS	Warrant Met
1	Brunswick Rd/Olympia Dr & Nevada City Hwy	Signal	D	35.6	D	-	39.1	D	-	36.2	D	-	39.2	D	-
2	Brunswick Rd & SR 20/49 SB/WB Off Ramp/Maltman Dr	Signal	D	33.1	C	-	36.3	D	-	33.2	C	-	37.7	D	-
3	Brunswick Rd & SR 20/49 NB/EB Ramps	Signal	D	14.4	B	-	12.5	B	-	14.7	B	-	13.5	B	-
4	Brunswick Rd & Sutton Way	Signal	D	29.4	C	-	40.6	D	-	29.8	C	-	40.8	D	-
5	Dorsey Dr & Main St	Signal	D	18.2	B	-	22.5	C	-	18.7	B	-	27.0	C	-
6	Dorsey Dr & Catherine Lane	TWSC	D	16.6	C	-	19.7	C	-	19.5	B	-	22.9	C	-
7	Dorsey Dr & SR 20/49 SB/EB On-Ramp/ Joerschke Dr	Signal	D	8.3	A	-	11.5	B	-	16.1	B	-	27.7	C	-
8	Dorsey Dr & SR 20/49 NB/WB Ramps	Signal	D	16.5	B	-	15.0	B	-	32.3	C	-	28.1	C	-
9	Dorsey Dr & Apartment Driveway	TWSC	D	10.6	B	-	11.8	B	-	13.4	B	-	18.1	B	-
10	Dorsey Dr & Sutton Way	AWSC	D	10.0	A	-	13.1	B	-	10.2	B	-	14.0	B	-
11	Idaho Maryland Rd & Sutton Way	AWSC	D	9.3	A	-	11.1	B	-	9.4	A	-	11.7	B	-
12	Idaho Maryland Rd & Brunswick Rd	TWSC	D	16.4	C	-	**122.1**	**F**	No	17.2	C	-	**184.1**	**F**	**Yes**
13	Idaho Maryland Rd & Spring Hill Dr	TWSC	D	11.8	B	-	15.2	C	-	13.0	B	-	27.9	D	-
14	Idaho Maryland Rd & Centennial Dr	TWSC	D	12.2	B	-	16.8	C	-	12.9	B	-	17.7	C	-
15	Idaho Maryland Rd/Main St & SR 20/49 SB/EB Ramps/Main St	RNDBT	D	7.8	A	-	9.9	A	-	8.7	A	-	11.9	B	-
16	Idaho Maryland Rd & SR 20/49 NB Ramps	AWSC	D	14.5	B	-	29.4	D	-	16.0	B	-	**38.9**	**E**	**Yes**
17	Bennett St & SR 20/49 SB Off-Ramp/Tinloy St	TWSC	D	14.5	B	-	17.8	C	-	17.0	C	-	23.8	C	-
18	Bennett St & SR 20/49 On-Ramp/Hansen Way	AWSC	D	14.9	B	-	14.0	B	-	15.4	C	-	14.6	B	-

Notes: AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout
Source: Appendix G

As shown in Table 8-8, all intersections would continue to operate at an acceptable LOS D or better, with the exception of Idaho Maryland Road and Brunswick Road in the PM peak hour and Idaho Maryland Road and SR 20/49 Northbound Ramps in the PM peak hour. At the intersection of Idaho Maryland Road and Brunswick Road, the intersection is projected to operate at LOS F without the project, but the project would increase delay at this location by 62 seconds. At this location, traffic on the eastbound approach is prohibited from traveling straight through the intersection to continue along Idaho Maryland Road and from making a left turn onto Brunswick Road, as shown on Figure 8-1. Signage prohibiting left-turns is posted and a concrete barrier is present to discourage these turning movements. However, many drivers continue to make illegal movements through this intersection, which is resulting in increased delays. To more effectively prevent these illegal movements, the City plans to replace the existing concrete "porkchop" barrier with a larger barrier. Mitigation Measure 8a requires the project applicant to ~~pay a fair share contribution towards~~ construct this improvement upon the issuance of the first building permit for the project. It is noted that construction of this improvement is also a requirement of the Loma Rica Ranch Phase 1 project, upon issuance of the building permit for the 50th dwelling unit in that project. The improvement would be constructed by whichever project first triggers the respective mitigation measure or condition of approval.

The Transportation Impact Analysis Report identified ~~two options~~ that signalization of the intersection ~~that would reduce the impact to the~~ at the Idaho Maryland Road and SR 20/49 Northbound Ramps intersection would reduce the delay such that the intersection would operate ~~to~~ at an acceptable LOS. Mitigation Measure 8b requires the project to pay a fair-share contribution for ~~construct~~ installation of ~~either~~ a traffic signal consistent with the Western Nevada County Regional Transportation Mitigation Fee ~~or a roundabout~~; the Transportation Impact Analysis Report notes that due to the proximity of the intersection to adjacent intersections, signal coordination would be required.

In addition to considering traffic flow through the intersections identified in Table 8-8, the Transportation Impact Analysis Report evaluates whether the project-generated traffic could result in vehicle queues that exceed available storage at the Dorsey Drive/SR 20/49 ramps. The analysis found that in the AM peak hour, queues in the northbound right-turn lane at the Dorsey Drive/SR 20/49 NB Ramp intersection would exceed available storage by 11 feet (less than one vehicle-length) and in the PM peak hour, queues in the eastbound right-turn lane at the Dorsey Drive/SR 20/49 SB Ramp/Joerschke Drive intersection would exceed available storage by 80 feet (less than four vehicles). The anticipated spillback would not result in adverse effects on adjacent intersection operations and there is adequate sight distance for vehicles to react to the expected queues. Thus the project-generated traffic under existing plus Alternative A conditions would not result in adverse effects on intersection operation and safety.

With implementation of Mitigation Measures 8a and 8b, all study area intersections would operate at acceptable LOS and Alternative A would have a **less-than-significant** impact.

Alternative B

Alternative B proposes approximately 104,350 square feet of commercial space, 8,500 square feet of office space, and 171 residential units. The development of Alternative B would bring employees, customers and residents to the project site, which would affect intersection operations. Table 8-9 presents the Transportation Impact Analysis Report forecasts for the study area intersections under existing plus Alternative B conditions, along with the roadway classification and resulting volume-to-capacity ratio and LOS. The peak hour conditions at each intersection under existing plus Alternative B conditions are shown in Figure 8-2. The LOS for two-way stop controlled intersections is based on the worst minor street approach. The LOS for intersections with other control types is based on the average of all approaches. The traffic signal warrant analysis is based on the peak hour signal warrant from the California Manual on Uniform Traffic Control Devices (MUTCD Warrant 3).

Table 8-9
Existing Plus Alternative B Intersection Level of Service

#	Intersection	Control Type	Target LOS	Existing						Existing Plus Alternative BA					
				AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met	Delay	LOS	Warrant Met	Delay	LOS	Warrant Met	Delay	LOS	Warrant Met
1	Brunswick Rd/Olympia Dr & Nevada City Hwy	Signal	D	35.6	D	-	39.1	D	-	36.2	D	-	39.6	D	-
2	Brunswick Rd & SR 20/49 SB/WB Off Ramp/Maltman Dr	Signal	D	33.1	C	-	3.6	D	-	33.3	C	-	36.8	D	-
3	Brunswick Rd & SR 20/49 NB/EB Ramps	Signal	D	14.1	B	-	12.5	B	-	14.7	B	-	13.1	B	-
4	Brunswick Rd & Sutton Way	Signal	D	29.4	C	-	40.6	D	-	29.7	C	-	40.8	D	-
5	Dorsey Dr & Main St	Signal	D	18.2	B	-	22.5	C	-	18.4	B	-	23.7	C	-
6	Dorsey Dr & Catherine Lane	TWSC	D	16.6	C	-	19.7	C	-	19.1	C	-	21.3	C	-
7	Dorsey Dr & SR 20/49 SB/EB On-Ramp/ Joerschke Dr	Signal	D	8.3	A	-	11.5	B	-	14.9	B	-	21.2	C	-
8	Dorsey Dr & SR 20/49 NB/WB Ramps	Signal	D	16.5	B	-	15.0	B	-	30.8	C	-	25.4	C	-
9	Dorsey Dr & Apartment Driveway	TWSC	D	10.6	B	-	11.8	B	-	11.5	B	-	15.8	B	-
10	Dorsey Dr & Sutton Way	AWSC	D	10.0	A	-	13.1	B	-	10.2	B	-	13.6	B	-
11	Idaho Maryland Rd & Sutton Way	AWSC	D	9.3	A	-	11.1	B	-	9.4	A	-	11.4	B	-
12	**Idaho Maryland Rd & Brunswick Rd**	**TWSC**	**D**	**16.4**	**C**	**-**	**122.1**	**F**	**NO**	**16.9**	**C**	-	**157.6**	**F**	Yes
13	Idaho Maryland Rd & Spring Hill Dr	TWSC	D	11.8	B	-	15.2	C	-	13.0	B	-	19.7	C	-
14	Idaho Maryland Rd & Centennial Dr	TWSC	D	12.2	B	-	16.8	C	-	12.4	B	-	17.4	C	-
15	Idaho Maryland Rd/Main St & SR 20/49 SB/EB Ramps/Main St	RNDBT	D	7.8	A	-	9.9	A	-	7.9	A	-	10.1	B	-
16	Idaho Maryland Rd & SR 20/49 NB Ramps	AWSC	D	14.5	B	-	29.4	D	-	15.9	C	-	35.0	D	-

Table 8-9
Existing Plus Alternative B Intersection Level of Service

#	Intersection	Control Type	Target LOS	Existing						Existing Plus Alternative BA					
				AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
				Delay	*LOS*	*Warrant Met*	*Delay*	*LOS*	*Warrant Met*	*Delay*	*LOS*	*Warrant Met*	*Delay*	*LOS*	*Warrant Met*
17	Bennett St & SR 20/49 SB Off-Ramp/Tinloy St	TWSC	D	14.5	B	-	17.8	C	-	14.6	B	-	18.2	C	-
18	Bennett St & SR 20/49 On-Ramp/Hansen Way	AWSC	D	14.9	B	-	14.0	B	-	15.3	C	-	14.4	B	-

Notes: AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout
Source: Appendix G

As shown in Table 8-9, all intersections would continue to operate at an acceptable LOS D or better, with the exception of Idaho Maryland Road and Brunswick Road in the PM peak hour. As discussed in the previous Alternative A section, the delays at this intersection are caused by drivers making illegal moves through the intersection. The City plans to modify the intersection by replacing the existing concrete barrier with a larger one to more effectively prohibit eastbound drivers from continuing straight through the intersection or making a left turn. Mitigation Measure 8a requires the project applicant ~~to contribute a fair-share payment towards the~~ construct~~ion of~~ the improved barrier at the Idaho Maryland Road and Brunswick Road Intersection.

In addition to considering traffic flow through the intersections identified in Table 8-9, the Transportation Impact Analysis Report evaluates whether the project-generated traffic could result in vehicle queues that exceed available storage at the Dorsey Drive/SR 20/49 ramps. The analysis found that in the PM peak hour, queues on the eastbound approach to the Dorsey Drive/SR 20/49 SB Ramp/Joerschke Drive would exceed the available storage by 35 feet, which is less than two vehicles. Further, the queues would dissipate every cycle. Therefore, this amount of spillback would not adversely affect intersection operations. The analysis also found that in the PM peak hour, queues in the eastbound left-turn lane and eastbound through lane at the Dorsey Drive/SR 20/49 NB Ramp intersection would exceed available storage by 22 feet (one vehicle) in the left-turn lane and by 51 feet (two vehicles) in the through lane. Field observations and simulation analysis projects that the queues would dissipate every cycle and there is adequate sight distance for vehicles to react to the expected queues. Thus the project-generated traffic under existing plus Alternative B conditions would not result in adverse effects on intersection operation and safety.

Implementation of Mitigation Measure 8a would ensure that the Idaho Maryland Road and Brunswick Road intersection operates at an acceptable LOS and would reduce the impact of Alternative B to a **less-than-significant** level.

Impact 8-3: Would the project increase impacts to vehicle safety due to roadway design features or incompatible uses

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

Alternative A would develop commercial and residential land uses while Alternative B would develop commercial, office, and residential land uses. The vehicle traffic associated with operation of the project under either alternative would include passenger vehicles and delivery trucks. Neither alternative would involve the use of vehicles that are not currently present on the local

roadway network. The proposed streets within the project site would meet all applicable City standards to ensure safe driving conditions are provided.

The project would extend Spring Hill Drive through the project site, creating a connection between Dorsey Drive and Idaho Maryland Road. A portion of the project-generated traffic and as well as some pass-through traffic would be expected to travel through the Spring Hill Drive/Idaho Maryland Road intersection. As shown in Table 8-7 and Table 8-8, the LOS at this intersection is expected to remain at acceptable levels under existing plus project conditions for either Alternative A or Alternative B. There are no substantial vertical or horizontal curves on Idaho Maryland Road that obstruct line of sight for drivers on either road. Therefore, the project would result in **less than significant** impacts related to roadway and vehicle safety.

Impact 8-4: Would the project result in inadequate emergency access or access to nearby uses?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

Both Alternative A and Alternative B would construct an internal circulation system throughout the project site; this internal circulation would include two emergency evacuation routes from the project site: one onto Idaho-Maryland Road via Spring Hill Drive and the other onto Dorsey Drive. Internal circulation and emergency evacuation roads would comply with all federal, state, and local regulations pertaining to emergency vehicle access. The project would have a **less-than-significant** impact on emergency access.

Impact 8-5: Would the project create hazards or barriers for pedestrians or bicyclists?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

With the development of either alternative, pedestrian traffic is expected to increase slightly due to the presence of commercial and retail land uses near adjacent residential areas. Both alternatives would maintain the existing pedestrian facilities along the project frontage. On-site pedestrian facilities included in both alternatives include continuous sidewalks, crosswalks, accessible paths of travel, extension of existing Dorsey Drive sidewalks, and extension of existing Spring Hill Drive

sidewalks. Additionally, both alternatives would implement the City's development standards to satisfy on-site bicyclist needs. The on-site facilities would connect to existing off-site Class II bike facilities on Dorsey Drive. Also, all off-site roadway improvements on Spring Hill Drive and Dorsey Drive would be designed to include bicycle traffic and be consistent with adopted transportation plans of the City of Grass Valley and Nevada County. Therefore, both Alternative A and Alternative B would have a **less-than-significant** impact on pedestrian and bicycle safety.

Impact 8-6: Would the project conflict with adopted policies, plans, or programs supporting alternative transportation or otherwise decrease the performance or safety of such facilities?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

Both alternatives would generate a moderate increase in transit ridership demand; this increase is expected to be satisfied by the existing transit services. Riders would utilize existing Brunswick Basin Route transit stops on either side of Dorsey Drive. Both Alternative A and Alternative B would have a **less-than-significant** impact on alternative transportation.

Impact 8-7: Would the project cause a change in air traffic patterns, including either an increase in traffic levels or a change in location resulting in substantial safety?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

The only public airport near the project site is the Nevada County Airport, which is located 1.45 miles from project site. The project site is within the 1.5-mile influence of the NCALUC. The site falls under Zone D, Traffic Pattern Zone and Urban Overlay Zone, which may require NCALUC review for proposals for new development (including buildings, antennas, and other structures) having a height of more than 100 feet within Compatibility Zone D (Mead & Hunt 2011). Land use development that may create attractions for birds is also prohibited.

The maximum proposed height of buildings under Alternative A and Alternative B is 40 feet; neither alternative would include any features that would attract birds, such as ponds, pools, or wetlands. As discussed in Chapter 15, Hazards and Hazardous Materials, the land uses under both

Alternative A and B would be consistent with the allowable uses, building heights, and population intensities for Compatibility Zone D. The completion of the Master Plan Update would not affect air traffic levels or patterns; therefore both Alternative A and Alternative B would have a less than significant impact.

Impact 8-8: Would the project result in increased vehicle circulation or congestion due to a lack of sufficient parking capacity to support the proposed land uses?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	No impact	No impact
Mitigation measures:	None required	None required
Significance after mitigation:	No impact	No impact

Alternative A

Alternative A would provide on-site parking for all of the proposed land uses consistent with the City's parking standards. City standards for the commercial component require 716 stalls, 18 of which would be accessible parking stalls. Alternative A proposes 746 stalls, of which 632 are standard, 81 are compact, 26 of accessible, 8 are motorcycle, and 74 are reserved for low emitting vehicles. Alternative A provides 180 parking stalls for the residential component, of which 1 is compact, 4 are motorcycle, and 7 are accessible parking. The project would provide sufficient parking for the anticipated uses and would have **no impact** related to insufficient parking capacity.

Alternative B

Alternative B would provide on-site parking for all of the proposed land uses consistent with the City's parking standards. City standards for the commercial component require 417 stalls, 12 of which would be accessible parking stalls. Alternative A proposes 624 stalls, of which 447 are standard, 77 are compact, 14 of accessible, 5 are motorcycle, 46 are low emitting and 35 are future electric vehicle charging. Alternative B provides 407 parking stalls for the residential component, of which 7 are motorcycle, 10 are accessible parking and 12 are future electric vehicle charging. Additionally, Alternative B provides 29 stalls (one of which is accessible) for the office component. The project would provide sufficient parking for the anticipated uses and would have **no impact** related to insufficient parking capacity.

Impact 8-9: Would the project contribute to a cumulative increase in traffic that conflicts with adopted policies and plans related to intersection and roadway segment function, including consideration of LOS and ADT?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Significant	Significant
Mitigation measures:	Mitigation Measures 8a through 8g	Mitigation Measures 8a, 8b, 8e, and 8h
Significance after mitigation:	Significant and unavoidable	Less than significant

Alternative A

The peak hour conditions at each intersection under cumulative no project conditions are shown in Figure 8-3. Table 8-10 presents the Transportation Impact Analysis Report forecasts for the 18 study area intersections under Year 2035 conditions and Year 2035 plus Alternative A conditions, along with the roadway classification and resulting volume-to-capacity ratio and LOS. The LOS for two-way stop controlled intersections is based on the worst minor street approach. The LOS for intersections with other control types is based on the average of all approaches. The traffic signal warrant analysis is based on the peak hour signal warrant from the MUTCD Warrant 3.

Table 8-10
Year 2035 Plus Alternative A Intersection Level of Service

#	Intersection	Control Type	Target LOS	2035 No Project						2035 Plus Alternative A					
				AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met	Delay	LOS	Warrant Met	Delay	LOS	Warrant Met	Delay	LOS	Warrant Met
1	Brunswick Rd/Olympia Dr & Nevada City Hwy	Signal	D	36.1	D	-	39.5	D	-	36.9	D	-	39.1	D	-
2	Brunswick Rd & SR 20/49 SB/WB Off Ramp/Maltman Dr	Signal	D	34.2	C	-	36.8	D	-	35.2	D	-	38.7	D	-
3	Brunswick Rd & SR 20/49 NB/EB Ramps	Signal	D	15.4	B	-	13.1	B	-	15.9	B	-	14.0	B	-
4	Brunswick Rd & Sutton Way	Signal	D	31.4	C	-	45.4	D	-	31.5	C	-	46.0	D	-
5	Dorsey Dr & Main St	Signal	D	19.7	B	-	28.2	C	-	21.3	C	-	33.1	C	-
6	Dorsey Dr & Catherine Lane	TWSC	D	18.8	C	-	29.4	D	-	23.0	C	-	**35.9**	**E**	**Yes**
7	Dorsey Dr & SR 20/49 SB/EB On-Ramp/ Joerschke Dr	Signal	D	12.5	B	-	19.8	B	-	19.3	B	-	**105.2**	**F**	-
8	Dorsey Dr & SR 20/49 NB/WB Ramps	Signal	D	17.3	B	-	17.6	B	-	34.4	C	-	35.6	D	-
9	Dorsey Dr & Apartment Driveway	TWSC	D	13.1	B	-	23.2	C	-	13.4	B	-	23.0	C	-
10	Dorsey Dr & Sutton Way	AWSC	D	**45.1**	**E**	No	**291.3**	**F**	**Yes**	**59.0**	**F**	No	**OVR**	**F**	**Yes**
11	Idaho Maryland Rd & Sutton Way	AWSC	D	10.2	B	-	13.0	B	-	10.6	B	-	14.2	B	-
12	Idaho Maryland Rd & Brunswick Rd	TWSC	D	**209.8**	**F**	**Yes**	**OVR**	**F**	**Yes**	**OVR**	**F**	**Yes**	**OVR**	**F**	**Yes**
13	Idaho Maryland Rd & Spring Hill Dr	TWSC	D	13.5	B	-	18.4	C	-	15.3	C	-	**39.0**	**E**	**Yes**
14	Idaho Maryland Rd & Centennial Dr	TWSC	D	13.6	B	-	29.4	D	-	13.7	B	-	33.6	D	-
15	Idaho Maryland Rd/Main St & SR 20/49 SB/EB Ramps/Main St	RNDBT	D	9.1	A	-	13.6	B	-	12.2	B	-	17.8	B	-
16	Idaho Maryland Rd & SR 20/49 NB Ramps	AWSC	D	22.6	C	-	**49.3**	**E**	**Yes**	27.2	D	-	**65.0**	**F**	**Yes**
17	Bennett St & SR 20/49 SB Off-Ramp/Tinloy St	TWSC	D	15.1	C	-	26.2	D	-	17.9	C	-	**45.6**	**E**	**Yes**
18	Bennett St & SR 20/49 On-Ramp/Hansen Way	AWSC	D	23.6	C	-	18.1	C	-	25.1	D	-	19.6	C	-

Notes: AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout
Source: Appendix G

As shown in Table 8-10, Alternative A would contribute to unacceptable LOS at several intersections. Alternative A would cause the following impacts and require implementation of the identified mitigation measures:

In the PM peak hour under the 2035 no project condition the Dorsey Drive/Catherine Lane intersection would operate at LOS D. With the addition of Alternative A, this would decrease to LOS E and the intersection would meet the peak hour volume signal warrant. Mitigation Measure 8c would require the project applicant to ~~contribute a fair share payment towards the construction~~ install ~~of~~ a traffic signal at the Dorsey Drive/Catherine Lane intersection. Installation of a traffic signal would restore the intersection to LOS D conditions.

In the PM peak hour under the 2035 no project condition the Dorsey Drive/SR 20/49 SB/EB Ramp/Joerschke Drive intersection would operate at LOS B. With the addition of Alternative A, this would decrease to LOS F. Mitigation Measure 8d would require the project applicant to contribute ~~a fair share payment~~ funding sufficient to allow Caltrans staff to ~~towards modification~~ modify ~~of~~ the signal timing to restore the intersection operations to LOS D or better. This would improve the LOS at this intersection but would not alter the volume of traffic passing through other intersections within the study area and thus would not adversely affect the LOS at other study locations.

In the 2035 no project condition the Dorsey Drive/Sutton Way intersection would operate at LOS E in the AM peak hour and LOS F in the PM peak hour. The addition of traffic generated by Alternative A would increase delay in the AM peak hour by 14 seconds and decrease the LOS to F, and would increase delay in the PM peak hour. The intersection would meet the peak hour signal warrant in the PM peak hour under both no project and plus project conditions. Mitigation Measure 8e would require the project applicant to contribute a fair share payment towards the City's planned improvements at this intersection. It was initially anticipated that the intersection would be signalized or converted to a roundabout; however with the recent approval of the Loma Rica Ranch Phase 1 project, current plans are to realign Dorsey Drive and Sutton Way to create two three-legged intersections along Sutton Way. ~~construction of a traffic signal or conversion of the intersection to a roundabout to provide for~~ Signalization or creation of the two three-legged intersections ~~improvement of~~ would allow the ~~the operations at this location~~ intersection to operate at ~~to~~ LOS D or better.

In the 2035 no project condition the Idaho Maryland Road/Brunswick Road intersection would operate at LOS F and would meet the peak hour signal warrant in both the AM and PM peak hours. The addition of traffic generated by Alternative A would increase delay in each peak hour by 10 seconds or more. As discussed previously, drivers making illegal moves through the intersection contribute to the delays at this location. The City plans to modify the intersection by replacing the existing concrete barrier with a larger one to more effectively prohibit eastbound drivers from continuing straight through the intersection or making a left turn. Mitigation Measure 8a requires

the project applicant to ~~contribute a fair-share payment towards the~~ construct~~ion of~~ the improved barrier at the Idaho Maryland Road and Brunswick Road Intersection and to contribute a fair-share payment towards signalization of this intersection, as included in the City of Grass Valley Traffic Impact Fee and CIP. Implementation of Mitigation Measure 8a would ensure that the Idaho Maryland Road and Brunswick Road intersection operates at an acceptable LOS under the cumulative plus project condition.

In the 2035 plus Alternative A condition, operations at the Idaho Maryland Road/Spring Hill Drive intersection would decrease to LOS E in the PM peak hour, compared to the LOS C operations in the 2035 no project condition. Mitigation Measure 8f would require modifying the lane striping on the southbound approach to the intersection to create a right turn pocket. The existing road width of approximately 38 feet is sufficient to accommodate this turn pocket with no additional right-of-way or paving. Although the impact would occur in the year 2035 conditions, Mitigation Measure 8f requires the restriping to be completed prior to issuance of certificates of occupancy for any of the buildings constructed onsite. This would not adversely affect traffic operations in the existing plus project conditions.

The Idaho Maryland Road/SR 20/49 NB Ramps intersection would operate at LOS E in the PM peak hour under 2035 no project conditions. The addition of traffic generated by Alternative A would decrease operations at this location to LOS F and increase delay by 15.7 seconds. Mitigation Measure 8b requires the project applicant to contribute a fair-share amount towards ~~either~~ installation of a traffic signal ~~or construction of a roundabout~~ at this location. ~~Either~~ This improvement would restore the intersection operations to an acceptable LOS.

The Bennett Street/SR 20/49 SB Off-Ramp/Tinloy Street intersection would operate at LOS D in the PM peak hour under 2035 no project condition and LOS F in the 2035 plus project condition. Further, the addition of traffic generated by Alternative A would cause the intersection to meet the peak hour signal warrant in the PM peak hour. Mitigation Measure 8g requires the project applicant to contribute a fair-share payment towards ~~the construction~~ installation of a traffic signal ~~or roundabout~~ at the Bennett Street/SR 20/49 SB Off-Ramp/Tinloy Street intersection as identified in the City's Capital Improvement Program through payment of the City of Grass Valley Traffic Impact Fee. ~~Either~~ This improvement would restore the intersection operations to an acceptable LOS.

In addition to considering traffic flow through the intersections identified in Table 8-10, the Transportation Impact Analysis Report evaluates whether the project-generated traffic could result in vehicle queues that exceed available storage at the Dorsey Drive/SR 20/49 ramps. The analysis found that the following conditions would occur:

The queue in the eastbound right-turn lane, southbound left/through lane, and southbound right-turn lane at the Dorsey Drive/SR 20/49 SB Ramp/Joerschke Drive intersection would exceed available storage in the PM peak hour. The eastbound right-turn lane queue would exceed available storage by 101 feet (four vehicles), the southbound left/through lane queue would exceed available storage by 535 feet (21 vehicles), and the southbound right-turn lane queue would exceed available storage by 373 feet (15 vehicles). These queues could extent into the mainline of SR 20/49, and thus the project could result in a significant impact to freeway operations and safety. Improving these conditions would require reconstruction of the Dorsey Drive interchange to add additional lanes on the overcrossing and off-ramp approaches or a multi-lane roundabout interchange. These improvements would involve substantial physical construction and costs and were determined to be infeasible for the project to implement.

At the Dorsey Drive/SR 20/49 NB Ramps, the queue in the eastbound through lane would exceed available storage by 37 feet (less than two vehicles) in the AM peak hour and by 9 feet (less than one vehicle) in the PM peak hour. The queue in the northbound right-turn lane would exceed available storage by 15 feet (less than one vehicle) in the PM peak hour. The spillback in these lanes would not adversely affect intersection operations and sufficient sight distance would be available to allow vehicles to react to these queues.

With implementation of Mitigation Measures 8a through 8g, intersection operations in the cumulative plus Alternative A conditions would remain at acceptable LOS however the vehicle queues at the Dorsey Drive interchange would result in adverse effects to traffic flow and safety. Thus Alternative A would result in a **significant and unavoidable** impact due to its cumulatively considerable contribution to cumulative impacts at this location.

SR 20/49 Traffic Volumes

Table 8-11 identifies the peak hour traffic volumes and operations on the SR 20/49 ramp merge, diverge, and freeway mainline segments under the year 2035 no project and 2035 plus Alternative A conditions.

Table 8-11
Cumulative Plus Alternative A SR 20/49 Conditions

#	Location	Facility	2035 No Project						2035 Plus Alternative A					
			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
			Volume	*Density*	*LOS*	*Volume*	*Density*	*LOS*	*Volume*	*Density*	*LOS*	*Volume*	*Density*	*LOS*
1	North of Brunswick NB	2-lane Freeway	1,083	10.1	A	1,924	18.0	B	1,083	10.1	A	1,924	18.0	B
2	Brunswick On-Ramp NB	1-lane Merge	260	12.7	B	510	20.3	C	260	12.7	B	510	20.3	C
3	Brunswick Loop On-Ramp NB	1-lane Merge	100	10.2	B	170	15.6	B	100	10.2	B	170	15.6	B
4	Dorsey to Brunswick NB	1-lane Weave	-	11.0	B	-	15.1	B	-	11.2	B	-	15.6	B
5	Idaho Maryland to Dorsey NB	1-lane Weave	-	16.9	B	-	17.0	B	-	17.6	B	-	17.4	B
6	Bennett to Idaho Maryland NB	1-lane Weave	-	21.8	C		20.1	C	-	22.4	C	-	20.4	C
7	South of Bennett NB	2-lane Freeway	1,868	18.5	C	1,754	17.3	B	1,922	19.0	C	1,772	17.5	B
8	North of Brunswick SB	2-lane Freeway	1,775	17.5	B	1,356	13.4	B	1,775	17.5	B	1,356	13.4	B
9	Brunswick Off-Ramp SB	1-lane Diverge	465	15.6	B	545	11.3	B	465	15.6	B	545	11.3	B
10	Brunswick Loop On-Ramp SB	1-lane Merge	245	16.8	B	430	13.7	B	259	17.0	B	449	13.8	B
11	Brunswick to Dorsey SB	1-lane Weave	-	11.1	B	-	10.9	B	-	11.1	B	-	10.9	B
12	Dorsey to Idaho Maryland SB	1-lane Weave	-	13.3	B	-	17.5	B	-	14.3	B	-	18.3	B
13	Idaho Maryland to Bennett SB	1-lane Weave	-	16.5	B	-	22.0	C	-	17.3	B	-	22.6	C
14	South of Bennett SB	2-lane Freeway	1,500	14.8	B	1,999	19.7	C	1,591	15.7	B	2,067	20.4	C

Source: Appendix G

As shown in Table 8-11, all segments of SR 20/49 would continue to operate at an acceptable LOS under Year 2035 plus Alternative A conditions. Therefore, the impact of Alternative A in the cumulative scenario would be **less than significant**.

Alternative B

Alternative B proposes development of approximately 104,350 square feet of commercial uses, 8,500 square feet of office space, and 171 multi-family apartments. Development of Alternative B and the associated increase in on-site employees, customers and residents would affect traffic segment operations.

Table 8-12 presents the Transportation Impact Analysis Report forecasts for intersection operations under year 2035 plus Alternative B conditions, along with the roadway classification and resulting volume-to-capacity ratio and LOS. The LOS for two-way stop controlled intersections is based on the worst minor street approach. The LOS for intersections with other control types is based on the average of all approaches. The traffic signal warrant analysis is based on the peak hour signal warrant from the MUTCD Warrant 3. Figure 8-4 shows the peak hour intersection conditions under this cumulative plus Alternative B scenario.

Table 8-12
Year 2035 Plus Alternative B Intersection Level of Service

#	Intersection	Control Type	Target LOS	2035 No Project						2035 Plus Alternative B					
				AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met	Delay	LOS	Warrant Met	Delay	LOS	Warrant Met	Delay	LOS	Warrant Met
1	Brunswick Rd/Olympia Dr & Nevada City Hwy	Signal	D	36.1	D	-	39.5	D	-	36.9	D	-	39.9	D	-
2	Brunswick Rd & SR 20/49 SB/WB Off Ramp/Maltman Dr	Signal	D	34.2	C	-	36.8	D	-	35.2	D	-	38.7	D	-
3	Brunswick Rd & SR 20/49 NB/EB Ramps	Signal	D	15.4	B	-	13.1	B	-	15.8	B	-	13.7	B	-
4	Brunswick Rd & Sutton Way	Signal	D	31.4	C	-	45.4	D	-	31.5	C	-	46.0	D	-
5	Dorsey Dr & Main St	Signal	D	19.7	B	-	28.2	C	-	20.0	B	-	29.7	C	-
6	Dorsey Dr & Catherine Lane	TWSC	D	18.8	C	-	29.4	D	-	22.5	C	-	33.8	D	-
7	Dorsey Dr & SR 20/49 SB/EB On-Ramp/ Joerschke Dr	Signal	D	12.5	B	-	19.8	B	-	18.2	B	-	40.0	D	-
8	Dorsey Dr & SR 20/49 NB/WB Ramps	Signal	D	17.3	B	-	17.6	B	-	33.2	C	-	41.4	D	-
9	Dorsey Dr & Apartment Driveway	TWSC	D	13.1	B	-	23.2	C	-	12.6	B	-	18.4	B	-
10	Dorsey Dr & Sutton Way	AWSC	D	**45.1**	**E**	No	**291.3**	**F**	**Yes**	**55.7**	**F**	No	**OVR**	**F**	**Yes**
11	Idaho Maryland Rd & Sutton Way	AWSC	D	10.2	B	-	13.0	B	-	10.5	B	-	13.7	B	-
12	Idaho Maryland Rd & Brunswick Rd	TWSC	D	**209.8**	**F**	**Yes**	**OVR**	**F**	**Yes**	**259.7**	**F**	**Yes**	**OVR**	**F**	**Yes**
13	Idaho Maryland Rd & Spring Hill Dr	TWSC	D	13.5	B	-	18.4	C	-	15.7	C	-	24.3	C	-
14	Idaho Maryland Rd & Centennial Dr	TWSC	D	13.6	B	-	29.4	D	-	13.9	B	-	32.6	D	-
15	Idaho Maryland Rd/Main St & SR 20/49 SB/EB Ramps/Main St	RNDBT	D	9.1	A	-	13.6	B	-	9.2	A	-	14.1	B	-
16	Idaho Maryland Rd & SR 20/49 NB Ramps	AWSC	D	22.6	C	-	**49.3**	**E**	**Yes**	25.4	D	-	**58.6**	**F**	**Yes**
17	Bennett St & SR 20/49 SB Off-Ramp/Tinloy St	TWSC	D	15.1	C	-	26.2	D	-	15.3	C	-	27.5	D	-
18	Bennett St & SR 20/49 On-Ramp/Hansen Way	AWSC	D	23.6	C	-	18.1	C	-	24.7	C	-	19.1	C	-

Notes: AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout
Source: Appendix G

As shown in Table 8-12 and discussed in the following paragraphs, Alternative B would contribute to unacceptable LOS at the Dorsey Drive/Sutton Way and Idaho Maryland Road/Brunswick Road intersections in the AM peak hour and the Dorsey Drive/Sutton Way, Idaho Maryland Road/Brunswick Road, and Idaho Maryland Road/SR 20/49 NB Ramps intersections in the PM peak hour.

In the 2035 no project condition the Dorsey Drive/Sutton Way intersection would operate at LOS E in the AM peak hour and LOS F in the PM peak hour. The addition of traffic generated by Alternative B would increase delay in the AM peak hour by 10.6 seconds and decrease the LOS to F but volumes in the AM peak hour would not satisfy the peak hour signal warrant. In the PM peak hour, the addition of traffic generated by Alternative B would increase delay. The intersection would meet the peak hour signal warrant in the PM peak hour under both no project and plus project conditions. Mitigation Measure 8e would require the project applicant to contribute a fair share payment towards the City's planned improvements at this intersection. It was initially anticipated that the intersection would be signalized or converted to a roundabout; however with the recent approval of the Loma Rica Ranch Phase 1 project, current plans are to realign Dorsey Drive and Sutton Way to create two three-legged intersections along Sutton Way. Signalization or creation of the two three-legged intersections would allow the intersection to operate at ~~the construction of a traffic signal or conversion of the intersection to a roundabout to provide for improvement of the operations at this location to~~ LOS D or better. Under the signalization option, the intersection would operate at LOS B, with a delay of 17.2 seconds, in the AM peak hour and LOS C, with a delay of 23.1 seconds, in the PM peak hour (Appendix G).

In the 2035 no project condition the Idaho Maryland Road/Brunswick Road intersection would operate at LOS F and would meet the peak hour signal warrant in both the AM and PM peak hours. The addition of traffic generated by Alternative B would increase delay in each peak hour by 10 seconds or more. As discussed previously, drivers making illegal moves through the intersection contribute to the delays at this location. The City plans to modify the intersection by replacing the existing concrete barrier with a larger one to more effectively prohibit eastbound drivers from continuing straight through the intersection or making a left turn. Mitigation Measure 8a requires the project applicant to ~~contribute a fair-share payment towards the~~ construct~~ion of~~ the improved barrier at the Idaho Maryland Road and Brunswick Road Intersection to mitigate near-term conditions and to contribute a fair-share payment towards signalization of this intersection, consistent with the City of Grass Valley Traffic Impact Fee and CIP to mitigate cumulative conditions. Implementation of Mitigation Measure 8a would ensure that the Idaho Maryland Road and Brunswick Road intersection operates at an acceptable LOS under the cumulative plus project condition, with LOS C conditions (25.6 seconds of delay) in the AM peak hour and LOS D conditions (43.7 seconds of delay) in the PM peak hour (Appendix G).

The Idaho Maryland Road/SR 20/49 NB Ramps intersection would operate at LOS E in the PM peak hour under 2035 no project conditions. The addition of traffic generated by Alternative B would decrease operations at this location to LOS F and increase delay by 9.3 seconds. Mitigation Measure 8b requires the project applicant to contribute a fair-share amount towards ~~either~~ installation of a traffic signal ~~or construction of a roundabout~~ at this location. ~~Either~~ This improvement would restore the intersection operations to an acceptable LOS of LOS C (34.2 seconds of delay) in the PM peak hour (the intersection would operate acceptably with and without the improvement in the AM peak hour) (Appendix G).

In addition to considering traffic flow through the intersections identified in Table 8-12, the Transportation Impact Analysis Report evaluates whether the project-generated traffic could result in vehicle queues that exceed available storage at the Dorsey Drive/SR 20/49 ramps. The analysis found that the following conditions would occur:

The queues on each approach to the Dorsey Drive/SR 20/49 SB Ramp/Joerschke Drive and the Dorsey Drive/SR 20/49 NB Ramps intersections would exceed available storage in the PM peak hour. The queues at the Dorsey Drive/SR 20/49 SB Ramp/Joerschke Drive intersection would exceed available storage by between 111 feet and 1,143 feet. The queues at the Dorsey Drive/SR 20/49 NB Ramps intersection would exceed available storage by between 63 feet and 622 feet. Mitigation Measure 8h requires the project applicant to provide adequate funding to the City to modify the signal timing at these intersections to reduce vehicle queues. With implementation of Mitigation Measure 8h, the queues in the eastbound right-turn lane at the Dorsey Drive/SR 20/49 SB Ramp/Joerschke Drive intersection would exceed available storage by 86 feet (less than four vehicles) and the queues in the westbound left-turn lane would exceed available storage by 111 feet (less than five vehicles). As the Dorsey Drive/SR 20/49 NB Ramps intersection, queues in the eastbound left-turn lane would exceed available storage by 41 feet (less than two vehicles) and queues in the eastbound through lane would exceed available storage by 17 feet (less than one vehicle). The spillback associated with these queues would not adversely affect traffic operations and sufficient sight distance would be available to allow vehicles to react to these queues.

With implementation of Mitigation Measures 8a, 8b, 8e, and 8h intersection operations in the cumulative plus Alternative B conditions would remain at acceptable LOS and vehicle queues would not adversely affect intersection operations or safety. Thus, the contribution of Alternative B to significant cumulative intersection operation impacts would be reduced to a **less-than-significant** level.

SR 20/49 Traffic Volumes

Table 8-13 identifies the peak hour traffic volumes and operations on the SR 20/49 ramp merge, diverge, and freeway mainline segments under the year 2035 no project and 2035 plus Alternative B conditions.

Table 8-13
Cumulative Plus Alternative B SR 20/49 Conditions

#	Location	Facility	2035 No Project						2035 Plus Alternative B					
			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
			Volume	*Density*	*LOS*	*Volume*	*Density*	*LOS*	*Volume*	*Density*	*LOS*	*Volume*	*Density*	*LOS*
1	North of Brunswick NB	2-lane Freeway	1,083	10.1	A	1,924	18.0	B	1,083	10.1	A	1,924	18.0	B
2	Brunswick On-Ramp NB	1-lane Merge	260	12.7	B	510	20.3	C	260	12.7	B	510	20.3	C
3	Brunswick Loop On-Ramp NB	1-lane Merge	100	10.2	B	170	15.6	B	100	10.2	B	170	15.6	B
4	Dorsey to Brunswick NB	1-lane Weave	-	11.0	B	-	15.1	B	-	11.1	B	-	16.0	B
5	Idaho Maryland to Dorsey NB	1-lane Weave	-	16.9	B	-	17.0	B	-	17.6	B	-	18.0	B
6	Bennett to Idaho Maryland NB	1-lane Weave	-	21.8	C		20.1	C	-	22.3	C	-	21.0	C
7	South of Bennett NB	2-lane Freeway	1,868	18.5	C	1,754	17.3	B	1,901	18.8	C	1,794	17.7	B
8	North of Brunswick SB	2-lane Freeway	1,775	17.5	B	1,356	13.4	B	1,775	17.5	B	1,356	13.4	B
9	Brunswick Off-Ramp SB	1-lane Diverge	465	15.6	B	545	11.3	B	465	15.6	B	545	11.3	B
10	Brunswick Loop On-Ramp SB	1-lane Merge	245	16.8	B	430	13.7	B	245	16.8	B	449	13.9	B
11	Brunswick to Dorsey SB	1-lane Weave	-	11.1	B	-	10.9	B	-	10.9	B	-	11.0	B
12	Dorsey to Idaho Maryland SB	1-lane Weave	-	13.3	B	-	17.5	B	-	13.7	B	-	19.4	B
13	Idaho Maryland to Bennett SB	1-lane Weave	-	16.5	B	-	22.0	C	-	16.8	B	-	23.8	C
14	South of Bennett SB	2-lane Freeway	1,500	14.8	B	1,999	19.7	C	1,529	15.1	B	2,130	21.0	C

Source: Appendix G

As shown in Table 8-13, all SR 20/49 facilities would continue to operate at an acceptable LOS under Year 2035 plus Alternative B conditions. Therefore, the cumulative impact of the Alternative B would be **less than significant**.

8.4 MITIGATION MEASURES

Mitigation Measure 8a: Under either Alternative A or Alternative B, prior to issuance of a building permit, the project applicant shall ~~pay a fair-share contribution towards the~~ construction ~~of~~ a larger concrete porkchop barrier within the existing acceleration lane to restrict all movements from the eastbound approach at the Idaho Maryland Road/ Brunswick Road intersection to right turns. Additionally, under either Alternative A or Alternative B, prior to issuance of a building permit, the project applicant shall pay the City of Grass Valley Traffic Impact Fee, which includes a fair-share contribution towards signalization of this intersection consistent with the City's Capital Improvement Program.

Mitigation Measure 8b: Under Alternative A or Alternative B, prior to issuance of a building permit, the project applicant shall pay the Western Nevada County Regional Transportation Mitigation Fee, which includes a fair-share contribution towards the ~~construction~~ installation of ~~either~~ a traffic signal ~~or a roundabout~~ at the Idaho Maryland Road/State Route 20/49 northbound ramps intersection, consistent with the Western Nevada County Regional Transportation Mitigation Fee improvement program.

Mitigation Measure 8c: Under Alternative A, prior to issuance of the first certificate of occupancy for the project site~~a building permit~~, the project applicant shall ~~pay a fair-share contribution towards the construction~~ install ~~of~~ a traffic signal at the Dorsey Drive/Catherine Lane intersection.

Mitigation Measure 8d: Under Alternative A, prior to issuance of the first certificate of occupancy for the project site, the project applicant shall ~~pay a fair share contribution~~ fully fund agency staff time needed to complete ~~towards the~~ signal optimization of the Dorsey Drive/SR 20/49 SB/EB On-Ramp/Joerschke Drive traffic signal.

Mitigation Measure 8e: Under Alternative A or Alternative B, prior to issuance of a building permit, the project applicant shall pay the City of Grass Valley Traffic Impact Fee, which includes a fair share contribution towards

the City's planned improvements at the ~~construction of either a traffic signal or roundabout at the~~ Dorsey Drive/Sutton Way intersection, consistent with the City's Capital Improvement Program.

Mitigation Measure 8f: Under Alternative A, prior to issuance of a building permit, the project applicant shall restripe the southbound approach to the Idaho Maryland Road/Spring Hill Drive intersection to create a southbound right-turn pocket.

Mitigation Measure 8g: Under Alternative A, prior to issuance of a building permit, the project applicant shall pay the City of Grass Valley Traffic Impact Fee, which includes a fair share contribution towards the ~~construction~~ installation of a traffic signal ~~or roundabout~~ at the Bennett Street/SR 20/49 SB Off-Ramp/Tinloy Street intersection, consistent with the City's Capital Improvement Program.

Mitigation Measure 8h: Under Alternative B, prior to issuance of the first certificate of occupancy for the project site, the project applicant shall pay a fair share contribution towards the signal optimization of the traffic signals at the Dorsey Drive/SR 20/49 SB Ramp/Joerschke Drive intersection and the Dorsey Drive/SR 20/49 NB Ramps intersection.

8.5 REFERENCES CITED

California Department of Transportation (Caltrans). 2000. *Transportation Concept Report for State Route 49*. September 30, 2000.

Caltrans. 2002. *Guide for the Preparation of Traffic Impact Studies.* December 2002.

Caltrans. 2013. *Transportation Concept Report for State Route 20*. March 11, 2013.

City of Grass Valley. 1999. *City of Grass Valley 2020 General Plan*. Adopted November 1999.

Grass Valley, City of. 2016. *City of Grass Valley City Council Agenda Action Sheet for Council Meeting Date October 11, 2016.* October 2016.

ITE (Institute of Transportation Engineers). 2012. *Trip Generation Manual.* Ninth Edition.

ITE. 2014. *Trip Generation Handbook.* Third Edition.

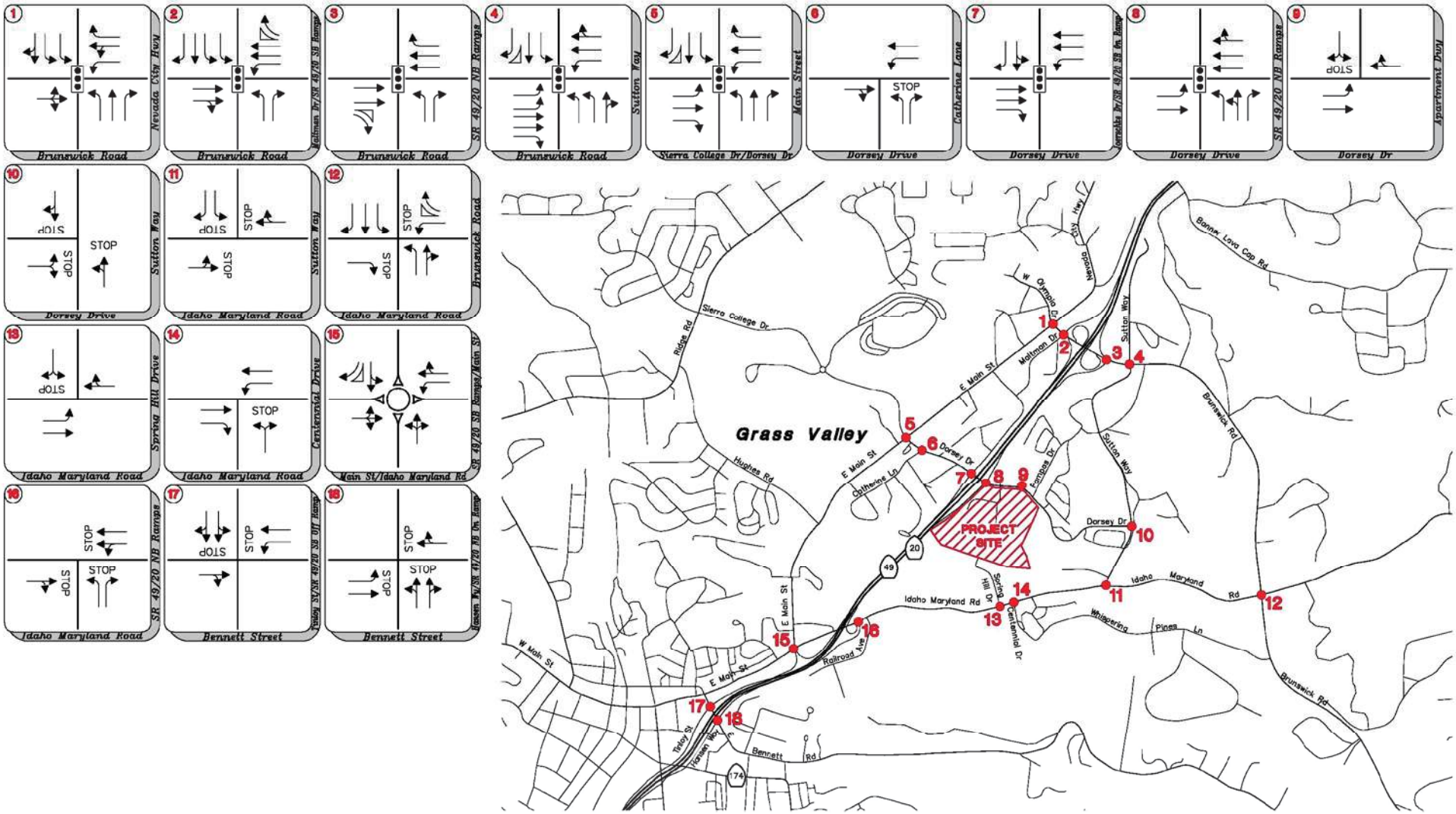
LSC Transportation Consultants Inc. 2016. *Western Nevada County Transit Development Plan Update*. Prepared for Nevada County Transportation Commission. April 11, 2016.

Nevada County Transportation Commission (NCTC). 2011. *Nevada County Pedestrian Improvement Plan*. Adopted March 16, 2011.

NCTC. *Nevada County Bicycle Master Plan Update*. Adopted July 17, 2013.

NCTC. 2016. Western Nevada County Regional Transportation Mitigation Fee 2016 Nexus Study Update. Prepared by Parsons Brinkerhoff on behalf of NCTC. August 2016.

Transportation Research Board (TRB). 2000. Highway Capacity Manual 2000.



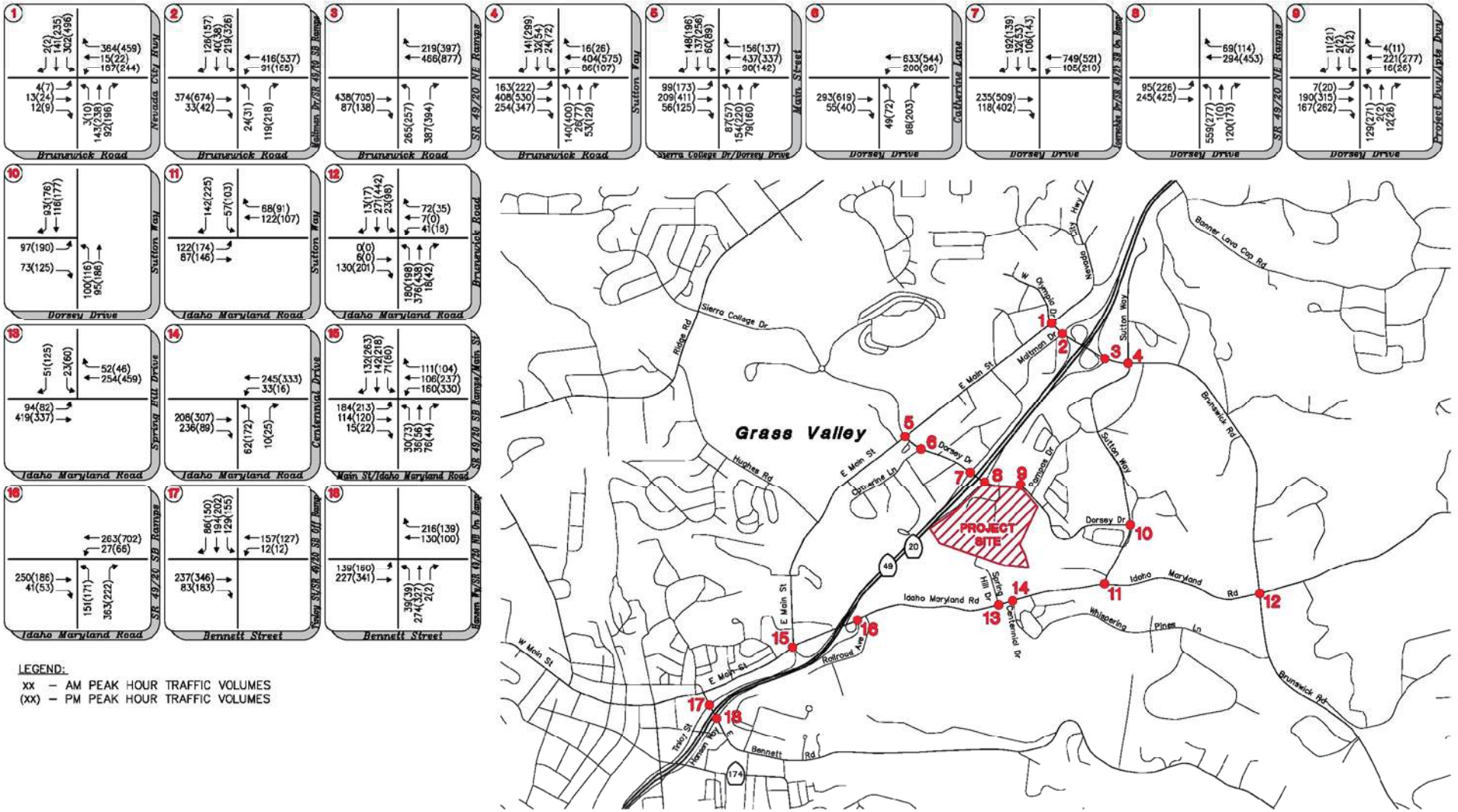
SOURCE: Omni Means 2018

FIGURE 8-1

Existing Peak Hour Traffic Volumes

Dorsey Marketplace EIR

DUDEK



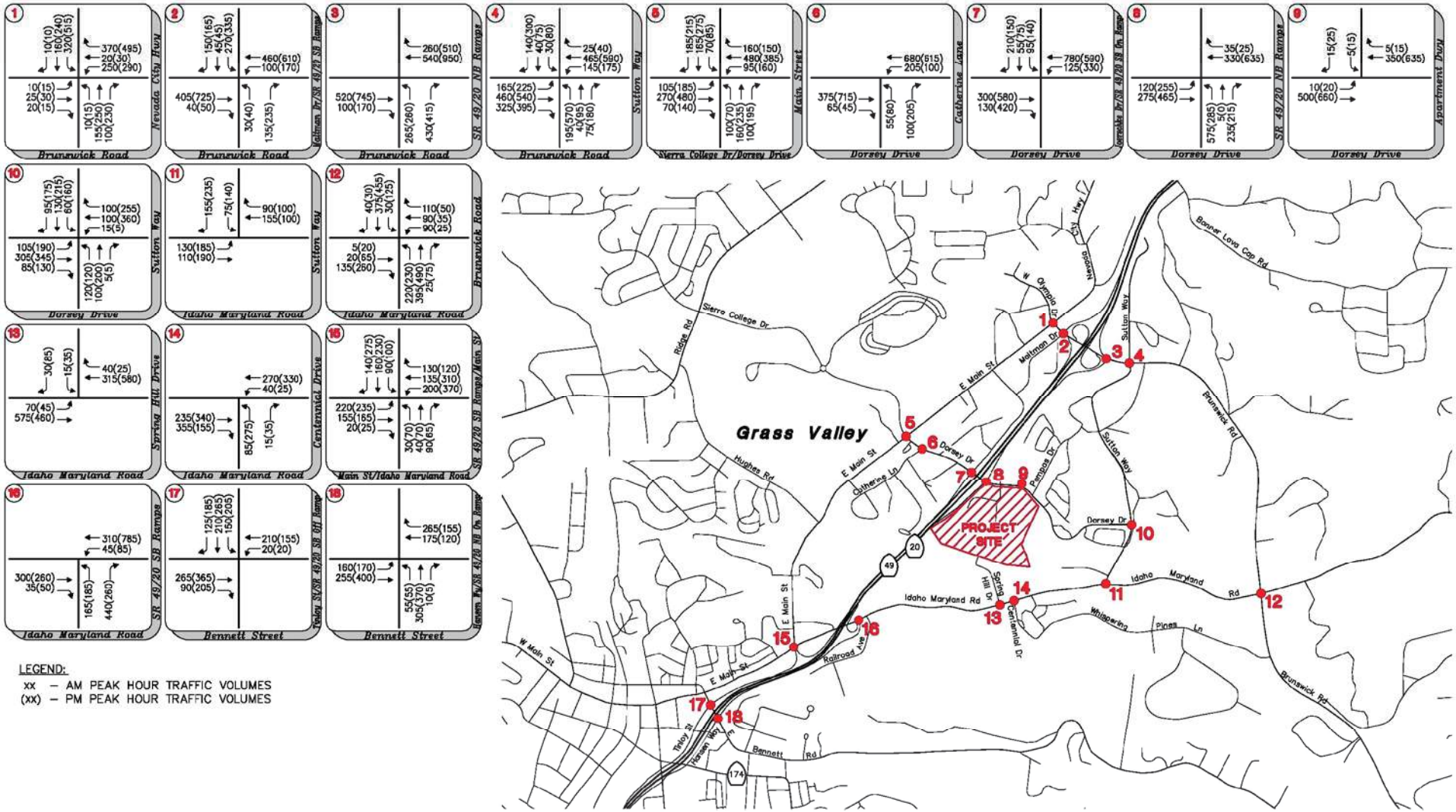
SOURCE: Omni Means 2018

FIGURE 8-2

Existing Plus Alternative B Peak Hour Traffic Volumes

Dorsey Marketplace EIR

DUDEK



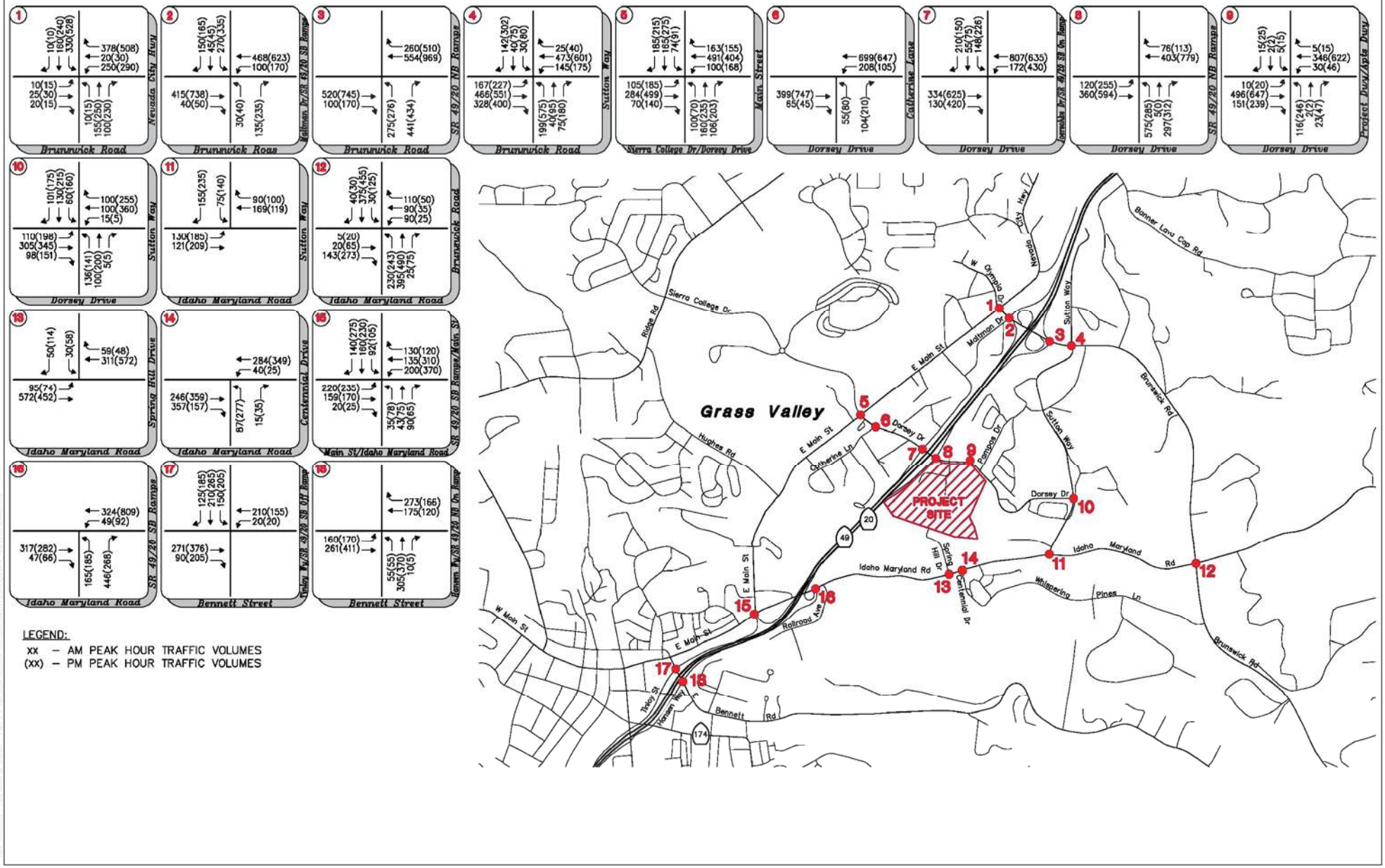
SOURCE: Omni Means 2018

FIGURE 8-3

Year 2035 No Project Peak Hour Traffic Volumes

Dorsey Marketplace EIR

DUDEK



SOURCE: Omni Means 2018

FIGURE 8-4

Year 2035 Plus Alternative B Peak Hour Traffic Volumes

Dorsey Marketplace EIR

DUDEK

CHAPTER 9
NOISE

This section describes the ambient noise environment and noise sensitive land uses proximate to the proposed Dorsey Marketplace (proposed project) site, identifies regulatory restrictions and policy requirements, evaluates potential impacts, and identifies mitigation measures, where necessary, required in order to reduce of avoid potentially significant impacts associated with implementation of the proposed project. Two versions of the project are evaluated in this section. Alternative A would provide for up to 90 multi-family residential units, a 3,200-square foot clubhouse, and approximately 178,960 square feet of commercial space. Alternative B would provide ~~171~~ 172 multi-family residential units, a 3,200-square foot clubhouse, approximately 104,350 square feet of commercial space, and approximately 8,500 square feet of office space.

The information presented in this section is based on a review of the project plans, traffic noise modeling to estimate project related traffic noise, the *City of Grass Valley 2020 General Plan* (City of Grass Valley 1999), and the Environmental Noise ~~Analysis~~ Data prepared for the project (Appendix H).

No comments were received in response to the Notice of Preparation regarding noise. The Notice of Preparation and comment letters received in response to it are included in Appendix A.

9.1 ENVIRONMENTAL SETTING

This section describes the existing noise environment in and around the project site, based upon site reconnaissance and sound level measurements, including receptors that may potentially be affected by noise. The discussion also describes the fundamentals of acoustics and summarizes regulations and ordinances that form the basis of the criteria used to evaluate the effect of project-generated noise upon the existing noise environment.

Characteristics of Environmental Noise

Fundamentals of Acoustics

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that disrupts or interferes with normal human activities. Although exposure to high noise levels over an extended period has been demonstrated to cause hearing loss, the principal human response to noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, the type of activity during which the noise occurs, and the sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by a number of

variables including frequency and intensity. Frequency describes the sound's pitch and is measured in Hertz (Hz), while intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above approximately 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels. The minimum change in the sound level of individual events that an average human ear can detect is approximately 3 dB. An increase (or decrease) in sound level of approximately 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, this relation holds true for loud sounds and for quieter sounds.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:

$$60 \text{ dB} + 60 \text{ dB} = 63 \text{ dB}, \text{ and}$$

$$80 \text{ dB} + 80 \text{ dB} = 83 \text{ dB}$$

Hertz is a measure of how many times each second the crest of a sound pressure wave passes a fixed point. For example, when a drummer beats a drum, the skin of the drum vibrates a number of times per second. A particular tone which makes the drum vibrate 100 times per second generates a sound pressure wave that is oscillating at 100 Hz; this pressure oscillation is perceived as a tonal pitch of 100 Hz. Sound frequencies between 20 Hz and 20,000 Hz are within the range of sensitivity of the human ear.

Sound from a tuning fork (a pure tone) contains a single frequency. In contrast, most sounds heard in the environment consist of a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound according to a weighting system that reflects the fact that human hearing is less sensitive at low frequencies and extremely high frequencies than at the mid-range frequencies. This is called "A" weighting, and the decibel level measured is called the A-weighted sound level (dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve, which de-emphasizes low and high frequencies of sound in a manner similar to the human ear.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from several sources that creates a relatively steady background noise in which no particular source is identifiable. A single descriptor called the equivalent sound level

(L_{eq}) represents the "equivalent" constant sound level that would have to be produced by a given source to equal the fluctuating level measured. L_{eq} is the mean A-weighted sound level during a measured time interval. In addition, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the L_{max} and L_{min} indicators. They represent the maximum and minimum noise levels occurring during a given sound level measurement.

To describe the time-varying character of environmental noise, the statistical noise descriptors L_{10}, L_{50}, and L_{90} are commonly used. They are the noise levels equaled or exceeded during 10%, 50%, and 90% of a stated time. Sound levels associated with the L_{10} typically describe transient or short-term events, while levels associated with the L_{90} describe the steady-state (or most prevalent) noise conditions.

Another sound measure known as the day/night average noise level (L_{dn}) is defined as the A-weighted average sound level for a 24-hour day. It is calculated by adding a 10 dBA penalty to sound levels in the night (10:00 p.m. to 7:00 a.m.) to compensate for the increased sensitivity to noise during the quieter evening and nighttime hours. The L_{dn} is used by agencies such as the U.S. Department of Housing and Urban Development, the State of California, Placer County, and the Town of Loomis (Town) to define acceptable land use compatibility with respect to noise.

Exterior Noise Distance Attenuation

Noise sources are classified in two forms: (1) point sources, such as stationary equipment or a group of construction vehicles and equipment working within a spatially limited area at a given time, and (2) line sources, such as a roadway with a large number of pass-by sources (motor vehicles). Point source generated sound typically diminishes (attenuates) for each doubling of distance from the source to the receptor at a rate of 6.0 dBA at acoustically "hard sites" and a rate of 7.5 dBA for acoustically "soft" sites. Line source generated sound typically attenuates at a rate of 3 dBA and 4.5 dBA per doubling distance, for hard and soft sites, respectively. For the purpose of sound attenuation, a "hard" or reflective site does not provide any excess ground-effect attenuation and is characteristic of asphalt or concrete ground surfaces and very hard-packed soils. Whereas an acoustically "soft" or absorptive site is characteristic of unpaved loose soil or vegetated ground.

Structural Noise Attenuation

Sound levels can also be attenuated by man-made or natural barriers. Structures can provide additional noise reduction by insulating interior spaces from outdoor noise. The outside-to-inside noise attenuation provided by typical structures in California ranges between 17 and 30 dBA with open and closed windows, respectively, as shown in Table 9-1.

Table 9-1
Outside-to-Inside Noise Attenuation (dBA)

Building Type	Open Windows	Closed Windows
Residences	17	25
Schools	17	25
Churches	20	30
Hospitals/Offices/Hotels	17	25
Theaters	17	25

Source: TRB 2013

Community Noise

Community noise is commonly described in terms of the "ambient" noise level, which is defined as the all-encompassing noise level associated with a given noise environment. The L_{dn} is based upon the average noise level over a 24-hour day, with a +10 dB weighting applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment. Where short-term noise sources are an issue, noise impacts may be assessed in terms of maximum noise levels, hourly averages, or other statistical descriptors.

Perception of Loudness

The perceived loudness of sounds and corresponding reactions to noise are dependent upon many factors, including sound pressure level, duration of intrusive sound, frequency of occurrence, time of occurrence, and frequency content. As mentioned above; however, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the frequency response of a sound level meter by means of the standardized A-weighing network. Table 9-2 shows examples of noise levels for several common noise sources and environments.

Table 9-2
Typical Sound Levels in the Environment and Industry

Common Outdoor Activities	Noise Level (dB)	Common Indoor Activities
—	110	Rock band
Jet fly over at 300 meters (1,000 feet)	100	—
Gas lawn mower at 1 meter (3 feet)	90	—
Diesel truck at 15 meters (50 feet), at 80 kilometers per hour (50 miles per hour)	80	Food blender at 1 meter (3 feet); garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime; gas lawn mower at 30 meters (100 feet)	70	Vacuum cleaner at 3 meters (10 feet)

Table 9-2
Typical Sound Levels in the Environment and Industry

Common Outdoor Activities	Noise Level (dB)	Common Indoor Activities
Commercial area; heavy traffic at 90 meters (300 feet)	60	Normal speech at 1 meter (3 feet)
Quite urban, daytime	50	Large business office; dishwasher next room
Quite urban, nighttime	40	Theater; large conference room (background)
Quite suburban, nighttime	30	Library
Quite rural, nighttime	20	Bedroom at night; concert hall (background)
—	10	Broadcast/recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans 2013

Fundamentals of Vibration

Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or acceleration. Although the response of humans to vibration is very complex, it is generally accepted that human response is bet approximated by the vibration velocity level associated with the vibration occurrence.

Heavy equipment operation, including stationary equipment that produces substantial oscillation or construction equipment that causes percussive action against the ground surface, may be felt by building occupants. Ground-borne vibration commonly causes windows, pictures on walls, or items on shelves to rattle but would seldom be of sufficient magnitude to cause even minor cosmetic damage to buildings.

When evaluating human response, ground-borne vibration is usually expressed in terms of root mean square (RMS) vibration velocity. RMS is defined as the average of the squared amplitude of the vibration signal. As for sound, vibration amplitudes are commonly expressed in terms of decibels defined as:

$$L_v = 20 \log \left(\frac{v_{rms}}{v_{ref}} \right)$$

Where v_{rms} is the RMS vibration velocity amplitude in inches/second and v_{ref} is the decibel reference of $1x10^{-6}$ inches/second.

To avoid confusion with sound decibels, the abbreviation VdB is used for vibration decibels. The vibration threshold of perception for most people is around 65 VdB (which is equivalent to 0.0018 inches/second RMS). Vibration levels in the 70-75 VdB rnage are often noticeable, but generally deemed acceptable, and levels in excess of 80 VdB are often considered unacceptable (FTA 2006).

Existing General Ambient Noise Environment

Dudek visited the proposed project site on February 29 and March 1, 2016 to measure ambient sound levels in the vicinity. Figure 9-1 shows the measurement locations marked on a site map.

Short-term (ST#) measurements were conducted with a Larson Davis 820 sound level meter placed on a tripod with the microphone positioned approximately 5 feet above the ground. The Larson Davis 820 is classified as an ANSI Type 1 precision sound level meter. The sound level meter was calibrated before the measurement series in order to ensure accuracy of the measurements. The short-term measurements were 5 to 20 min long depending on the location. Table 9-3 presents the results of the short-term noise measurements with traffic count information.

Table 9-3
Short-Term Sound Level Measurements

Location	Distance to Roadway Edge	Observed Noise Sources	L_{eq}[1]	Cars	MT	HT[2]	MC[1]
ST1: Spring Hill Drive	10 feet	Traffic, Aircraft	61	27	1	0	0
ST2: Dorsey Drive	9 feet	Traffic,	67	111	0	0	1
ST3: State Route 20/49	80 feet	Traffic	73	453	3	9	2

Notes:
1 Equivalent Continuous Sound Level (Time-Average Sound Level)
2 Medium Trucks
3 Heavy Trucks
4 Motorcycles
* Environmental Weather Conditions: Temperature: 68°F, partly cloudy, 3 miles-per-hour light/gusty northeast wind

The long-term measurements were completed using four Soft DB Piccolo sound level meters. The Piccolo sound level meters meet the ANSI standard for a Type 2 general-purpose sound level meter. The meters collected hourly sound level data from February 29 to March 1, 2016. The Piccolo sound level meters were each calibrated before the measurements to ensure accuracy of the measurements. The recorded hourly equivalent levels (Leq) were appropriately weighted in the evening and overnight periods, and then averaged to produce the CNEL and Ldn results presented in Table 9-4.

Table 9-4
Long-Term Sound Level Measurements

Site/ Instrument #	Location Description	(dBA)	
		CNEL	L_{dn}
LT1	Northeast of Site at adjacent residences	51	51
LT2	South of Site near Industrial Area	55	55

Measurement results show Community Noise Exposure Levels range from 55 to 51 dBA in the site vicinity. The higher levels occur in close proximity to the major roads. LT2, located near the truck area south of the site, has high measured noise levels during the early morning (5-7 am) and nighttime hours that contribute to a higher CNEL.

Modeled Existing Transportation Noise

Vehicular traffic along vicinity roadways is typically a primary contributor to the overall noise environment in any urban neighborhood. Using current average daily traffic data and CadnaA, noise modeling software, Dudek modeled the CNEL associated with the local roadway network. Figure 9-2 shows modeled receiver locations. The existing sensitive receptors that are proximate to roadways that would be used by project-generated traffic are the residential land uses located along Dorsey Drive north and east of the project site. Table 9-5 below shows the Average Daily Traffic data for Dorsey Drive that was used for the traffic noise modeling. Results for the existing traffic noise are shown in this section, while future results for the residential component of the project are presented in later sections.

Table 9-5
Average Daily Traffic Volumes for Vicinity Roadways

ID	Existing	Existing + Project	2035	2035 + Project
Dorsey Drive over SR 20/49	1040	1289	1470	1689
Dorsey Drive north of project site	542	947	1108	1467
Dorsey Drive from Springhill Garden Apartments to Sutton Way	528	558	1093	1149
SR 20/49*	~~29350~~41,000	~~29350~~42,000	~~29350~~56,000	~~29350~~57,000

Source: Appendix G
* **Source:** Caltrans 2016

Table 9-6 presents the results of the noise modeling for the nearest existing sensitive receptors, as shown on Figure 9-2.

Table 9-6
Existing CNEL for Vicinity Roadways

Receiver Name	Existing CNEL (dBA)
M4_Existing Multifamily East of Site	52
M5_Existing Single Family Near Highway 49	69
M6_Existing Single Family on Mulberry	53

Source: Appendix H

Existing CNEL levels associated with the vicinity road network are generally compatible with the established uses in most places. The noise levels for existing traffic are above 65 dBA CNEL at locations near Highway 49. The majority of residential land uses farther from Highway 49 have existing traffic noise levels below 60 dBA Ldn.

9.2 REGULATORY SETTING

Federal Regulations

Federal Highway Administration (FHWA) Standards

CFR Title 23, part 772 sets procedures for abatement of highway traffic noise and construction noise. Title 23 is implemented by the Federal Department of Transportation (DOT) Federal Highway Administration (FHWA). This regulation provides procedures for noise studies and noise abatement measures to help protect public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways. All highway projects developed in conformance with this regulation shall be deemed to be in conformance with the DOT-FHWA Noise Standards. Title 23 establishes a 67 dBA $L_{eq}(h)$ standard applicable to federal highway projects for evaluating impacts to land uses including residences, recreational uses, hotels, hospitals, and libraries (23 CFR Chapter 1, Part 772, Section 772.19).

Federal Transit Administration and Federal Railroad Administration Standards

Although the Federal Transit Administration (FTA) standards are intended for federally funded mass transit projects, the impact assessment procedures and criteria including in the FTA Transit Noise and Vibration Impact Assessment Manual (FTA 2006) are routinely used for projects proposed by local jurisdictions. The FTA significance threshold for architectural damage to timber and unreinforced masonry structures is 0.2 inch/second peak particle velocity (PPV).

Federal Interagency Committee on Noise

The 1992 findings of the Federal Interagency Committee on Noise (FICON), which assessed the annoyance effects of changes in ambient noise levels resulting from aircraft operations, provide some guidance as to the significance of changes in ambient noise levels due to transportation noise sources. The rationale for the FICON recommendations is that it is possible to consistently describe the annoyance of people exposed to transportation noise in terms of L_{dn}. The changes in noise exposure relative to existing noise levels, as shown in Table 9-7, are considered to be noticeable changes that result in increased annoyance experienced at sensitive land uses. Although the FICON recommendations were specifically developed to address aircraft noise impacts, they are also

applicable to other transportation noise sources such as roadways, and are used in this analysis for traffic noise described in terms of L_{dn}.

As shown in Table 9-7, an increase in noise from similar sources of 5 dB or more would be noticeable where the ambient level is less than 60 dB. Where the ambient level is between 60 and 65 dB, an increase in noise of 3 dB or more would be noticeable, and an increase of 1.5 dB or more would be noticeable where the ambient noise level exceeds 65 dB Ldn. The rationale for the criteria shown in Table 9-7 is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

Table 9-7
Measures of Substantial Increase for Transportation Noise Exposure

Ambient Noise Level Without Project	Significant Impact Occurs if the Project Increases Ambient Noise Levels by:
<60 dBA	+ 5 dB or more
<60–65 dBA	+ 3 dB or more
>65 dBA	+ 1.5 dB or more

Source: FICON 1992

State Regulations

California Noise Control Act of 1973

California Health and Safety Code Sections 46000 through 46080, known as the California Noise Control Act of 1973, declares that excessive noise is a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. The Act identifies a continuous and increase bombardment of noise in the urban, suburban, and rural areas and declares that California has a responsibility to protect the health and welfare of its citizens by the control, prevention and abatement of noise.

California Noise Insulation Standards (CCR Title 24)

Noise insulation standards for hotels, motels, dormitories, and multi-family residence buildings were adopted in 1974 by the California Commission on Housing and Community Development (CCR Title 24, Part 2). Title 24 establishes standards for interior room noise (attributable to outside noise sources) and specifies that acoustical studies must be prepared whenever a multi-family residence building or structure is proposed to be located in an area with CNEL (or L_{dn}) of 60 dBA or greater. The acoustical analysis must demonstrate that the residence has been designed to limit intruding noise to an interior CNEL (or L_{dn}) of no greater than 45 dBA (California's Title 24 Noise Standards, Chap. 2-35).

Local Regulations

City of Grass Valley Municipal Code

Chapter 8.28 of the Grass Valley Municipal Code is known as the Noise Ordinance. The ordinance establishes standards to be considered in determining whether a violation of this ordinance exists, as well as provisions for sound amplifying equipment, vehicles and vehicle repair, musical instruments and construction. According to Section 8.28.100, construction equipment or performance of outdoor construction and repair work shall not occur between the hours of 7:00 p.m. and 7:00 a.m. Monday through Saturday and not at all on Sunday or legal holidays. The noise ordinance provides ambient noise levels for land use zones as follows:

Decibels	Time	Zone
45 dBA	8:00 p.m. to 7:00 a.m.	Residential
55 dBA	7:00 a.m. to 8:00 p.m.	Residential
65 dBA	Anytime	Commercial
70 dBA	Anytime	All other zones

Source: City of Grass Valley 2013

City of Grass Valley General Plan

The City of Grass Valley General Plan Noise (N) Element identifies noise problems and forms a basis for land use distribution within the City. This element identifies goals (G), objectives (O), policies (P), and implementation measures (I) related to improving and maintaining appropriate levels of noise in the City. The following goal, objectives, policies and implementation measures apply to the proposed project:

1-NG: Protect Grass Valley's relatively quiet environment from unnecessary, annoying and potentially damaging noise.

1-NO: Coordination of transportation and land use planning to assure acceptable noise levels.

3-NO: Establishment of a pattern of land uses that minimizes exposure of community residents to excessive noise.

2-NP: Perform adequate acoustical analyses prior to approval of new development projects or transportation facilities, if warranted.

4-NP: Adopt appropriate noise level standards for existing and future residential areas.

6-NP: Locate sensitive land uses (residential neighborhoods, medical facilities, senior care facilities and schools) away from high noise areas.

1-NI: Prohibit development of new noise sensitive land uses where the noise level due to fixed noise sources will exceed the noise level standards of Table 9-8 (as measured immediately within the property line or within a designated outdoor activity area of the new development) unless effective noise mitigation measures have been incorporated into development design to achieve standards specified in Table 9-8.

5-NI: Prohibit new development of noise-sensitive land uses in areas exposed to existing or projected future levels of noise from transportation noise sources which exceed the levels specified in Table 9-9, unless the project design includes effective mitigation measures to reduce exterior noise and noise levels in interior spaces to levels specified in Table 9-9.

9-NI: Require an acoustical analysis and appropriate mitigation measures where noise-sensitive land uses are proposed in areas exposed to existing or projected exterior noise levels exceeding the levels specified in Table 9-8 and 9-9.

Table 9-8
Noise Level Performance Standards from Fixed Noise Sources Applicable to Proposed Noise-Sensitive Uses

Noise Level Descriptor	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
Hourly L_{eq} dB	55	50
Maximum level dB	75	65

Note: Each of the noise levels specified above shall be lowered by five dB for simple tone noises, noises consisting of primarily speech or music, or for recurring impulsive noises (e.g., humming sounds, outdoor speakers systems, shooting ranges). These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).
Source: City of Grass Valley, 1999

Table 9-9
Maximum Allowable Noise Exposure Transportation Noise Sources Applicable to Proposed Noise-Sensitive Uses

Land Use	L_{dn}/CNEL, dB, at Outdoor Activity Areas	Interior Spaces	
		L_{dn}/CNEL dB	L_{eq} dB[1]
Residential	60[2]	45	--
Transient Lodging	60[3]	45	--
Hospitals, Nursing Homes	60[2]	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60[2]	--	40
Office Buildings	--	--	45

Table 9-9
Maximum Allowable Noise Exposure Transportation Noise Sources
Applicable to Proposed Noise-Sensitive Uses

Land Use	L_{dn}/CNEL, dB, at Outdoor Activity Areas	Interior Spaces	
		L_{dn}/CNEL dB	L_{eq} dB[1]
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

Notes:
1. As determined for a typical worst-case hour during periods of use.
2. Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.
3. In the case of hotel/motel facilities or other transient lodging, there may be no designated outdoor activity areas (e.g., pool areas). In such cases, only the interior noise level criterion will apply.

Source: City of Grass Valley, 1999

10-NI: Apply the following standards and practices to acoustical analyses:

- Where the locations of outdoor activity areas are not known or designated, the exterior noise level standards shall be applied immediately inside the property line of the receiving land use.
- In rural areas with large residential lots, the exterior noise level standard shall be applied at a point 100 feet from the residence.
- Where it is not practical to mitigate exterior noise levels at patios or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.
- Where noise mitigation measures are required to achieve the standards of Table 9-8 and Table 9-9, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered a means of achieving the noise standards only after other practical design-related noise mitigation measures have been integrated into the project.
- When determining the effectiveness of noise mitigation measures, the noise standards shall be applied on the receptor side of noise barriers or other property line noise mitigation measures.
- If dwellings are located and constructed in accordance with the Noise Element, it may be assumed that the resulting exterior and interior levels will conform to the noise standards imposed by lending agencies such as HUD, FHA, and CalVet. Construction of new single-family dwellings or modification of existing dwellings

in developed areas may not be subject to City review with respect to satisfaction of the standards of the Noise Element. As a consequence, such dwellings may be constructed or modified in areas where noise levels exceed the standards of the Noise Element. It is not the responsibility of the City to ensure that such dwellings meet the noise standards of the Noise Element, or the HUD/FHA/CalVet noise standards.

9.3 IMPACTS

Significance Criteria

Potential impacts associated with noise have been evaluated using the following criteria, as identified in Appendix G of the CEQA Guidelines:

- 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,
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels,
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, or
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Methods of Analysis

The FHWA Roadway Construction Noise Model (RCNM) (FHWA 2008) was used to estimate construction noise levels at the nearest existing noise-sensitive land uses. Although the model was created by the FHWA, RCNM is often used for non-roadway projects, because the same types of construction equipment used for roadways are also used for constructing most other projects as well. Input variables for the RCNM consist of the receiver/land use types, the equipment type and number of each (e.g., two graders, a loader, a tractor), the duty cycle for each piece of equipment (e.g., percentage the equipment typically works in a given time period), and the distance from the construction equipment/activity to the noise-sensitive receiver. No topographical or structural shielding was assumed in the modeling. RCNM has default duty-cycle values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Those default duty-cycle values were used for this noise analysis.

The CadnaA noise modeling software was used to model noise generated by existing and future traffic on vicinity roadways affecting the project site. Future traffic volumes are based on data included in the

project traffic study (Appendix G). Model runs were performed using the traffic data to represent each of the different traffic scenarios contained in the traffic impact analysis.

For the assessment of roadway traffic noise increases resulting from project trips, receivers to represent existing noise-sensitive (i.e., residential) land uses in the project vicinity were included in the model, in addition to the sound level measurement locations used to calibrate the traffic noise model. Receiver locations to represent future on-site residential uses were also included in the model, to assess traffic noise exposure levels at such residences from future predicted roadway traffic. The receiver locations were placed approximately 5 feet above the ground level to model ear height of receivers.

Impact Analysis

Impact 9-1: Would the project expose persons to or generate noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially Significant	Potentially Significant
Mitigation measures:	Mitigation Measure 9b	Mitigation Measures 9a and 9b
Significance after mitigation:	Less Than Significant	Less Than Significant

Alternative A and Alternative B

On-Site Receivers

Development of multi-family units at the project site could result in the exposure of on-site residents to traffic noise levels and fixed source noise levels (i.e., industrial or commercial facilities) that exceed standards contained in the Grass Valley Noise Element and Noise Ordinance. In addition, the project would have noise-generating characteristics including noise from short-term construction activities, introduction of new mechanical equipment, and new commercial and residential activities that could increase ambient noise levels at vicinity noise-sensitive land uses. Lastly, and the project would contribute trips to area roadways with attendant increases in off-site roadway traffic noise levels. Traffic noise increases related to the project, and experienced at existing off-site residential locations, is discussed under Impacts 9-3 and 9-5.

The noise modeling completed for this project placed modeling receivers at locations that represent the future residential land uses within the project site as well as at locations of existing noise-sensitive receptors in the project vicinity.

As shown in Figure 9-2, Noise Modeling Locations, receiver locations M1, M2, M3, M7 and M8 represent future residential locations within the project site. M1 is located at the southwest corner of the residential part of the project, east of the proposed extension of Spring Hill Drive along the

southern portion of the project site. M2 is located at the northern portion of the residential development area near the existing multifamily development to the east. M3 is placed near the center of the residential area in the southeastern portion of the project site. M7 is located on the east side of Spring Hill Drive. M8 represents residential receivers closer to SRR 20/49, in the area of the office and residential development area under Alternative B.

Table 9-10 provides the results of future traffic noise modeling at on-site receivers, selected as representative of future worst-case traffic noise exposure for proposed residential locations.

Table 9-10
Future Traffic Noise Exposure Levels at On-Site Residences

Modeled Receptor	Future (dBA)
M1_Proposed Multifamily Residential Adjacent to Spring Hill Drive	61
M2_Existing Multifamily Residential	55
M3_Proposed Multifamily Residential	56
M7_Proposed Multifamily Residential East of Spring Hill Drive	56
M8_Proposed Office/Multifamily Residential west of Spring Hill Drive (Alternative B Only)	61

Source: Appendix H

As indicated in Table 9-10, the representative residential receiver locations have expected traffic noise levels between 55 and 61 dBA CNEL. The residential modeling location on the west side of Spring Hill Drive may exceed 60 dBA Ldn, which is the maximum allowable noise exposure for noise-sensitive uses from transportation sources as established in the Grass Valley General Plan Noise Element (City of Grass Valley 1999). Additional calculations show that residential land uses on the east side of Spring Hill Drive would have levels of 60 dBA Ldn or less. Thus under Alternative A, the project would have **less-than-significant** impacts associated with future traffic noise exposure levels for residential uses within the project site. Under Alternative B, residential land uses are proposed to be located between SR 20/49 and Spring Hill Drive where traffic noise would exceed 60 dB Ldn; consequently traffic noise exposure impacts for residences located between SR 20/49 and Spring Hill Drive under Alternative B would be **potentially significant**.

To ensure traffic noise exposure impacts for residences remain less than significant, under Alternative B the project would be required to implement *Mitigation Measure 9a*. This measure requires construction of a sound attenuation barrier and increased construction standards for the residential units located on the west side of Spring Hill Drive. The sound attenuation barrier would reduce the noise exposure for the first floor of the residential and office buildings located nearest to SR 20/49, but due to reduced ground absorption and topographic shielding at elevated positions, traffic noise levels at the second and third floors would be approximately 4 dBA higher than first-floor levels. In addition, the upper floor façades would not be shielded by the required noise attenuation barrier. Because noise levels at the second and third floors of the residences proposed

adjacent to SR 20/49 would exceed the City's standards, Mitigation Measure 9a specifies that windows on those buildings where a direct line of sight to SR 20/49 and/or the highway off-ramp must have a minimum Sound Transmission Class (STC) rating of 32. Implementation of *Mitigation Measure 9a* would reduce potential impacts to a **less-than-significant** level.

Operational On-Site Impacts

Under both Alternative A and Alternative B, the project would develop several commercial buildings. Under Alternative A, there would be approximately 178,960 square feet of commercial land uses, while Alternative B includes approximately 104,350 square feet of commercial uses. As shown in the site plans in Figure 2-4, Alternative A Site Plan, and Figure 2-5, Alternative B Site Plan, setbacks between the commercial and residential areas would be at least 25 feet.

Under Alternative A, the proposed residential uses may be exposed to mechanical equipment and truck delivery noise associated with Shops C, D, and E located north of the residential area and Major 4 located west of the residential area. The building pads for the apartment buildings nearest to Shops C, D, and E would be approximately 7 feet lower in elevation than the building pads for these shops. This would result in exposure of the residential units on the second and third floors of the apartment buildings to mechanical equipment and truck delivery noise. The apartment building immediately south of Shops C, D, and E would be at the same elevation as Major 4, thus the units on the western end of this building could be exposed to truck delivery noise and mechanical equipment noise associated with Major 4. The apartment buildings along the southern project site boundary would be a minimum of 15 feet lower in elevation than Major 4 and would not be exposed to truck delivery and mechanical equipment noise. The proposed delivery schedule for trucks associated with the commercial spaces, the configuration of the loading dock area, and the location of exterior mechanical equipment to be associated with the commercial structures have not been specified at this time. Methods including the selection of low sound generating mechanical equipment, use of screen walls or roof parapet, restriction of delivery schedules, and noise barriers (sound walls) are available to address elevated noise levels from the commercial component, if necessary. Once detailed construction plans for the commercial and residential buildings are available, an accurate noise assessment can be conducted and noise control methods identified. To ensure that noise levels within the apartment units in the two buildings immediately south of Shops C, D, and E would meet the City of Grass Valley standards for interior noise levels, Mitigation Measure 9b requires that a noise assessment be performed to address potential noise impacts from truck deliveries and mechanical equipment associated with Shops C, D, and E and Major 4. The noise assessment must identify noise barriers for the commercial noise sources and/or increased construction standards for the residential structures that would ensure the interior noise levels are acceptable.

Alternative B would have the same potential for the proposed residential uses immediately south of Shops C, D, and E to be exposed to mechanical equipment and truck delivery noise. The proposed

apartment building closest to Major 1 could also be exposed to mechanical equipment noise from that building. The loading dock for Major 1 is located at the rear of that building and would not be within a direct line of sight to the proposed residential uses, thus exposure to truck delivery noise is not anticipated. As with Alternative A, the building pads for the apartment buildings nearest to Shops C, D, and E would be approximately 7 feet lower in elevation than the building pads for these shops, thus residential units on the second and third floors of these apartment buildings could be exposed to mechanical equipment and truck delivery noise. The proposed delivery schedule for trucks associated with the commercial spaces, the configuration of the loading dock area, and the location of exterior mechanical equipment to be associated with the commercial structures have not been specified at this time. Methods including the selection of low sound generating mechanical equipment, use of screen walls or roof parapet, restriction of delivery schedules, and noise barriers (sound walls) are available to address elevated noise levels from the commercial component, if necessary. Once detailed construction plans for the commercial and residential buildings are available, an accurate noise assessment can be conducted and noise control methods identified. To ensure that noise levels within the apartment units in the two buildings immediately south of Shops C, D, and E and the apartment building nearest to Major 1 would meet the City of Grass Valley standards for interior noise levels, Mitigation Measure 9b requires that a noise assessment be performed to address potential noise impacts from truck deliveries and mechanical equipment associated with Shops C, D, and E and Major 4. The noise assessment must identify noise barriers for the commercial noise sources and/or increased construction standards for the residential structures that would ensure the interior noise levels are acceptable. Implementation of Mitigation Measure 9b would reduce this impact to a **less-than-significant** level.

Impact 9-2: Would the project expose persons to or generate excessive ground-borne vibration or ground-borne noise?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less Than Significant	Less Than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less Than Significant	Less Than Significant

Alternative A and Alternative B

The proposed residential and commercial land uses under Alternative A and the proposed residential, commercial, and office land uses under Alternative B would not result in the use of equipment or activities capable of producing substantial long-term ground borne vibration or ground borne noise levels. The only ground vibration potential would be associated with site development and short-term construction.

Construction of the proposed land uses would not be expected to employ the most significant vibration-producing construction equipment and/or activities (i.e. pile-driving and blasting) that could generate vibration levels potentially damaging to adjacent structures. However, during land

clearing and construction activities at the project site, ground-borne vibration would be produced by heavy-duty construction equipment which may be perceptible to adjacent residents or building occupants. The most important equipment relative to generation of vibration, and the vibration levels produced by such equipment, is illustrated in Table 9-11. This information was compiled by the Federal Transit Authority for use in assessing construction vibration impacts from major transportation projects.

Table 9-11
Vibration Velocities for Typical Construction Equipment

Equipment	PPV at 25 Feet (Inches Per Second)
Loaded Trucks	0.076
Drill Rig / Auger	0.089
Jackhammer	0.035
Small Bulldozer	0.003

Source: Federal Transit Authority 2006

As shown in Table 9-11, use of heavy equipment (e.g., an auger-type drill rig) generates vibration levels of 0.089 inches per second PPV at a distance of 25 feet. For the purpose of this analysis, the 0.2 inches/second PPV threshold is used as a damage criteria since it applies to engineered timber and masonry buildings similar to the existing residential buildings in the project vicinity. The threshold for annoyance of 0.1 inches/second PPV is applied to address both potential annoyance to residents and building occupants in close proximity to the site.

Existing multifamily residential land uses exist approximately 35 feet south of the project site. At a distance of 30 feet, the residual vibration from construction equipment with the highest vibration potential (drill rig/auger) would be expected to attenuate to approximately 0.061 inches/second PPV. Other typical construction activities and equipment, including small bulldozers, loaded trucks and jackhammers, would have lower vibration levels at the existing adjacent residences. Since the expected vibration levels at the nearest residences would be less than even the threshold for annoyance (0.1 inches/second PPV), impacts associated with short-term construction-related ground vibration would be **less than significant**.

Impact 9-3: Would the project substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially Significant	Potentially Significant
Mitigation measures:	Mitigation Measure 9c	Mitigation Measure 9c
Significance after mitigation:	Less Than Significant	Less Than Significant

Alternative A and Alternative B

Activity noise associated with proposed residences at the project site would be similar to and consistent with existing uses within the project vicinity, and would therefore not be anticipated to be distinct from the ambient noise environment created by surrounding commercial and residential uses. With regard to fixed sources noise, the location and specifications of mechanical equipment that would be used for the residential development at the project site is not available at this time. However, this equipment could be audible at the existing apartments (i.e., a noise-sensitive residential land use) adjacent to the east of the site resulting in a **potentially significant** noise impact. Mitigation Measure 9c requires that a noise assessment of the mechanical equipment be completed to identify the noise level to which adjacent neighbors could be exposed and to identify noise control methods (such as placing equipment further from the adjacent neighbors and using barriers to screen the equipment) sufficient to ensure that noise levels at the nearest sensitive receptor do not exceed 55 dBA during daytime hours and 50 dBA during nighttime hours. This would ensure that noise levels remain within the acceptable noise range established by the City of Grass Valley and that impacts associated with mechanical noise at the project site would be **less than significant**.

Development of residential land uses at the project site would result in an increase in noise levels associated with additional vehicle trips added to vicinity streets from the project. This increase in traffic noise would be the primary noise impact related to development of residences at the project site.

Based on the project traffic study data (Appendix G), a traffic noise analysis was conducted to quantify the impact of the proposed project on the traffic noise levels in the project vicinity.

To assess project-related traffic noise increases, receiver points M4, M5, and M6 were created in the noise model at the locations of existing residential land uses. M4 is located at the closest residential land use just east of the project. M5 is located north of the project site and adjacent to SR 20/49. This location models high noise levels that could be expected from SR 20/49 for existing residential land uses. M6 is located north of the project site across Dorsey Drive in a single-family residential area.

Table 9-12 shows the resulting modeled sound levels for the receiver locations representing existing noise-sensitive land uses in the project vicinity under the different traffic scenarios, and the increase in ambient noise levels expected due to development of the project site.

Table 9-12
Traffic Noise Level Results

Modeled Receptor	Existing (dBA)	Existing with Project (dBA)	Difference (dBA)	Future (dBA)	Future with Project (dBA)	Difference (dBA)
M4_MultifamilyResidentialToEast	52	52	<1	52	53	<1
M5_SingleFamNorthNextToHighway	69	69	<1	69	69	0
M6_SingleFamMulberry	53	53	<1	54	54	<1

Source: Appendix H

The addition of project-related traffic to the vicinity roadways would increase the CNEL by less than 1 dB, which is below the discernible level of change for the average human ear. Additionally, none of the modeled off-site receivers would experience increases in traffic noise levels that would go from less than 60 dBA Ldn to greater than 60 dBA Ldn. Therefore, the increase in off-site traffic noise from the development of the project site would be **less than significant**.

Impact 9-4: Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially Significant	Potentially Significant
Mitigation measures:	Mitigation Measure 9d	Mitigation Measure 9d
Significance after mitigation:	Less Than Significant	Less Than Significant

Alternative A and Alternative B

Construction is the most important source of a potential temporary increase in ambient noise levels due to the project. No periodic ambient noise increases would be expected in association with future development of mixed uses at the project site.

Construction of residences, commercial buildings, and offices at the project site could generate noise that could expose nearby receptors to elevated noise levels that may disrupt communication and routine activities. The magnitude of the impact would depend on the type of construction activity, equipment employed, duration of the construction, distance between the noise source and receiver, and the presence or absence of intervening structures. These construction characteristics would be the same for both alternatives.

Equipment that would be in operation during construction would likely include dozers, backhoes, graders, excavators, forklifts, cranes, compressors, paving equipment, and rollers. Typically, construction equipment operates in alternating cycles of full power and low power, producing average noise levels less than the maximum noise level. The average sound level of construction activity also depends on the amount of time that the equipment operates and the intensity of the construction activities during that time.

Construction Equipment Data and Description

The typical maximum noise levels for various pieces of construction equipment at a distance of 50 feet are presented in Table 9-13. For example, the maximum measured sound level from operation of a backhoe is 78 dBA at a distance of 50 feet.

Table 9-13
Typical Construction Equipment Noise Emission Levels and Usage Factors

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Measured L_{max} @50ft (dBA, slow)
Auger Drill Rig	No	20	84
Backhoe	No	40	78
Compactor (ground)	No	20	83
Compressor (air)	No	40	78
Concrete Mixer Truck	No	40	79
Concrete Pump Truck	No	20	81
Crane	No	16	81
Dozer	No	40	82
Dump Truck	No	40	76
Excavator	No	40	81
Flat Bed Truck	No	40	74
Front End Loader	No	40	79
Generator	No	50	81
Man Lift	No	20	75
Paver	No	50	77
Pickup Truck	No	40	75
Pneumatic Tools	No	50	85
Roller	No	20	80
Warning Horn	No	5	83

Source: DOT 2006.

Table 9-14 provides a summary of the assumed construction equipment used for the different phases of construction based on the air quality analysis conducted for the project.

Table 9-14
Construction Equipment by Phase

Construction Phase	Equipment	# of Devices
Laying Rock Base - General	Dozer	3
	Tractor	2
	Loader	1
	Backhoe	1
Site Preparation	Tractor	2
	Backhoe	1
	Front End Loader	1
	Dozer	3
Grading	Excavator	2
	Dozer	1
	Scrapper	2
	Front End Loader	1
	Tractor	1
	Grader	1
	Trencher	1
Building Construction	Generator	1
	Crane	1
	Man Lift	3
	Tractor	1
	Front End Loader	1
	Backhoe	1
	Welder / Torch	1
Paving	Paver	2
	Roller	2
	All Other Equipment > 5 HP	2
Architectural Coating	Compressor (air)	1

Using the FHWA RCNM construction noise model and construction information (types and number of construction equipment by phase), the estimated noise levels from construction were calculated for a representative range of distances, as presented in Table 9-15, Construction Noise Model Results Summary. The nearest receiver is about 30 feet from the construction operations. This receiver is intended to represent a worst case when construction operations occur near the site boundary along the existing residential land use to the east of the project site. R2 represents the typical distance from construction activities to the same receiver for when construction activities are concentrated away from the perimeter of the site (a distance of approximately 100 feet).

The RCNM inputs and outputs are provided in Appendix H.

Table 9-15
Construction Noise Modeling Summary Results

Construction Phase	L_{eq} (dBA)	
	Nearest Receiver 30'	*Typical Receiver 100'*
Laying Rock Base	89	79
Site Preparation	89	79
Grading/Utilities	92	82
Paving	83	74
Building Construction	91	82
Architectural Coating	78	68

Notes: L_{eq} = equivalent continuous sound level; dBA = A-weighted decibels;
Source: Appendix H

As presented in Table 9-15, the highest noise levels are predicted to occur during grading, when noise levels from construction activities would be expected to be approximately 92 dBA L_{eq} at the nearest existing residences, approximately 30 feet away. For the more typical case (construction activity averaging 100 feet from residences), construction noise levels would range up to 82 dBA L_{eq}.

Maximum and ~~A~~average noise levels from on-site construction activities would likely be annoying since levels are expected to be substantially higher than the ambient noise level in the site vicinity. This would be particularly true for the residential apartments located east of the project site. Restricting construction activities to the daytime period would avoid disruption during evening hours and overnight sleep periods, thus minimizing the potential for annoyance to occur.

The City of Grass Valley Noise Ordinance states that construction equipment or performance of outdoor construction and repair work shall not occur between the hours of 7:00 p.m. and 7:00 a.m. Monday through Saturday and not at all on Sunday or legal holidays. Average construction noise levels could range from approximately 68 dBA to 82 dBA Leq while maximum construction noise levels for the nearest receptors could range from 78 to 92 dBA Leq. The~~se~~ maximum levels are up to 37 dB ~~27 dB~~ above the daytime ambient noise level restriction for fixed source noise levels within noise-sensitive land use zones under the Grass Valley Noise Ordinance, while the average noise levels are up to 27 dB above the noise level restrictions. Therefore, temporary construction noise associated with development at the project site would be considered a **potentially significant** impact. Mitigation Measure 9d, which includes construction-related noise requirements, would reduce annoyance impacts. This includes requirements to place stationary equipment at least 150 feet from construction zone boundaries, or the use of individual barriers around such stationary equipment, which can reduce average noise levels by 6 to 8 dBA Leq (DOT 2006), and erection of a solid temporary barrier along the construction boundary between the construction area and the closest off-site receivers, which can reduce noise levels an additional 8 to 10 dBA Leq (DOT 2006). Based on the temporary and fluctuating nature of the construction noise and the addition of the mitigation

measure, construction noise would be reduced to a **less-than-significant** level with implementation of Mitigation Measure 9d.

Impact 9-5: Would the project result in traffic noise levels causing a substantial permanent increase in cumulative noise levels?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less Than Significant	Less Than Significant

Alternative A and Alternative B

As shown in Table 9-12, existing residences proximate to SR 20/49 are already exposed to noise levels that exceed the City's standards, and this is expected to continue in the cumulative scenario. Specifically, the existing and future noise level at modeling location M5 (north of the project site and adjacent to the east side of SR 20/49) is 69 dB, which exceeds the City's standard of 60 dB. Thus there is a significant cumulative impact in this location. Under both Alternative A and Alternative B, development of the project site would result in a net increase in traffic volume over the anticipated cumulative traffic volumes in the no project condition. However, as shown in Table 9-12, the traffic noise levels in the project vicinity in the "future with project" condition would increase less than 1 dB L_{dn} at the modeled noise sensitive receptors, compared to the future without project scenario, and the project-generated traffic would not cause any noise levels that are currently below 60 dB to increase above 60 dB. Further, the project-generated traffic would not cause the noise level at modeling location M5 to increase. Consequently, the project-related increases in future traffic noise levels would not make a cumulatively considerable contribution to the significant cumulative impact and the project's effects would remain **less than significant**.

9.4 MITIGATION MEASURES

Mitigation Measure 9a Under Alternative B only, a noise attenuation barrier shall be constructed between the proposed residential apartment buildings in the southwestern corner of the site and SR 20/49. Further, where windows on the second and third floors of buildings adjacent to SR 20/49 and its off-ramp have a direct line of sight to the highway and/or off-ramp shall have a minimum Sound Transmission Class (STC) rating of 32.

The noise attenuation barrier shall be a minimum height of 6 feet and shall be constructed of concrete or other solid material that is rigid and has a minimum density of 20 kilograms/square meter. Additionally, the noise attenuation barrier shall be constructed in accordance with the

Caltrans standards outlined in Chapter 1100 of the Highway Design Manual. The City of Grass Valley shall ensure that the noise barriers are shown on construction plans prior to issuance of grading permits and shall verify the barriers have been constructed as required prior to issuance of certificates of occupancy.

Mitigation Measure 9b Under Alternative A, a noise assessment shall be performed to address potential noise impacts to the apartment buildings immediately south of Shops C, D, and E to determine the exposure to noise from commercial mechanical equipment noise and truck delivery noise at Shops C, D, and E and at Major 4. Under Alternative B the noise assessment shall consider noise exposure associated with commercial mechanical equipment noise and truck delivery noise at Shops C, D, and E and at Major 1. For either alternative the assessment shall identify requirements to construct noise barriers for commercial noise sources and/or implement increased construction standards within the affected apartment buildings to ensure that interior noise levels will be 45 dB or less.

Mitigation Measure 9c Under Alternative A and Alternative B, a noise assessment of the mechanical equipment for the proposed residential units east of Spring Hill Drive shall be completed to identify the noise levels to which adjacent neighbors could be exposed and to identify noise control methods (such as placing equipment further from the adjacent neighbors and using barriers to screen the equipment) sufficient to ensure that noise levels at the nearest sensitive receptor do not exceed 55 dBA during daytime hours and 50 dBA during nighttime hours.

Mitigation Measure 9d Prior to issuance of grading and/or building permits, City staff shall ensure that project Grading and Building Plans identify locations for all stationary noise-generating construction equipment, such as air compressors, that are located as far as practical from nearby homes. The project applicant shall submit a list of the construction equipment proposed to be used (including horsepower), a schedule for the use of each piece of equipment during that phase, and the general location where each piece of equipment would operate. Where such equipment must be located near adjacent residences, project Grading and Improvement plans shall include provisions to provide reduce noise exposure to nearby receptors such as modifying the equipment

list, restrictions on the number of individual pieces of equipment that may be used at one time, modifying the location of individual pieces of equipment such that they are 150 feet from the nearest sensitive receptor or providing acoustical shielding of stationary ~~such~~ equipment when achieving 150 feet of separation is not feasible, use of temporary noise attenuation barriers, and/or other measures that are demonstrated to be sufficient to ensure ~~prior to issuance of grading and/or building permits~~that the maximum noise level at the property boundary would remain at or below 90 dB and increases in hourly noise levels at the property boundary would not exceed 10 dBA above the ambient noise level for two or more hours per day.

Additionally, City staff shall ensure that the Grading and Building Plans include the following notes:

A. Construction noise emanating from any construction activities for which a grading or building permit is required shall be prohibited on Sundays and federal holidays, and shall occur only as follows:
   - Monday through Friday, 7:00 a.m. to 7:00 p.m.
   - Saturday, 7:00 a.m. to 7:00 p.m.

B. All construction equipment shall be fitted with factory-installed muffling devices, and all construction equipment shall be maintained in good working condition to lower the likelihood of any piece of equipment emitting noise beyond the standard decibel level for that equipment.

C. All equipment and vehicles shall be turned off when not in use.

D. Unnecessary idling of internal combustion engines shall be prohibited.

E. Idling shall be limited to no more than 5 minutes.

9.5 REFERENCES CITED

Caltrans (California Department of Transportation). 1980. *Fundamentals and Abatement of Highway Traffic Noise.* September 1980.

Caltrans. 2013. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. September 2013. http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf.

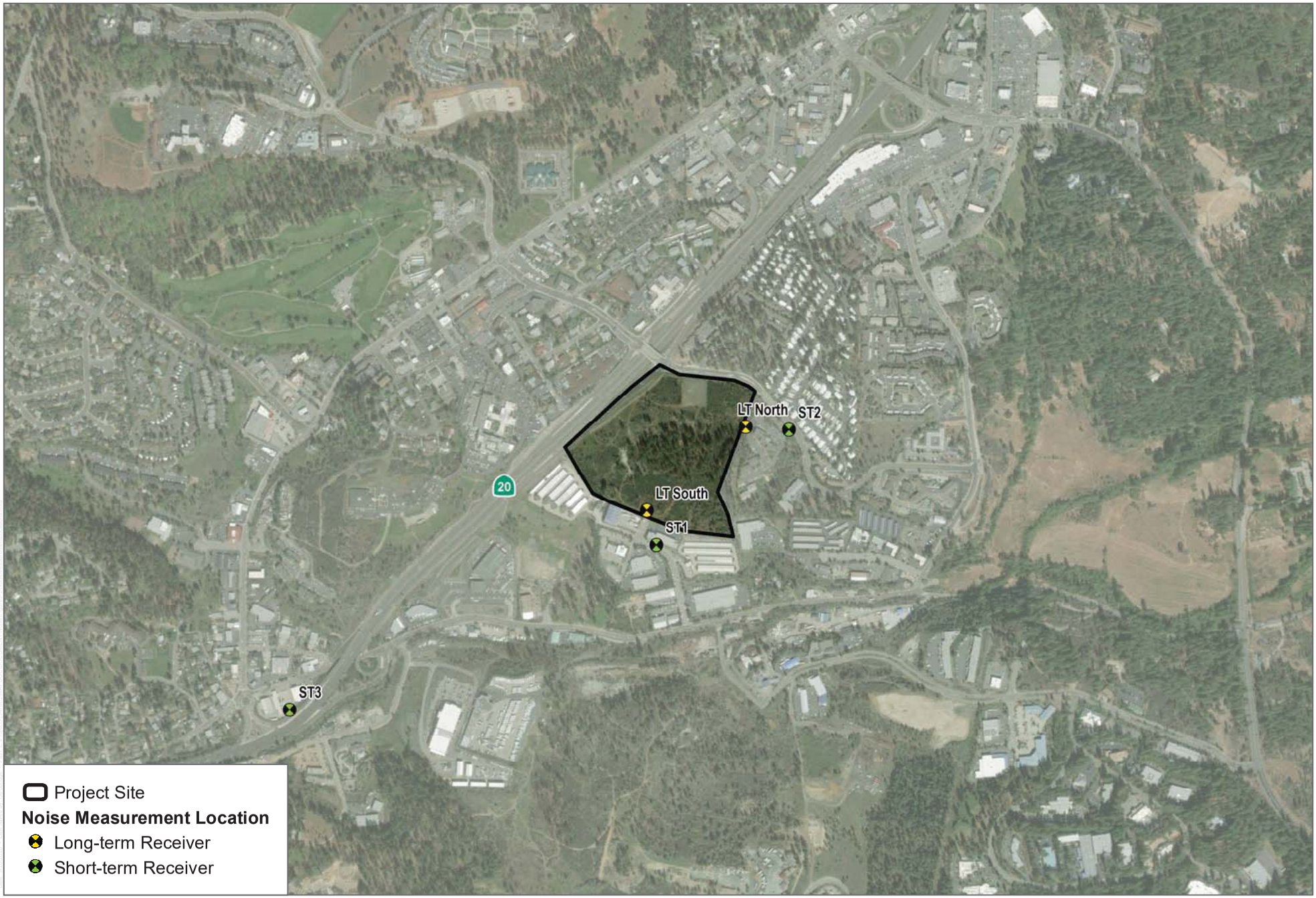
City of Grass Valley. 1999. *City of Grass Valley 2020 General Plan*. Adopted November 23, 1999.

City of Grass Valley. 2013. "Grass Valley Municipal Code Chapter 8.28 Noise." September 10, 2013. Accessed June 9, 2016. Available at https://www2.municode.com/library/ca/grass_valley/codes/code_of_ordinances?nodeId=TIT8HESA_CH8.28NO

DOT (U.S. Department of Transportation). 2006. FHWA Roadway Construction Noise Model: User's Guide. Final Report. FHWA-HEP-06-015. DOT-VNTSC-FHWA-06-02. Cambridge, Massachusetts: DOT, Research and Innovative Technology Administration. Final Report. August 2006.

FTA (Federal Transit Administration). 2006. *Transit Noise & Vibration Impact Assessment.* Federal Transit Administration, Office of Planning and Environment. May 2006.

TRB (Transportation Research Board). 2013. *Evaluating Pavement Strategies and Barriers for Noise Mitigation.* National Cooperative Highway Research Program Report 738.



SOURCE: Bing Maps 2018

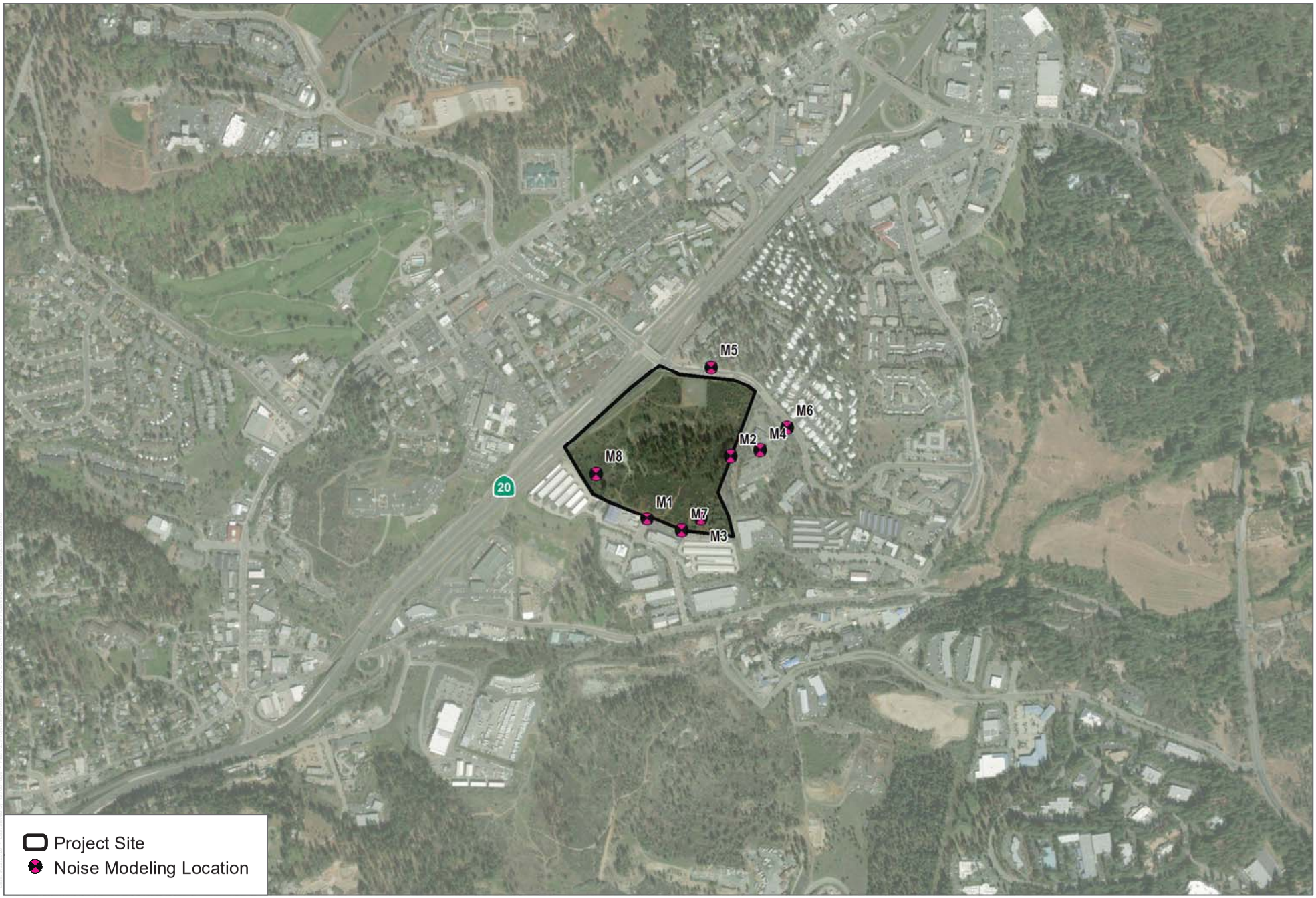
DUDEK

0 500 1,000 Feet

FIGURE 9-1

Noise Measurement Locations

Dorsey Marketplace EIR



SOURCE: Bing Maps 2018

DUDEK

0 500 1,000 Feet

FIGURE 9-2

Noise Modeling Locations

Dorsey Marketplace EIR

CHAPTER 10
AIR QUALITY

Development of the proposed Dorsey Marketplace (proposed project) under either the project alternatives is expected to generate air pollutant emissions during construction activities and occupancy of the project. Alternative A would provide for up to 90 apartment units, approximately 178,960 square feet of commercial space, and a 3,200-square-foot clubhouse. Alternative B would provide 172~~1~~ apartments, approximately 104,350 square feet of commercial space, approximately 8,500 square feet of office space, and a 3,200-square-foot clubhouse.

The portion of Nevada County where the proposed project is located is in a federal nonattainment area for ozone (O_3) and is designated as a nonattainment area for state O_3 and particulate matter with an aerodynamic diameter equal to or less than 10 microns (PM_{10}) standards. This section addresses project impacts under both Alternative A and Alternative B on air quality by analyzing the type and quantity of emissions that would be generated by the development of the proposed project.

Information referenced to prepare this section includes:

- *City of Grass Valley 2020 General Plan* (City of Grass Valley 1999a)
- *City of Grass Valley General Plan Update Environmental Impact Report* (City of Grass Valley 1999b)
- *Grass Valley General Plan Background Report* (Quad Knopf 1998)
- California Emissions Estimator Model (CalEEMod) (Appendix I)

One comment from the Wolf Creek Community Alliance was received in response to the Notice of Preparation regarding air quality and carbon sequestration that would be lost from removal of existing vegetation. The Notice of Preparation and letters received in response to it are included in Appendix A.

10.1 ENVIRONMENTAL SETTING

Ambient air quality is generally affected by climatological conditions, the topography of the air basin, and the type and amounts of pollutants emitted. The project site is located within the Mountain Counties Air Basin (MCAB). The MCAB includes portions of Amador, Calaveras, El Dorado, Mariposa, Nevada, Placer, Plumas, Sierra, and Tuolumne counties and is comprised of seven air districts. Nevada, Plumas, and Sierra counties are part of the Northern Sierra Air Quality Management District (NSAQMD). This section describes relevant characteristics of the air basin, types of air pollutants, health effects, and existing air quality levels.

Climate and Topography

Mild, wet winters and hot, dry summers characterize the climate of central and western Nevada County. Precipitation generally occurs between November and April. Prevailing winds are from the south and southwest, and local air quality is influenced by the transportation of emissions from upwind mobile and stationary pollution sources in Placer County, the Sacramento metropolitan area, and the San Francisco Bay area.

Air quality in western Nevada County is also affected by inversion layers, which occur when a layer of warm air traps a layer of cold air beneath it, preventing vertical dispersion of air contaminants. Calm atmospheric conditions that contribute to the creation of these inversion layers frequently occur in the region during late fall and early spring. The presence of an inversion layer results in higher concentrations of pollutants near ground level.

Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include O_3, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), PM_{10}, particulate matter with an aerodynamic diameter equal to or less than 2.5 microns ($PM_{2.5}$), and lead. These pollutants, as well as toxic air contaminants (TACs), are discussed in the following text.[1] In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors, such as hydrocarbons and NO_x. These precursors are mainly NO_x and reactive organic gases (ROGs, also termed volatile organic compounds [VOCs]). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric ozone) and at the Earth's surface in the troposphere (ozone).

[1] The descriptions of each of the criteria air pollutants and associated health effects are based on the EPA's Criteria Air Pollutants (2016) and the CARB Glossary of Air Pollutant Terms (2016a).

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. These health problems are particularly acute in sensitive receptors such as the sick, the elderly, and young children.

Nitrogen Dioxide. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide, which is a colorless, odorless gas. NO_x plays a major role, together with ROG, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections.

Carbon Monoxide. CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions.

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

SO_2 is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. When combined with particulate matter, SO_2 can

injure lung tissue and reduce visibility and the level of sunlight. SO_2 can also yellow plant leaves and erode iron and steel.

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Fine particulate matter ($PM_{2.5}$) is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides (SO_x), NO_x, and VOCs. Coarse particulate matter (PM_{10}) is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also damage and discolor surfaces on which they settle and produce haze and reduce regional visibility.

People with influenza, people with chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death as a result of breathing particulate matter. People with bronchitis can expect aggravated symptoms from breathing in particulate matter. Children may experience a decline in lung function due to breathing in PM_{10} and $PM_{2.5}$. Other groups considered sensitive are smokers, people who cannot breathe well through their noses, and exercising athletes (because many breathe through their mouths).

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phase-out of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phase-out of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead.

Volatile Organic Compounds. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as ROG (also referred to as volatile organic compounds). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of ROG result from the formation of O_3 and its related health effects. High levels of ROG in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for ROG as a group.

Toxic Air Contaminants

A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic non-cancer health effects. A toxic substance released into the air is considered a TAC. TACs are identified by federal and state agencies based on a review of available scientific evidence. In the State of California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics "Hot Spots" Information and Assessment Act, Assembly Bill (AB) 2588, was enacted by the legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources, such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources, such as automobiles; and area sources, such as landfills. Adverse health effects associated with exposure to TACs may include

carcinogenic (i.e., cancer-causing) and non-carcinogenic effects. Non-carcinogenic effects typically affect one or more target organ systems and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC.

Naturally occurring asbestos is found in some areas throughout California, most commonly where ultramafic rock or serpentinite rock is present. Another form of asbestos, known as tremolite, can be found associated with ultramafic rock, particularly near faults. When construction activities occur in areas with naturally occurring asbestos in the soils or rock, the asbestos can become airborne and may be inhaled. The project site is known to contain serpentine rock from the mafic and ultramafic era. In the Sierra Nevada foothills area, ultramafic rock and serpentinite are associated with naturally occurring asbestos (NOA) minerals such as chrysotile, actinolite, and tremolite. Materials containing NOA can become a public health hazard if the rock is broken and the asbestos fibers or dust become airborne.

Local Ambient Air Quality

CARB, air districts, and other agencies monitor ambient air quality at approximately 250 air quality monitoring stations across the state. Air quality monitoring stations usually measure pollutant concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. The most recent background ambient air quality data from 2015 to 2017 in Grass Valley are presented in Table 10-1. The air quality monitoring station is located at 200 Litton Drive, Suite 230, Grass Valley, California, 95945, located approximately 0.75 miles northwest of the project site. The data collected at this station are considered representative of the air quality experienced in the project vicinity. Air quality data and the number of days exceeding the ambient air quality standards for O_3 and $PM_{2.5}$, the pollutants monitored at the Grass Valley station, are provided in Table 10-1.

Table 10-1
Local Ambient Air Quality Data – Grass Valley, Litton Building Monitoring Station

Concentration or Exceedances	Ambient Air Quality Standard	2015	2016	2017
Ozone (O_3)				
Maximum 1-hour concentration (ppm)	0.09 ppm (state)	0.101	0.101	0.108
Number of days exceeding state standard (days)		*4*	*6*	*13*
Maximum 8-hour concentration (ppm)	0.070 ppm (state)	0.093	0.097	0.099
	0.070 ppm (federal)	0.092	0.097	0.099
Number of days exceeding state standard (days)		*30*	*46*	*85*
Number of days exceeding federal standard (days)		*26*	*39*	*78*
Fine Particulate Matter ($PM_{2.5}$)				
Maximum 24-hour concentration (μg/m³)	35 μg/m³ (federal)	11.5	11.7	68.1
Number of days exceeding federal standard (days) [a]		*0 (0)*	*0 (0)*	*3.0 (1)*
	12 μg/m³ (state)	130.0	19.5	75.4

Table 10-1
Local Ambient Air Quality Data – Grass Valley, Litton Building Monitoring Station

Concentration or Exceedances	Ambient Air Quality Standard	2015	2016	2017
Annual concentration (μg/m^3)	12.0 μg/m^3 (federal)	4.5	4.6	4.9

Sources: CARB 2018.
Notes: μg/m3 = micrograms per cubic meter; ppm = parts per million.
Data taken from California Air Resources Board (CARB) iADAM (http://www.arb.ca.gov/adam) represent the highest concentrations experienced over a given year.
Daily exceedances for particulate matter are estimated days because $PM_{2.5}$ is not monitored daily. There is no federal standard for 1-hour O_3, nor is there a state 24-hour standard for $PM_{2.5}$.
Grass Valley – Litton Building Monitoring Station is located at 200 Litton Drive, Suite 230, Grass Valley, California, 95945.
[a] Measurements of $PM_{2.5}$ are usually collected every 1 to 3 days. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air pollution-sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005). To the north of this and east of the project site, separated by open space, are the Grass Valley Terrace Apartments. To the north of the proposed project, on the other side of Dorsey Drive, are the Springhill Garden Apartments. Additionally, across State Route 20/49 there are sensitive populations in the Golden Empire Nursing and Rehab Center and the Sierra Nevada Memorial Hospital.

10.2 REGULATORY FRAMEWORK

Federal Regulations

Clean Air Act

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The U.S. Environmental Protection Agency (EPA) is responsible for implementing most aspects of the Clean Air Act, including setting National Ambient Air Quality Standards (NAAQS) for major air pollutants; setting hazardous air pollutant (HAP) standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric O_3 protection measures, and enforcement provisions. Under the

Clean Air Act, NAAQS are established for the following criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O_3, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

Hazardous Air Pollutants

The 1977 federal Clean Air Act amendments required the EPA to identify National Emission Standards for Hazardous Air Pollutants to protect public health and welfare. Hazardous air pollutants (HAPs) include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 federal Clean Air Act Amendments, which expanded the control program for HAPs, 189 substances and chemical families were identified as HAPs.

State Regulations

California Environmental Protection Agency (Cal/EPA) Air Resources Board Regulation 93105, *Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations* (ATCM), specifies how to handle disturbance of soil and rock that contain ultramafic rock, serpentinite or NOA minerals. Please refer to Section 15.2 in Chapter 15: Hazards and Hazardous Materials for a more detailed description on the States Asbestos Regulations.

California Ambient Air Quality Standards

The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products.

CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. An ambient air quality standard (AAQS) defines the maximum amount of a pollutant averaged over a specified period of time that can be present in outdoor air without harm to the public's health. The CAAQS describe adverse conditions; that is, pollution levels must be below these standards before a basin can attain the standard. Air quality is considered "in attainment" if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and $PM_{2.5}$ and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. Nevada County is designated by the EPA as a nonattainment area for the federal 8-hour ozone standard and CARB has designated the County as a nonattainment area for the state ozone, and PM_{10}. The County is designated as unclassified or attainment for all other criteria air pollutants. The NAAQS and CAAQS are presented in Table 10-2.

Table 10-2
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary*[c,d]	*Secondary*[c,e]
O_3	1 hour	0.09 ppm (180 μg/m³)	—	Same as Primary Standard[f]
	8 hours	0.070 ppm (137 μg/m³)	0.070 ppm (137 μg/m³)[f]	
NO_2[g]	1 hour	0.18 ppm (339 μg/m³)	0.100 ppm (188 μg/m³)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 μg/m³)	0.053 ppm (100 μg/m³)	
CO	1 hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	None
	8 hours	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	
SO_2[h]	1 hour	0.25 ppm (655 μg/m³)	0.075 ppm (196 μg/m³)	—
	3 hours	—	—	0.5 ppm (1,300 μg/m³)
	24 hours	0.04 ppm (105 μg/m³)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}[i]	24 hours	50 μg/m³	150 μg/m³	Same as Primary Standard
	Annual Arithmetic Mean	20 μg/m³	—	
$PM_{2.5}$[i]	24 hours	—	35 μg/m³	Same as Primary Standard
	Annual Arithmetic Mean	12 μg/m³	12.0 μg/m³	15.0 μg/m³
Lead[j,k]	30-day Average	1.5 μg/m³	—	—
	Calendar Quarter	—	1.5 μg/m³ (for certain areas)[k]	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 μg/m³	

Table 10-2
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary*[c,d]	*Secondary*[c,e]
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m^3)	—	—
Vinyl chloride[j]	24 hours	0.01 ppm (26 µg/m^3)	—	—
Sulfates	24 hours	25 µg/m^3	—	—
Visibility reducing particles	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to the number of particles when the relative humidity is less than 70%	—	—

Source: CARB 2016.

Notes: µg/m^3 = micrograms per cubic meter; CO = carbon monoxide; mg/m^3= milligrams per cubic meter; NO_2 = nitrogen dioxide; O_3 = ozone; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns; ppm = parts per million by volume; SO_2 = sulfur dioxide.

a California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, suspended particulate matter (PM_{10}, $PM_{2.5}$), and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once per year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration greater 150 µg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

d National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

e National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

f On October 1, 2015, the EPA Administrator signed the notice for the final rule to revise the primary and secondary NAAQS for O_3. The EPA is revising the levels of both standards from 0.075 ppm to 0.070 ppm and retaining their indicators (O_3), forms (fourth-highest daily maximum, averaged across 3 consecutive years) and averaging times (8 hours). The EPA is in the process of submitting the rule for publication in the Federal Register. The final rule will be effective 60 days after the date of publication in the Federal Register. The lowered national 8-hour standards are reflected in the table.

g To attain the national 1-hour standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards, the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

h On June 2, 2010, a new 1-hour SO_2 standard was established, and the existing 24-hour and annual primary standards were revoked. To attain the national 1-hour standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

i On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 were also retained. The form of the annual primary and secondary standards is the annual mean averaged over 3 years.

j CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

k The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated

nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

Toxic Air Contaminants

The state Air Toxics Program was established in 1983 under AB 1807 (Tanner). The California TAC list identifies more than 700 pollutants, of which carcinogenic and non-carcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the (federal) HAPs. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not regulate air toxics emissions. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

CARB approved a comprehensive Diesel Risk Reduction Plan in 2000 to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines. The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 as compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment program. All of these regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel powered equipment. Several Airborne Toxic Control Measures that reduce diesel emissions including In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.) and In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025). Despite these reduction efforts, CARB recommends that proximity to sources of diesel particulate matter (DPM) emissions be considered in the sitting of new sensitive land uses. The *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB 2005) is intended to give guidance to local governments in the sitting of sensitive land uses near sources of air pollution. Specifically, this document focuses on risks from emissions of DPM and establishes recommended sitting distances of sensitive receptors.

Sierra Club v County of Fresno

The California Supreme Court's *Sierra Club v. County of Fresno* decision (referred to herein as the Friant Ranch decision) (issued on December 24, 2018) addresses the need to correlate mass emission values for criteria air pollutants to specific health consequences, and contains the following direction from the California Supreme Court: "The EIR must provide an adequate analysis to inform the public how its bare numbers translate to create potential adverse impacts or it must explain what the agency does know and why, given existing scientific constraints, it cannot translate potential health impacts further." (Sierra Club v. County of Fresno 2018.)

Local Regulations

Northern Sierra Air Quality Management District

The NSAQMD is the primary agency responsible for planning to meet federal and state ambient air quality standards in Nevada, Plumas and Sierra counties. The NSAQMD develops rules and regulations for stationary sources and equipment, prepares emissions inventories and air quality management planning documents, and conducts source testing and inspections. NSAQMD rules and regulations applicable to the proposed project include the following:

Rule 205 Nuisance: This rule prohibits discharge of air contaminants or other material from any source which cause injury, detriment, nuisance or annoyance to any considerable number of persons, or to the public, or which endanger the comfort, repose, health or safety of any such persons, or the public, or which cause to have natural tendency to cause injury or damage to business or property.

Rule 207 Particulate Matter: This rule prohibits the release or discharge of particulate matter emissions in excess of 0.1 grains per cubic foot of dry exhaust gas as standards conditions into the atmosphere from any source or single processing unit, exclusive of sources emitting combustion contaminants only.

Rule 226 Dust Control: This rule requires the submittal of a Dust Control Plan to the NSAQMD for approval prior to any surface disturbance, including clearing of vegetation.

Rule 227 Cutback and Emulsified Asphalt Paving Materials: This rule restricts the discharge of VOCs caused by the use or manufacture of Cutback or Emulsified asphalts for paving, road construction or road maintenance, unless such manufacture or use complies with the provisions of the rule.

Rule 904 Asbestos Airborne Toxic Control Measure Asbestos-Containing-Serpentine: This rule incorporates by reference Title 17, Section 93106, of the California Code of Regulations in its entirety.

Grass Valley General Plan

The Land Use (LU) element, Circulation (C) element, and Conservation and Open Space (COS) element contain goals (G), objectives (O), policies (P) and implementation measures (I) to reduce emissions and improve air quality. Most of these goals, objectives, policies and implementation measures focus on promoting infill development, mixed use developments, and alternative means of transportation to reduce the amount of vehicles on the road and the distance required to access goods and services. The following goals, objectives, policies and implementation measures are applicable to the proposed project:

2-LUG: Promote infill as an alternative to peripheral expansion where feasible.

3-LUG: In areas of new development, plan for diversity of land uses and housing types, including mixed use developments.

6-LUG: Promote a jobs/housing balance within the Grass Valley region in order to facilitate pleasant, convenient and enjoyable working conditions for residents, including opportunities for short home to work journeys.

4-LUO: Reduction in environmental impacts associated with peripheral growth.

15-LUO: Reduction in the number of vehicle miles driven.

5-LUP: Actively market infill and available parcels during contracts with developers and community members.

6-LUP: Develop a more specific development strategy for identified infill parcels following General Plan adoption.

7-LUP: Utilize California Redevelopment Law to provide incentives to infill development.

8-LUP: Encourage and facilitate mixed-use developments on infill sites.

9-LUP: Provide for higher residential densities on infill site and in the Downtown area.

23-LUP: Encourage mixed use developments incorporating a variety of densities on infill sites and in areas proposed for annexation.

1-CG: Provide a circulation system that utilizes a variety of transportation modes, including alternative means of transportation.

2-CG: Ensure that streets and roadway improvements complement and support land use goals, objectives, policies, and plans.

5-CO: Convenient, safe and functional facilities for pedestrians, bicyclists and equestrians.

6-CP: Locate transit stops and park and ride facilities near freeway interchanges and in conjunction with higher density residential and mixed-use developments.

8-CP: Incorporate separated, non-motorized paths in street cross-section designs whenever feasible.

6-COSG: Assure compliance with and understanding of air and water quality regulations and standards.

16-COSO: Inclusion of air and water quality considerations in land use decisions rendered by the Planning Commission and City Council.

22-COSP: Implement circulation/transportation measures designed to reduce reliance on the automobile.

10.3 IMPACTS

Methods of Analysis

This section identifies and discusses the environmental impacts resulting from the proposed project and suggests mitigation measures to reduce the level of impact. A detailed discussion of mitigation measures is also included in this section.

Development of the proposed project could potentially be detrimental to air quality during both construction and operation phases. Construction activities would result in criteria pollutant emissions from site grading activities, construction of infrastructure, application of architectural coatings, and vehicle and construction equipment exhaust. Proposed project operation would result in criteria pollutant emissions primarily from vehicular sources; however, landscape maintenance equipment, heating sources (e.g., natural gas heaters) and other miscellaneous activities would also generate pollutant emissions. The CalEEMod land use and emissions modeling program was used to estimate air pollutant emissions that would be generated during construction and operation of the proposed project.

Significance Criteria

Based on the guidance in Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), the project would have a significant impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan?
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed the quantitative thresholds for ozone precursors).
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

In addition, Appendix G of the CEQA Guidelines indicates that where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to determine whether the proposed project would have a significant impact on air quality. The NSAQMD has developed a tiered approach to significance levels; a project with emissions qualifying it for Level A thresholds should require the most basic mitigations. Projects

which qualify for Level B should require more extensive mitigations, and subsequently, those projects which qualify for Level C should require the most extensive application of mitigations. The tiered thresholds for Levels A, B, and C are given in Table 10-3 for a project's estimated emissions of criteria pollutants in pounds per day. The emissions-based thresholds for O_3 precursors are intended to serve as a surrogate for an "O_3 significance threshold" (i.e., the potential for adverse O_3 impacts to occur). This approach is used because O_3 is not emitted directly (see the discussion of O_3 and its sources in Section 10.1) and the effects of an individual project's emissions of O_3 precursors (ROG and NO_x) on O_3 levels in ambient air cannot be determined through air quality models or other quantitative methods.

Table 10-3
Northern Sierra Air Quality Management District Emission Significance Thresholds

Threshold Level	ROG	NO_x	PM_{10}
	Pounds per Day		
Level A Thresholds	<24	<24	<79
Level B Thresholds	24–136	24–136	79–136
Level C Thresholds	>136	>136	>136

Notes: ROG = reactive organic gas; NO_x = oxides of nitrogen; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns.
Source: NSAQMD 2016.

If emissions for NO_x, ROG, and/or PM_{10} exceed 136 pounds per day (Level C), then there is a significant impact; below Level C the impact would be potentially significant. The NSAQMD guidelines suggest that projects with higher emissions (Level C Thresholds) should automatically mitigate more emissions, quantitatively, than would a lower impact project (Level A). Also according to the guidelines, if a new project is unable to provide adequate on-site mitigation of their long-term air quality impacts, an off-site mitigation program may be necessary.

The NSAQMD established their thresholds of significance for CEQA purposes in order to achieve and maintain the NAAQS and CAAQS. Since an AAQS is based on maximum pollutant levels in outdoor air that would not harm the public's health, and air district thresholds pertain to attainment of the AAQS, this means that a project that complies with the thresholds established by a local air district, such as the NSAQMD, would not result in adverse effects to human health.

Impact Analysis

Impact 10-1: Would the project conflict with or obstruct implementation of the applicable air quality plan?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Western Nevada County, which includes the project area, is designated nonattainment for the federal and state O_3 standards. The County is also nonattainment for the state PM_{10} standard. As a nonattainment area, the NSAQMD prepared the *Reasonably Available Control Technology (RACT) State Implementation Plan (SIP) for Western Nevada County 8-Hour Ozone Non-Attainment Area*, which is a federally enforceable air quality attainment plan for western Nevada County designed to reduce emissions of O_3 precursors (ROG and NO_x) to attain the federal ozone standard by the earliest practicable date, in accordance with the Clean Air Act.

If a project proposes development that is greater than that anticipated in the local plan's growth projections, the project might be in conflict with the SIP and may contribute to a potentially significant cumulative impact on air quality.

Alternative A

Under Alternative A the project proposes to construct 90 units (20 one bedroom, 50 two bedroom, and 20 three bedroom). Based on the average household size of 2.04, the proposed project would add approximately 184 people to the City. According to the City's Housing Element, the population of Grass Valley increased by approximately 15% between 2000 and 2010, with an average annual growth rate of 1.5%. In 2010, the U.S. Census documented the population Grass Valley as 12,860, which rose to 13,041 by 2018 (Department of Finance 2018). Implementation of the project would result in a total population of 13,225, a 1.41% increase over the 2018 population. Population growth since 2012 has been flat, with some years showing a slight (fewer than 30 people) increase and some years showing a slight decrease. Thus, to project population in the year 2020 (the year in which the project is assumed to be fully built out), the average annual growth rate identified in the Housing Element for the period between 2000 and 2010 was used. Thus, the City is estimated to have a population of 13,431 in 2020 without construction of Alternative A and 13,615 with construction of this alternative. Alternative A would represent the equivalent of a single year of population growth. Given the flat population growth since 2012, this slight increase in growth would not result in the City exceeding historic average growth rate or reaching a total population that is greater than the estimated population range in the City's General Plan, including the Housing Element. Thus, the project would not result in regional growth that is not accounted for within the SIP and as such, would not conflict with the projected emission trends provided in the SIP. Therefore, under Alternative A the project would be consistent at a regional level with the air quality attainment plan. Impacts would be less than significant.

Alternative B

Alternative B proposes to construct 172~~1~~ units (38 one bedroom, 96~~5~~ two bedroom, and 38 three bedroom). Based on the average household size in the City of 2.04 people (City of Grass Valley 2014), Alternative B would add approximately ~~349~~ 351 people to the City.

Based on the year 2018 population of 13,041 people (Department of Finance 2018), construction of Alternative B would raise the City's population to 13,390 people if it were fully built out immediately. This would be a 2.7% increase compared to the existing population. With the assumed population in 2020 of 13,431 in 2020 without construction of Alternative B, this alternative would lead to a total city-wide population of 13,780. Given the relatively flat population growth in the City since 2012, this slight increase in growth would not result in the City exceeding historic average growth rate or reaching a total population that is greater than the estimated population range in the City's General Plan, including the Housing Element. The population increase of approximately 2.7% does not represent a substantial increase and would not result in regional growth that is not accounted for within the SIP. As such, this impact would be less than significant because the growth accommodated by the proposed project under Alternative B would not conflict with the projected emission trends provided in the SIP and the project would be consistent at a regional level with the air quality attainment plan.

Impact 10-2: Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation Measures 10a and 10b	Mitigation Measures 10a and 10b
Significance after mitigation:	Less than significant	Less than significant

Alternative A

Construction

Construction of the project would result in a temporary addition of pollutants to the local airshed caused by soil disturbance, fugitive dust emissions, and combustion pollutants from on-site construction equipment, as well as from off-site trucks hauling construction materials. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Fugitive dust (PM_{10} and $PM_{2.5}$) emissions would primarily result from grading and site preparation activities. NO_x and CO emissions would primarily result from the use of construction equipment and motor vehicles.

Emissions from the construction of the proposed project were estimated using CalEEMod. Specific construction schedule sequencing and subphases for the proposed project have not yet been determined; therefore, a conceptual construction schedule was developed for the purpose of air quality modeling as shown in Table 10-4.

Table 10-4
Construction Schedule

Phase Type	Start Date	End Date	Number of Days/Week	Total Days
Site Preparation	07/01/2019	2019/07/12	5	10
Grading/Utilities	07/13/2019	2019/12/20	5	115
Laying Rock Base	12/21/2019	2020/01/17	5	20
Paving	01/18/2020	2020/01/31	5	10
Building Construction (Non-Residential)	02/01/2020	2020/08/04	5	132
Architectural Coating (Non-Residential)	06/01/2020	2020/08/04	5	47
Building Construction (Residential)	08/05/2020	2021/02/04	5	132
Architectural Coating (Residential)	12/01/2020	2021/02/04	5	48

Source: Appendix I.

Table 10-5 presents the general construction equipment mix used for the air pollutant emissions modeling of the proposed project. The equipment mix was generally followed for all construction modeling scenarios. For this analysis, it was assumed that heavy construction equipment would be operating at the site for approximately 8 hours a day (or less), 5 days a week (22 days per month), during project construction. However, the construction phases, construction equipment, and equipment hours of operation varied depending on the project component. Default construction worker, vendor trips, and trip lengths as provided in CalEEMod were used with the exception of the trips necessary to remove excavated soil from the site. The modeling inputs reflect an assumption that 300 one-way trips for soil off-haul would occur during the grading phase. Specific CalEEMod assumptions for each model scenario, including quantity of equipment, are provided in Appendix I.

Table 10-5
Construction Scenario Assumptions

Construction Phase	Average Daily Worker One-Way Trips	Average Daily Vendor One-Way Trips	Total Haul Truck One-Way Trips	Equipment	Quantity
Site Preparation	18	0	0	Rubber-Tired Dozers	3
				Tractors/Loaders/Backhoes	4
Grading/Utilities	24	0	300	Excavators	2
				Graders	1
				Rubber-Tired Dozers	1
				Scrapers	2
				Tractors/Loaders/Backhoes	2
				Trenchers	1
Laying Rock Base	18	0	0	Rubber-Tired Dozers	3
				Tractors/Loaders/Backhoes	4

Table 10-5
Construction Scenario Assumptions

Construction Phase	Average Daily Worker One-Way Trips	Average Daily Vendor One-Way Trips	Total Haul Truck One-Way Trips	Equipment	Quantity
Paving	16	0	0	Pavers	2
				Paving Equipment	2
				Rollers	2
Building construction (Non-Residential)	216	92	0	Cranes	1
				Forklifts	3
				Generator Sets	1
				Tractors/Loaders/Backhoes	3
				Welders	1
Architectural coating (Non-Residential)	44	0	0	Air Compressors	1
Building construction (Residential)	66	0	0	Cranes	1
				Forklifts	3
				Generator Sets	1
				Tractors/Loaders/Backhoes	3
				Welders	1
Architectural coating (Residential)	14	0	0	Air Compressors	1

Source: Appendix I

Implementation of the proposed project would generate air pollutant emissions from entrained dust, off-road equipment, vehicle emissions, architectural coatings, and asphalt pavement application. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, primarily during the grading and site preparation phases, resulting in PM_{10} and $PM_{2.5}$ emissions. The proposed project is subject to NSAQMD Rule 226, Dust Control (NSAQMD 2016), which requires the submittal and approval of a Dust Suppression Control Plan to the NSAQMD prior to the disturbance of any topsoil. Compliance with Rule 226 would limit fugitive dust (PM_{10} and $PM_{2.5}$) that may be generated during grading and construction activities. To account for dust control measures in the calculations, it was assumed that the active sites would be watered at least two times daily, resulting in an approximately 55% reduction of particulate matter. Internal combustion engines used by construction equipment, vendor trucks (i.e., delivery trucks), and worker vehicles would result in emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$. Table 10-6 shows the estimated maximum daily construction emissions associated with the construction of Alternative A. Complete details of the emissions calculations are provided in Appendix I.

Table 10-6
Maximum Daily Construction Emissions – Alternative A

Year	ROG	NO_x	CO	SO_x	PM_{10}[a]	$PM_{2.5}$[a]
	Pounds per Day					
2019	5.4	59.5	37.9	<0.1	10.8	6.7
2020	56.6	42.6	38.6	<0.1	10.6	6.6
2021	37.8	20.6	23.3	<0.1	2.1	1.3
Maximum Daily Emissions	*56.6*	*59.5*	*38.6*	*<0.1*	*10.8*	*6.7*
NSAQMD Significance Threshold Level[b]	*Level B*	*Level B*	*NA*	*NA*	*Level A*	*NA*
Significant (Yes/No or Potentially)?[c]	Potentially	Potentially	No	No	Potentially	No

Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter with an aerodynamic diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; NSAQMD = Northern Sierra Air Quality Management District.

[a] A control efficiency of 55% was included when calculating the emissions of PM_{10} and $PM_{2.5}$ to account for the fugitive dust and particulate matter emission controls in Rule 226.

[b] The NSAQMD Threshold Levels are shown in Table 2.

[c] Significance is based on Table 2 thresholds. For Level A or B criteria, they are considered potentially significant. If the emissions exceed the Level C threshold, they are considered significant.

Source: Appendix I

As shown in Table 10-6, daily construction emissions of ROG, NO_x, and PM_{10} from development of Alternative A would be potentially significant (Level A or B) according to the NSAQMD significance criteria therefore mitigation is required. The NSAQMD does not have significance criteria for SO_2, CO, or $PM_{2.5}$. Mitigation Measure 1 has been included per the NSAQMD guidelines in order to reduce overall impacts during construction to a less-than-significant impact.

Operations

Operation of the project would produce ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from area sources, including natural gas combustion, use of consumer products, and motor vehicle trips to project land uses. The project would primarily impact air quality through vehicular traffic generated by residents, employees, and visitors. The estimation of proposed operational emissions was based on proposed land use defaults and total area (i.e., square footage) of buildings and residential dwelling units that would be in operation by 2022 (first year of operation).

Area Sources

CalEEMod was used to estimate operational emissions from area sources, which includes emissions from consumer product use, architectural coatings, and landscape maintenance equipment. Emissions associated with natural gas usage are calculated in the building energy use, which is described in the following energy source section.

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal

care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2017). Consumer product VOC emissions are estimated in CalEEMod for nonresidential land uses based on the floor area of buildings and the default factor of pounds of VOC emissions per building square foot per day.

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings such as in paints and primers using during building maintenance. CalEEMod calculates the VOC evaporative emissions from application of surface coatings based on the VOC emission factor, building square footage, assumed fraction of surface area, and reapplication rate. The VOC emission factor is based on the VOC content of the surface coatings. Consistent with CalEEMod defaults, it is assumed that the surface area for painting equals 2.0 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating. For areas that include pavement, the architectural coating area is assumed to be 6% of the total square footage, consistent with the supporting CalEEMod studies provided as an appendix to the CalEEMod User's Guide (CAPCOA 2017). The model default reapplication rate of 10% of area per year is assumed. Consistent with typical construction practices, it is assumed that anticipated that interior paint would not exceed flat coating limit, 50 grams per liter (g/L) VOC and exterior paint would not exceed non-flat coating limits, 100 g/L VOC.

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers. The emissions associated with landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per square foot of building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days as a conservative measure. For Nevada County, the average annual summer days are estimated to be 180 days (CAPCOA 2017).

Energy Sources

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage (non-hearth). Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod since criteria pollutant emissions occur at the site of the power plant, which is typically off site. For the proposed project, the estimated energy use was based on CalEEMod default values. CalEEMod 2016.3.2 uses the 2016 version of Title 24 as a basis for energy modelling. The proposed project would be required to meet the most recent updates to the Title 24 standards.

Vehicle Traffic

CalEEMod was used to estimate daily emissions from proposed vehicular sources. CalEEMod default data, including temperature, trip characteristics, variable start information, emissions factors, and trip distances, were conservatively used for the model inputs. Project-related traffic was assumed to include a mixture of vehicles in accordance with the model outputs for traffic. Emission factors representing the vehicle mix and emissions for 2022 (the first full year of operation) were used to estimate emissions associated with full buildout of the proposed project.

Table 10-7 presents the maximum daily emissions associated with operation of Alternative A. The values shown are the maximum summer or winter daily emissions results from CalEEMod which are compared with the NSAQMD significance thresholds. Details of the emission calculations are provided in Appendix I.

Table 10-7
Maximum Daily Operational Criteria Air Pollutant Emissions – Alternative A

Source	ROG	NOx	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Area Sources	9.4	1.4	8.1	<0.1	0.2	0.2
Energy	0.1	0.6	0.4	<0.1	<0.1	<0.1
Motor Vehicles	23.4	103.0	185.7	0.4	24.7	6.9
Total Emissions	**32.9**	**105.0**	**194.2**	**0.4**	**24.9**	**7.1**
NSAQMD Significance Threshold Level[1]	*Level B*	*Level B*	*NA*	*NA*	*Level A*	*NA*
Significant (Yes/No or Potentially)?[2]	Potentially	Potentially	No	No	Potentially	No

Source: Appendix I.
Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter with an aerodynamic diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; NSAQMD = Northern Sierra Air Quality Management District.
1 The NSAQMD Threshold Levels are shown in Table 10-2.
2 Significance is based on Table 10-2 thresholds. For Level A or B criteria, they are considered potentially significant. If the emissions exceed the Level C threshold, they are considered significant.
These estimates reflect implementation of Rule 218, which limits the volatile organic compound (VOC) content of architectural coatings to 100 g/L.

As shown in Table 10-7, estimated operational emissions of ROG, NO_x, and PM_{10} would not exceed the NSAQMD's Level C significance threshold of 137 pounds per day during either the summer or winter months. However, emissions of ROG, NO_x, and PM_{10} are projected to exceed the NSAQMD's Level A significance threshold. According to NSAQMD guidance, emissions exceeding the Level A significance threshold would contribute to existing nonattainment conditions and may also interfere with the region's ability to maintain ambient air quality standards if no mitigation is implemented. This impact would be considered potentially significant and mitigation is required. Implementation of Mitigation Measure 10b would reduce operational

emissions under Alternative A to below the Level B threshold; this would reduce air quality impacts to a less-than-significant level.

Health Effects of Criteria Air Pollutants

Construction and operation of the proposed project would result in emissions that would exceed the NSAQMD Level A significance thresholds for ROG, NO_x, or PM_{10}. As previously discussed, the NSAQMD considers projects that would exceed the Level A significance thresholds to contribute to existing nonattainment conditions and may also interfere with the region's ability to maintain ambient air quality standards if no mitigation is implemented. ROG emissions would be associated with motor vehicles, construction equipment, and architectural coatings. However, implementation of Mitigation Measures 10a and 10b would reduce project-generated ROG emissions to a less-than-significant level. In addition, the VOCs in architectural coatings generally are of relatively low toxicity.

ROG and NO_x are precursors to O_3, for which the MCAB is designated as nonattainment with respect to the NAAQS and CAAQS. As discussed previously, the health effects associated with O_3 are generally associated with reduced lung function. The contribution of ROG and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the MCAB due to O_3 precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions to occur. However, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the ROG emissions would occur because exceedances of the O_3 NAAQS and CAAQS tend to occur between April and October when solar radiation is highest. The holistic effect of a single project's emissions of O_3 precursors is speculative due to the lack of quantitative methods to assess this impact. Thus, a project's ROG and NO_x emissions are evaluated in the context of the NSAQMD significance thresholds, which define the levels of emissions that can occur without causing or contributing to violations of the NAAQS and CAAQS. In turn, the NAAQS and CAAQS define the pollutant concentrations above which adverse health effects are expected to occur. ROG and NO_x emissions associated with proposed project construction and/or operation would exceed the NSAQMD Level A thresholds and would therefore require implementation of Mitigation Measures 10a and 10b. After implementation of mitigation, emissions would be below the Level A thresholds and thus it is not anticipated the proposed project would contribute to regional O_3 concentrations and the associated health effects.

Construction and operation of the proposed project would not contribute to exceedances of the NAAQS and CAAQS for NO_2. Health effects that result from NO_2 and NO_x include respiratory irritation, which could be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. However, off-road construction equipment would be operating at various portions of the project site and would not be concentrated in one portion of the site at

any one time. Construction and operation of the proposed project would not require use of any stationary sources (e.g., diesel generators, boilers) that would create substantial, localized NO_x impacts. Therefore, the proposed project is not anticipated to result in potential health effects associated with NO_2 and NO_x because the emissions would not create or contribute to a violation of the NAAQS or CAAQS, which define the concentration of NO_2 above which adverse health effects are expected.

Construction and operation of the proposed project would also not exceed NSAQMD Level A threshold for PM_{10} after implementation of mitigation and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter or obstruct the MCAB from coming into attainment for these pollutants. The proposed project would also not result in substantial DPM emissions during construction and operation, and therefore, would not result in significant health effects related to DPM exposure. Additionally, the proposed project would implement dust control strategies and be required to comply with NSAQMD Rule 226, which limits the amount of fugitive dust generated during construction. Therefore, it is not anticipated that the proposed project would result in potential health effects associated related to particulate matter because the project would not create concentrations of particulate matter that exceed the NAAQS or CAAQS.

Alternative B

Construction

Emissions associated with construction and operation of Alternative B were calculated using the CalEEMod version 2016.3.2. The construction model inputs are described in more detail under the Alternative A discussion of this impact criterion. In summary, the Alternative B was assumed to be constructed from 2019 through 2021, applying the same construction parameters provided in the previous Alternative A discussion with exception to the specific Alternative B land use quantities. CalEEMod was also used to estimate emissions resulting from buildout of Alternative B using the same assumptions described in the Alternative A discussion. The first full year after buildout of the proposed project was assumed to be 2022.

Table 10-8 shows the estimated maximum daily construction emissions associated with the construction of Alternative B. Complete details of the emissions calculations are provided in Appendix I.

Table 10-8
Maximum Daily Construction Emissions – Alternative B

Year	ROG	NO_x	CO	SO_x	PM_{10}[a]	$PM_{2.5}$[a]
	Pounds per Day					
2019	5.4	59.5	37.9	<0.1	10.8	6.7
2020	70.6	42.6	38.2	<0.1	10.6	6.6
2021	70.3	20.6	23.3	<0.1	2.1	1.3
Maximum Daily Emissions	*70.6*	*59.5*	*38.2*	*<0.1*	*10.8*	*6.7*
NSAQMD Significance Threshold Level[b]	*Level B*	*Level B*	*NA*	*NA*	*Level A*	*NA*
Significant (Yes/No or Potentially)?[c]	Potentially	Potentially	No	No	Potentially	No

Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter with an aerodynamic diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; NSAQMD = Northern Sierra Air Quality Management District.

[a] A control efficiency of 55% was included when calculating the emissions of PM_{10} and $PM_{2.5}$ to account for the fugitive dust and particulate matter emission controls in Rule 226.

[b] The NSAQMD Threshold Levels are shown in Table 2.

[c] Significance is based on Table 2 thresholds. For Level A or B criteria, they are considered potentially significant. If the emissions exceed the Level C threshold, they are considered significant.

Source: Appendix I

As shown in Table 10-8, daily construction emissions of ROG, NO_x, and PM_{10} from development of Alternative B would be potentially significant (Level A or B) according to the NSAQMD significance criteria therefore mitigation is required. The NSAQMD does not have significance criteria for SO_2, CO, or $PM_{2.5}$. Mitigation Measure 10a has been included per the NSAQMD guidelines in order to reduce overall impacts during construction to a less-than-significant impact.

Operation

Table 10-9 presents the maximum daily emissions associated with operation of Alternative A. The values shown are the maximum summer or winter daily emissions results from CalEEMod, which are compared with the NSAQMD significance thresholds. Details of the emission calculations are provided in Appendix I.

Table 10-9
Maximum Daily Operational Criteria Air Pollutant Emissions – Alternative B

Sources	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Area Sources	10.7	2.7	15.3	<0.1	0.3	0.3
Energy	0.1	0.7	0.4	<0.1	0.1	0.1
Motor Vehicles	25.0	111.0	201.1	0.4	27.4	7.6
Total Emissions	**35.8**	**1114.4**	**216.8**	**0.4**	**27.8**	**8.0**
NSAQMD Significance Threshold Level[1]	*Level B*	*Level B*	*NA*	*NA*	*Level A*	*NA*
Significant (Yes/No or Potentially)?[2]	Potentially	Potentially	No	No	Potentially	No

Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter with an aerodynamic diameter equal to or less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; NSAQMD = Northern Sierra Air Quality Management District.

1 The NSAQMD Threshold Levels are shown in Table 10-2.

2 Significance is based on Table 10-2 thresholds. For Level A or B criteria, they are considered potentially significant. If the emissions exceed the Level C threshold, they are considered significant.
These estimates reflect implementation of Rule 218, which limits the volatile organic compound (VOC) content of architectural coatings to 100 g/L.

Source: Appendix I

As shown in Table 10-9, estimated operational emissions of ROG, NO_x, and PM_{10} would not exceed the NSAQMD's Level C significance threshold of 137 pounds per day during either the summer or winter months. However, emissions of ROG, NO_x, and PM_{10} are projected to exceed the NSAQMD's Level A significance threshold. According to NSAQMD guidance, emissions exceeding the Level A significance threshold would contribute to existing nonattainment conditions and may also interfere with the region's ability to maintain ambient air quality standards if no mitigation is implemented. This impact would be considered potentially significant and mitigation is required. Implementation of Mitigation Measure 10b would reduce operational emissions under Alternative A to below the Level B threshold; this would reduce air quality impacts to a less-than-significant level.

Health Effects of Criteria Air Pollutants

Similar to the Alternative A analysis discussed previously within this impact criterion, implementation of Mitigation Measures 10a and 10b would ensure that air pollutant emissions during construction and operation of Alternative B would not exceed the NSAQMD Level C significance thresholds for the maximum allowable volume of ROG, NO_x, and PM_{10} emissions. Therefore, the proposed project is not anticipated to result in adverse health effects associated with the criteria pollutants of ROG, NO_x, and PM_{10} because it would not create concentrations of these pollutants that exceed the NAAQS or CAAQS.

Impact 10-3: Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project area is in nonattainment under an applicable federal or state ambient air quality standard (including the release of emissions that exceed quantitative thresholds for ozone precursors)?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

In analyzing cumulative impacts from the project, the analysis must specifically evaluate a project's contribution to the cumulative increase in pollutants for which the County is designated as nonattainment for the CAAQS and NAAQS. If the proposed project does not exceed thresholds and is determined to have less-than-significant project-specific impacts, it may still contribute to a significant cumulative impact on air quality if the emissions from the project, in combination with the emissions from other proposed or reasonably foreseeable future projects, are in excess of established thresholds. However, the proposed project would only be considered to have a significant cumulative impact if the project's contribution accounts for a significant proportion of the cumulative total emissions (i.e., it represents a "cumulatively considerable contribution" to the cumulative air quality impact).

Western Nevada County has been designated as a federal nonattainment area for O_3 and a state nonattainment area for O_3 and PM_{10}. PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the County. As discussed previously, the emissions of all criteria pollutants would be below the Level C significance thresholds. Construction would be short term and temporary in nature. Once construction is completed, construction-related emissions would cease. Any change in operational emissions associated with the proposed project would be negligible and would not result in a significant impact. Furthermore, implementation of Mitigation Measures 10a and 10b would reduce air quality impacts from construction and operations. As such, the proposed project would result in less-than-significant cumulative impacts to air quality relative to operational emissions.

As previously noted, the proposed project would not result in regional growth not accounted for within the SIP. Specifically, proposed project would not generate operational vehicle trips and would not conflict with the projected emission trends provided in the SIP. As a result, the proposed project would not result in a cumulatively considerable contribution to regional O_3 concentrations. Cumulative impacts would be less than significant.

Impact 10-4: Would the project expose sensitive receptors to substantial pollutant concentrations?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

The project would have the potential of resulting in localized impacts from emissions of pollutants identified by the state and federal government as TACs or HAPs, respectively, as well as CO hotspots.

Health Impacts of Toxic Air Contaminants

Construction of the proposed project would involve the use of diesel-fueled vehicles used during site preparation, grading, building construction, paving, and application of architectural coatings. DPM is the primary TAC of concern during these construction activities. Notably, on-road diesel trucks traveling to and from the proposed project would be less of a concern because they would not stay on the site for long durations. The following measures are required by state law to reduce diesel particulate emissions:

- Fleet owners of mobile construction equipment are subject to the CARB Regulation for In-use Off-road Diesel Vehicles (Title 13 California Code of Regulations, Chapter 9, Section 2449), the purpose of which is to reduce DPM and criteria pollutant emissions from in-use (existing) off-road diesel-fueled vehicles.
- All commercial diesel vehicles are subject to Title 13, Section 2485 of the California Code of Regulations, limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading and unloading shall be limited to five minutes; electric auxiliary power units should be used whenever possible.

According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 30-year exposure period for the maximally exposed individual resident; however, such assessments should be limited to the period/duration of activities associated with the project. Since the proposed project involves construction activities in several areas across the site, project would not require the extensive use of heavy-duty construction equipment or diesel trucks in any one location over the duration of development, which would limit the exposure of any proximate individual sensitive receptor to TACs. Further, the modeling of construction emissions demonstrates that particulate matter emissions would reach a maximum of 10.8 pounds per day of PM_{10} and 6.7 pounds per day of $PM_{2.5}$, as shown in Tables 10-6 and 10-8.

These levels are well-below the NSAQMD Level A threshold of 79 pounds per day. Due to the relatively short period of exposure at any individual sensitive receptor and minimal particulate emissions generated on site, TACs generated during construction would not be expected to result in concentrations causing significant health risks.

~~According to the NSAQMD, no naturally occurring asbestos (NOA) has been mapped in the project area. However,~~ A~~a~~s discussed in Chapter 15, Hazards and Hazardous Materials, the project site is known to contain NOA. A Removal Action Workplan (RAW) (Appendix J-3A) was approved by the California Department of Toxic Substances Control (DTSC). DTSC adopted a CEQA Notice of Exemption for implementation of the RAW (Appendix J-3B). The RAW incudes a Asbestos Dust Mitigation Plan, which outlines engineering controls that must be used on site to reduce the risk of release of metals and NOA fibers into the environment during site clearing, excavation, grading, underground utility work, transportation, and disposal activities. ~~if NOA is identified during earthwork, the NSAQMD must be notified no later than the following business day and compliance~~ Therefore, the project would comply with the statewide *Asbestos Toxic Control Measure for Construction, Grading, Quarrying and Surface Mining Operations* (Asbestos ATCM) would be required. The implementation of the RAW is required under Mitigation Measure 10a. ~~Also, in regards to surfacing materials, the project is required to comply with the statewide *Asbestos Airborne Toxic Control Measure for Surfacing Applications* (Surfacing ATCM), which prohibits the use of material containing 0.25% asbestos or greater for surfacing of areas such as trails, pedestrian walkways, and roads.~~

Health Impacts of Carbon Monoxide

The primary mobile-source criteria pollutant of local concern is CO. As noted previously, Nevada County is currently designated attainment for both state and national CO ambient air quality standards, and the County typically experiences low background CO concentrations.

To verify that the project would not cause or contribute to a violation of the CO standard, a screening evaluation of the potential for CO hotspots was conducted. The transportation impact analysis report (Appendix G) evaluated whether there would be a decrease in the level of service (LOS) (i.e., increased congestion) at the intersections affected by the proposed project. The potential for CO hotspots was evaluated based on the results of the traffic impact analysis. The California Department of Transportation (Caltrans) Institute of Transportation Studies *Transportation Project-Level Carbon Monoxide Protocol* (CO Protocol) (Caltrans 1997) was followed.

In accordance with the CO Protocol, CO hotspots are typically evaluated when (1) the LOS of an intersection or roadway decreases to LOS E or worse; (2) signalization and/or channelization is added to an intersection; and (3) sensitive receptors such as residences, schools, and hospitals are located in the vicinity of the affected intersection or roadway segment.

The proposed project's transportation impact analysis evaluated 18 intersections and 14 roadway segments. As determined by the transportation impact analysis, all intersections would operate at acceptable LOS during the AM and PM peak hours with implementation of project-related improvements (Appendix G). Therefore, the proposed project would not negatively affect the LOS of intersections in the project area and would not significantly contribute to a CO hotspot.

Impact 10-5: Would the project create objectionable odors affecting a substantial number of people?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

The occurrence and severity of potential odor impacts depends on numerous factors. The nature, frequency, and intensity of the source; the wind speeds and direction; and the sensitivity of receiving location each contribute to the intensity of the impact. Although offensive odors seldom cause physical harm, they can be annoying and cause distress among the public and generate citizen complaints.

Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application. In general, odors are highest near the source, but disperse quickly resulting in a reduced off-site exposure. Sensitive receptors located proximate to the proposed construction sites may be affected. However, construction of the proposed project would use typical construction techniques in compliance with NSAQMD rules and any odors associated with proposed project construction activities would be temporary and would cease upon completion of construction. Therefore, impacts associated with odors during construction would be less than significant.

In regards to operations, the proposed project does not include not land uses typically associated with the generation of objectionable odors. Odors generated from operation of the proposed project would consist of vehicle exhaust generated by residents and employees or customers traveling to and from the project site, through the periodic use of landscaping or maintenance equipment and from the temporary storage of typical solid waste (refuse) associated with the project's (long-term operational) uses; however, these odors are not considered objectionable odors that would affect a substantial number of people. It is expected that project-generated refuse would be stored in covered containers and removed at regular intervals in compliance with the City's solid waste regulations. Therefore, impacts associated with odors generated from operations would be less than significant.

10.4 MITIGATION MEASURES

Mitigation Measure 10a: Prior to issuance of grading permits, the City of Grass Valley shall verify that construction contracts include requirements for construction contractor(s) to implement the following measures:

- Alternatives to open burning of vegetative material will be used unless otherwise deemed infeasible by the NSAQMD. Among suitable alternatives are chipping, mulching, or conversion to biomass fuel.
- Fugitive dust shall be controlled as required by District Rules
- All exposed surfaces shall be watered two times daily. Exposed surfaces include, but are not limited to soil piles, graded areas, unpaved parking areas, staging areas, and access roads.
- Haul trucks transporting soil, sand, or other loose material on the site must be loaded with a minimum of two feet of freeboard. Any haul trucks that would be traveling along freeways or major roadways shall be covered.
- Wet power vacuum street sweepers shall be used to remove any visible trackout mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited.
- Vehicle speeds on unpaved roads shall be limited to 15 miles per hour.
- All roadways, driveways, sidewalks, parking lots to be paved shall be completed as soon as possible. In addition, building pads shall be laid within 4 months of grading unless seeding or soil binders are used.
- Grid power shall be used (as opposed to diesel generators) for job site power needs where feasible during construction.
- No equipment or vehicles may idle for more than 5 minutes. Clear signage that posts this requirement for workers shall be posted at the entrances to the site.
- The construction contractor shall provide the City with current certificate(s) of compliance for CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation [California Code of Regulations, Title 13, sections 2449 and 2449.1].

- Temporary traffic control shall be provided during all phases of the construction to improve traffic flow as deemed appropriate by local transportation agencies and/or Caltrans.
- Construction activities shall be scheduled to direct traffic flow to off-peak hours as much as practicable.
- Minimize active earthmoving and the generation of fugitive dust to the extent feasible when pedestrians walk by active project construction sites.
- The project applicant shall implement the Removal Action Workplan (RAW) as approved by the California Department of Toxic Substances Control prior to construction of the proposed project. Throughout all activities conducted in implementation of the RAW, contractors must adhere to each component of the RAW, including, but not limited to the Site Safety Plan and the Asbestos Dust Mitigation Plan.

Mitigation Measure 10b: Prior to issuance of grading and building permits, the City of Grass Valley shall verify that building plans include provisions for the following measures to reduce air pollutant emissions throughout project operation:

- There shall be a limit of one wood-burning appliance per residence, and it shall be an EPA Phase II certified appliance. Also, each residence shall be equipped with a non-wood-burning source of heat.
- The project applicant shall provide, operate, and fund a green-waste drop-off site for residents.
- Streets shall be designed to maximize pedestrian access to transit stops.
- The project shall provide for pedestrian access between bus service and major transportation points within the project, and between separate sections of the project, where feasible.

10.5 REFERENCES CITED

13 CCR 2025. Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants, from In-Use Heavy-Duty Diesel-Fueled Vehicles.

13 CCR 2449–2449.3 and Appendix A. General Requirements for In-Use Off-Road Diesel-Fueled Fleets.

Caltrans (California Department of Transportation). 1997. Caltrans Institute of Transportation Studies *Transportation Project-Level Carbon Monoxide Protocol* (CO Protocol). 1997

CAPCOA (California Air Pollution Control Officers Association). 2017. *California Emissions Estimator Model (CalEEMod) User's Guide Version 2016.3.2*. Prepared by BREEZE Software, A Division of Trinity Consultants in collaboration with South Coast Air Quality Management District and the California Air Districts. November 2017. Accessed November 2017. http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4.

CARB (California Air Resources Board). 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005.

CARB. 2016. "Ambient Air Quality Standards." Last updated May 4, 2016. Accessed June 20, 2016. Available at http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

CARB. 2018. "iADAM: Air Quality Data Statistics." Accessed August 20, 2018. http://www.arb.ca.gov/adam/topfour/topfour1.php.

City of Grass Valley. 1999a. *City of Grass Valley 2020 General Plan*. Adopted November 23, 1999.

City of Grass Valley. 1999b. *City of Grass Valley General Plan Update Environmental Impact Report.* Prepared for the City of Grass Valley by Quad Knopf. August 1999.

City of Grass Valley. 2014. *2014–2019 Housing Element*. September 2014.

California Department of Finance. 2018. *Report E-1: Population Estimates for Cities, Counties, and the State January 1, 2017 and 2018*. May 1, 2018.

Quad Knopf. 1998. *Grass Valley General Plan Background Report*. Prepared November 1998.

NSAQMD (Northern Sierra Air Quality Management District). 2016. *Guidelines for Assessing and Mitigating Air Quality Impacts of Land Use Projects*.

Sierra Club v. County of Fresno. 2018. Case No. S219783. December 24, 2018. http://www.courts.ca.gov/opinions/documents/S219783A.PDF

CHAPTER 11
CLIMATE CHANGE

Development of the proposed Dorsey Marketplace (proposed project) is expected to generate greenhouse gas (GHG) emissions during construction and occupancy of the proposed project. This section addresses project impacts on climate change and analyzes the type and quantity of GHG emissions that would be generated by the development of the proposed project. Alternative A would provide for up to 90 apartment units, approximately 178,960 square feet of commercial space, and a 3,200-square-foot clubhouse. Alternative B would provide 1721 apartments, approximately 104,350 square feet of commercial space, approximately 8,500 square feet of office space, and a 3,200-square-foot clubhouse.

Information used to prepare this section includes:

- *City of Grass Valley 2020 General Plan* (City of Grass Valley 1999a)
- *City of Grass Valley General Plan Update Environmental Impact Report* (City of Grass Valley 1999b)
- California Emissions Estimator Model (CalEEMod) (Appendix I)

No comments were received in response to the Notice of Preparation regarding GHG emissions. The Notice of Preparation and letters received in response to it are provided in Appendix A.

11.1 ENVIRONMENTAL SETTING

The Greenhouse Effect and GHGs

Climate change refers to any significant change in measures of Earth's climate, such as temperature, precipitation, and wind patterns, lasting for an extended period of time (decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human-caused, can cause changes in Earth's energy balance, including variations in the sun's energy reaching Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by Earth's atmosphere (EPA 2017a).

The greenhouse effect is the trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. The greenhouse effect traps heat in the troposphere through a threefold process, as follows: Short-wave radiation emitted by the sun is absorbed by the Earth, the Earth emits a portion of this energy in the form of long-wave radiation, and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward the Earth. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature and creates a pleasant, livable environment on Earth. Human activities that emit additional GHGs to the atmosphere

increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise.

The scientific record of the Earth's climate shows that the climate system varies naturally over a wide range of time scales, and that, in general, climate changes prior to the Industrial Revolution in the 1700s can be explained by natural causes, such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. Recent climate changes, in particular the warming observed over the past century, however, cannot be explained by natural causes alone. Rather, it is extremely likely that human activities have been the dominant cause of that warming since the mid-twentieth century, and is the most significant driver of observed climate change (EPA 2017a; IPCC 2013). Human influence on the climate system is evident from the increasing GHG concentrations in the atmosphere, positive radiative forcing, observed warming, and improved understanding of the climate system (IPCC 2013). The atmospheric concentrations of GHGs have increased to levels unprecedented in the last 800,000 years, primarily from fossil fuel emissions and secondarily from emissions associated with land use changes (IPCC 2013). Continued emissions of GHGs will cause further warming and changes in all components of the climate system, which is discussed further in Potential Effects of Climate Change.

Greenhouse Gases

A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. As defined in California Health and Safety Code Section 38505(g) for purposes of administering many of the state's primary GHG emissions reduction programs, GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3) (see also California Environmental Quality Act (CEQA) Guidelines Section 15364.5).[1] Some GHGs, such as CO_2, CH_4, and N_2O, occur naturally and are emitted into the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases, such as HFCs, PFCs, and SF_6, which are associated with certain industrial products and processes. The following paragraphs provide a summary of the most common GHGs and their sources.[2]

[1] Climate-forcing substances include GHGs and other substances such as black carbon and aerosols. This discussion focuses on the seven GHGs identified in California Health and Safety Code Section 38505, so impacts associated with other climate-forcing substances are not evaluated herein.

[2] The descriptions of GHGs are summarized from the Intergovernmental Panel on Climate Change's (IPCC) Second Assessment Report (IPCC 1995), IPCC's Fourth Assessment Report (2007), California Air Resources Board's "Glossary of Terms Used in GHG Inventories" (CARB 2017a), and U.S. Environmental Protection Agency's "Glossary of Climate Change Terms" (EPA 2016).

Carbon Dioxide. CO_2 is a naturally occurring gas and a by-product of human activities, and is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO_2 include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO_2 are the combustion of fuels such as coal, oil, natural gas, and wood, and changes in land use.

Methane. CH_4 is produced through both natural and human activities. CH_4 is a flammable gas and is the main component of natural gas. Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide. N_2O is produced through natural and human activities, mainly through agricultural activities and natural biological processes, although fuel burning and other processes also create N_2O. Sources of N_2O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and using N_2O as a propellant (such as in rockets, racecars, and aerosol sprays).

Fluorinated Gases. Fluorinated gases (also referred to as F-gases) are powerful synthetic GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes for stratospheric ozone-depleting substances (e.g., chlorofluorocarbons (CFCs), hydrochlorofluorocarbon (HCFCs), and halons). The most prevalent fluorinated gases are the following:

- **Hydrofluorocarbons:** HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals used as alternatives to ozone-depleting substances for many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are used in manufacturing.
- **Perfluorocarbons:** PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced as alternatives, with HFCs, to the ozone-depleting substances. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. Since PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.
- **Sulfur Hexafluoride:** SF_6 is a colorless gas soluble in alcohol and ether and slightly soluble in water. SF_6 is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.

- **Nitrogen Trifluoride:** NF_3 is used in the manufacture of a variety of electronics, including semiconductors and flat-panel displays.

Chlorofluorocarbons. CFCs are synthetic chemicals that have been used as cleaning solvents, refrigerants, and aerosol propellants. CFCs are chemically unreactive in the lower atmosphere (troposphere), and the production of CFCs was prohibited in 1987 due to the chemical destruction of stratospheric ozone.

Hydrochlorofluorocarbons. HCFCs are a large group of compounds whose structure is very close to that of CFCs—containing hydrogen, fluorine, chlorine, and carbon atoms—but including one or more hydrogen atoms. Like HFCs, HCFCs are used in refrigerants and propellants. HCFCs were also used in place of CFCs for some applications; however, their use in general is being phased out.

Black Carbon. Black carbon is a component of fine particulate matter, which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation, and darkens the surface of snow and ice, which accelerates heat absorption and melting. Black carbon is short-lived and varies spatially, which makes it difficult to quantify its global warming potential. Diesel particulate matter emissions are a major source of black carbon and are toxic air contaminants that have been regulated and controlled in California for several decades to protect public health. Because of the California Air Resources Board's (CARB) regulations pertaining to diesel engines, diesel fuels, and burning activities, CARB estimates that annual black carbon emissions in California were reduced by 70% between 1990 and 2010, with 95% control expected by 2020 (CARB 2014).

Water Vapor. The primary source of water vapor is evaporation from the ocean, with additional vapor generated by sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Water vapor is the most important, abundant, and variable GHG in the atmosphere, and maintains a climate that is necessary for life.

Ozone. Tropospheric ozone, which is created by photochemical reactions involving gases from both natural sources and human activities, acts as a GHG. Stratospheric ozone, which is created by the interaction between solar ultraviolet radiation and molecular oxygen (O_2), plays a decisive role in the stratospheric radiative balance. Depletion of stratospheric ozone due to chemical reactions that may be enhanced by climate change results in an increased ground-level flux of ultraviolet-B radiation.

Aerosols. Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat, and can cool the atmosphere by reflecting light.

Global Warming Potential

Gases in the atmosphere can contribute to climate change both directly and indirectly. Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the Earth (e.g., affect cloud formation or albedo (i.e., the reflection of radiation)) (EPA 2016). The Intergovernmental Panel on Climate Change (IPCC) developed the global warming potential (GWP) concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2014). The reference gas used is CO_2; therefore, GWP-weighted emissions are measured in metric tons (MT) of carbon dioxide equivalent (CO_2e).

The current version of the California Emissions Estimator Model (CalEEMod) (Version 2016.3.2) assumes that the GWP for CH_4 is 25 (so emissions of 1 MT of CH_4 are equivalent to emissions of 25 MT of CO_2), and the GWP for N_2O is 298, based on the IPCC Fourth Assessment Report (IPCC 2007). The GWP values identified in CalEEMod were applied to the proposed project.

Contributions to Greenhouse Gas Emissions

United States Emissions. Per the U.S. Environmental Protection Agency's (EPA) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2016 (EPA 2018), total U.S. GHG emissions were approximately 6,511.3 million metric tons (MMT) CO_2e in 2016. The primary GHG emitted by human activities in the United States was CO_2, which represented approximately 81.6% of total GHG emissions (5,310.9 MMT CO_2e). The largest source of CO_2, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 93.5% of CO_2 emissions in 2016 (4,966.0 MMT CO_2e). Relative to 1990, gross United States GHG emissions in 2016 ~~are~~ were higher by 2.4%, down from a high of 15.7% greater than 1990 levels in 2007. GHG emissions decreased from 2015 to 2016 by 1.9% (126.8 MMT CO_2e), and, overall, net emissions in 2016 were 11.1% less than 2005 levels (EPA 2018). Specific to energy usage, associated CO_2 emissions "rose in 2018 after three years of continuous decline. Emissions in the transportation and industrial sector helped drive this trend, growing in 2017 and at an accelerated pace in 2018 on the back of stronger economic growth. But the big change year-on-year was in the buildings and power sectors. Growth in buildings sector emissions, as we noted in our January report, was primarily due to a reversion to historical average winter weather after an atypically warm 2017. That was partially responsible for the increase of 20 million metric tons in power sector emissions, coming after 2017 decline of 78 million metric tons" (Rhodium Group 2019).

State of California Emissions. According to California's 2000–2016 GHG emissions inventory (2018 edition), California emitted 429.40 MMT CO_2e in 2016, including emissions resulting from out-of-state electrical generation (CARB 2018). The sources of GHG emissions in California include transportation, industrial uses, electric power production from both in-state and out-of-state sources, commercial and residential uses, agriculture, high GWP substances, and recycling and waste. The California GHG emissions source categories (as defined in CARB's 2008 Climate Change Scoping Plan: A Framework for Change (Scoping Plan) (CARB 2008)), and their relative contributions in 2016 are presented in Table 11-1.

Table 11-1
Greenhouse Gas Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO_2e)	Percent of Total[a]
Transportation	169.38	39%
Industrial uses[b]	89.61	21%
Electricity generation[c]	68.58	16%
Residential and commercial uses	39.36	9%
Agriculture	33.84	8%
High GWP substances	19.78	5%
Recycling and waste	8.81	2%
Totals	**429.40**	**100%**

Source: CARB 2018.
Notes: GHG = greenhouse gas; MMT CO_2e = million metric tons of carbon dioxide equivalent; GWP = global warming potential. Emissions reflect 2016 California GHG inventory.
[a] Percentage of total has been rounded and total may not sum due to rounding.
[b] The Aliso Canyon natural gas leak event released 1.96 MMT CO_2e of unanticipated emissions in 2015 and 0.53 MMT CO_2e in 2016. These leak emissions will be fully mitigated according to legal settlement and are tracked separately from routine inventory emissions.
[c] Includes emissions associated with imported electricity, which account for 26.28 MMT CO_2e.

Neither the City of Grass Valley (City) nor Nevada County has adopted plans, policies, or regulations for the purpose of reducing GHG emissions. No official GHG inventory has been completed for the City.

Potential Effects of Human Activity on Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The 2014 *Intergovernmental Panel on Climate Change Synthesis Report* indicated that warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice have, and rising sea levels (IPCC 2014).

In California, climate change impacts have the potential to affect sea level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, and electricity demand and supply (CCCC 2012). The primary effect of global climate change has been a 0.2°C rise in average global tropospheric temperature per decade, determined from meteorological measurements worldwide between 1990 and 2005. Scientific modeling predicts that continued emissions of GHGs at or greater than current rates would induce more extreme climate changes during the twenty-first century than were observed during the twentieth century. A warming of about 0.2°C (0.36°F) per decade is projected, and there are identifiable signs that global warming could be taking place.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The average temperatures in California have increased, leading to more extreme hot days and fewer cold nights; shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year; sea levels have risen; and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010).

An increase in annual average temperature is a reasonably foreseeable effect of climate change. Observed changes over the last several decades across the western United States reveal clear signals of climate change. Statewide average temperatures increased by about 1.7°F from 1895 to 2011, and warming has been greatest in the Sierra Nevada (CCCC 2012). By 2050, California is projected to warm by approximately 2.7°F greater than 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 4.1 to 8.6°F, depending on emissions levels. Springtime warming—a critical influence on snowmelt—will be particularly pronounced. Summer temperatures will rise more than winter temperatures, and the increases will be greater in inland California, compared to the coast. Heat waves will be more frequent, hotter, and longer. There will be fewer extremely cold nights (CCCC 2012). A decline of Sierra snowpack, which accounts for approximately half of the surface water storage in California and much of the state's water supply, by 30% to as much as 90% is predicted over the next 100 years (CAT 2006).

Model projections for precipitation over California continue to show the Mediterranean pattern of wet winters and dry summers with seasonal, year-to-year, and decade-to-decade variability. For the first time, however, several of the improved climate models shift toward drier conditions by the mid-to-late twenty-first century in Central and, most notably, Southern California. By late-century, all projections show drying, and half of them suggest 30-year average precipitation will decline by more than 10% below the historical average (CCCC 2012).

Wildfire risk in California will increase as a result of climate change. Earlier snowmelt, higher temperatures and longer dry periods over a longer fire season will directly increase wildfire risk. Indirectly, wildfire risk will also be influenced by potential climate-related changes in vegetation and ignition potential from lightning. However, human activities will continue to be the biggest factor in ignition risk. It is estimated that the long-term increase in fire occurrence associated with a higher emissions scenario is substantial, with increases in the number of large fires statewide ranging from 58% to 128% greater than historical levels by 2085. Under the same emissions scenario, estimated burned area will increase by 57%–169%, depending on location (CCCC 2012).

Reduction in the suitability of agricultural lands in the state for traditional crop types may occur. While effects may occur, adaptation could allow farmers and ranchers to minimize potential negative effects on agricultural outcomes through adjusting timing of plantings or harvesting and changing crop types. Because the specific effects of climate change in the project area are uncertain, it would be speculative to predict which crop types and agricultural operations would be substantially affected.

Public health-related effects of increased temperatures and prolonged temperature extremes, including heat stroke, heat exhaustion, and exacerbation of existing medical conditions, could be particular problems for the elderly, infants, and those who lack access to air conditioning or cooled spaces (CNRA 2009).

A summary of current and future climate change impacts to resource areas in California, as discussed in the *Safeguarding California: Reducing Climate Risk* (CNRA 2014), is provided as follows.

Agriculture. The impacts of climate change on the agricultural sector are far more severe than the typical variability in weather and precipitation patterns that occur year to year. Some of the specific challenges faced by the agricultural sector and farmers include more drastic and unpredictable precipitation and weather patterns; extreme weather events that range from severe flooding to extreme drought, to destructive storm events; significant shifts in water availably and water quality; changes in pollinator lifecycles; temperature fluctuations, including extreme heat stress and decreased chill hours; increased risks from invasive species and weeds, agricultural pests and plant diseases; and disruptions to the transportation and energy infrastructure supporting agricultural production. These challenges and associated short-term and long-term impacts can have both positive and negative effects on agricultural production. For example, changes in weather patterns can foster longer growing periods for certain crops, but simultaneously increase the likelihood of pests. It is predicted that current crop and livestock production will suffer long-term negative effects resulting in a substantial decrease in the agricultural sector if not managed or mitigated (CNRA 2014).

Biodiversity and Habitat. The state's extensive biodiversity stems from its varied climate and assorted landscapes, which have resulted in numerous habitats where species have evolved and adapted over time. The preservation of California's unique biological heritage is of ever-increasing importance given the forecasted impacts associated with climate change.

Similar to the agricultural sector, there are a number of climate change challenges the biodiversity sector must contend with, on top of the ever-increasing pressures of habitat loss and fragmentation, population growth, pollution, plant and animal diseases, and other human-induced impacts. Specific climate change challenges to biodiversity and habitat include species migration in response to climatic changes, range shift and novel combinations of species; pathogens, parasites and disease; invasive species; extinction risks; changes in the timing of seasonal life-cycle events; food web disruptions; threshold effects (i.e., a change in the ecosystem that results in a "tipping point" beyond which irreversible damage or loss has occurs).

Habitat restoration, conservation, and resource management across California and through collaborative efforts amongst public, private and nonprofit agencies has assisted in the effort to fight climate change impacts on biodiversity and habitat. One of the key measures in these efforts is ensuring species' ability to relocate as temperature and water availability fluctuate as a result of climate change, based on geographic region. As such, it is critical to ensure habitat corridors, linkages and connectivity are established to allow species the mobility to move from place to place as resources change over time. Continued collaborative efforts are required across agencies to ensure the health of existing habitat, wildlife, and the geographic extent of their existence required to support biodiversity (CNRA 2014).

Emergency Management. "Emergency management includes actions to prepare for, mitigate against, respond to and recover from emergencies and disasters that impact our communities, critical infrastructure and resources by lessoning the likelihood, severity and duration of the consequences of the incident" (CNRA 2014). "Hazard mitigation is any action taken to reduce or eliminate the long-term risk to human life and property from natural or man-made hazards" (CNRA 2014). In California, preparing, mitigating, and responding to and/or recovering from a natural disaster usually is done in the context of an earthquake, wildfire or severe flood event.

Energy. The energy sector provides California residents with a supply of reliable and affordable energy through a complex integrated system. Specific climate change challenges for the energy sector include temperature, fluctuating precipitation patterns, increasing extreme weather events and sea level rise. Increasing temperatures and reduced snowpack negatively impact the availability of a steady flow of snowmelt to hydroelectric reservoirs. Higher temperatures also reduce the capacity of thermal power plants since power plant cooling is less efficient at higher ambient temperatures. Natural gas infrastructure in coastal California is threatened by sea level rise and extreme storm events (CNRA 2014).

Forestry. Forests occupy approximately 33% of California's 100 million acres and provide key benefits such as wildlife habitat, absorption of carbon dioxide, renewable energy and building materials. The most significant climate change related risk to forests is accelerated risk of wildfire and more frequent and severe droughts. Droughts have resulted in more large scale mortalities and combined with increasing temperatures have led to an overall increase in wildfire risks. Increased wildfire intensity subsequently increases public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts and vegetation conversions. These factors contribute to decreased forest growth, geographic shifts in tree distribution, loss of fish and wildlife habitat and decreased carbon absorption. These losses can also negatively impact the timber industry as well as recreation opportunities. Climate change may result in increased establishment of non-native species, particularly in rangelands where invasive species are already a problem. Invasive species may be able to exploit temperature or precipitation changes, or quickly occupy areas denuded by fire, insect mortality or other climate change effects on vegetation (CNRA 2014).

Ocean and Coastal Ecosystems and Resources. Sea level rise, changing ocean conditions and other climate change stressors are likely to exacerbate long-standing challenges related to ocean and coastal ecosystems in addition to threatening people and infrastructure located along the California coastline and in coastal communities. Sea level rise in addition to more frequent and severe coastal storms and erosion are threatening vital infrastructure such as roads, bridges, power plants, ports and airports, gasoline pipes, and emergency facilities as well as negatively impacting the coastal recreational assets such as beaches and tidal wetlands. Water quality and ocean acidification threaten the abundance of seafood and other plant and wildlife habitats throughout California and globally (CNRA 2014).

Public Health. Climate change can impact public health through various environmental changes and is the largest threat to human health in the twenty-first Century. Changes in precipitation patterns affect public health primarily through potential for altered water supplies, and extreme events such as heat, floods, droughts, and wildfires. Increased frequency, intensity and duration of extreme heat and heat waves is likely to increase the risk of mortality due to heat related illness as well as exacerbate existing chronic health conditions. Other extreme weather events are likely to negatively impact air quality and increase or intensify respiratory illness such as asthma and allergies. Additional health impacts that may be impacted by climate change include cardiovascular disease, vector-borne diseases, mental health impacts, and malnutrition injuries. Increased frequency of these ailments is likely to subsequently increase the direct risk of injury and/or mortality (CNRA 2014).

Transportation. Residents of California rely on airports, seaports, public transportation and an extensive roadway network to gain access to destinations, goods and services. While the transportation industry is a source of greenhouse gas emissions it is also vulnerable to climate

change risks. Particularly, sea level rise and erosion threaten many coastal California roadways, airports, seaports, transit systems, bridge supports and energy and fueling infrastructure. Increasing temperatures and extended periods of extreme heat threaten the integrity of the roadways and rail lines. High temperatures cause the road surfaces to expand which leads to increased pressure and pavement buckling. High temperatures can also cause rail breakages which could lead to train derailment. Other forms of extreme weather events, such as extreme storm events, can negatively impact infrastructure which can impair movement of peoples and goods, or potentially block evacuation routes and emergency access roads. Increased wildfires, flooding, erosion risks, landslides, mudslides and rockslides can all profoundly impact the transportation system and pose a serious risk to public safety (CNRA 2014).

Water. Water resources in California support residences, plants, wildlife, farmland, landscapes and ecosystems and bring trillions of dollars in economic activity. Climate change could seriously impact the timing, form, amount of precipitation, runoff patterns, and frequency and severity of precipitation events. Higher temperatures reduce the amount of snowpack and lead to earlier snowmelt, which can impact water supply availability, natural ecosystems and winter recreation. Water supply availability during the intense dry summer months is heavily dependent on the snowpack accumulated during the winter time. Increased risk of flooding has a variety of public health concerns including water quality, public safety, property damage, displacement and post-disaster mental health problems. Prolonged and intensified droughts can also negatively groundwater reserves and result in increased overdraft and subsidence. Droughts can also negatively impact agriculture and farmland throughout the state. The higher risk of wildfires can lead to increased erosion, which can negatively impact watersheds and result in poor water quality. Water temperatures are also prone to increase, which can negatively impact wildlife that rely on a specific range of temperatures for suitable habitat (CNRA 2014).

11.2 REGULATORY SETTING

Federal Regulations

Massachusetts vs. EPA. On April 2, 2007, in *Massachusetts v. EPA*, the Supreme Court directed the EPA Administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the EPA Administrator is required to follow the language of Section 202(a) of the Clean Air Act. On December 7, 2009, the EPA Administrator signed a final rule with the following two distinct findings regarding GHGs under Section 202(a) of the CAA:

- The Administrator found that elevated concentrations of GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations. This is referred to as the "endangerment finding."
- The Administrator further found the combined emissions of GHGs—CO_2, CH_4, N_2O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is referred to as the "cause or contribute finding."

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the CAA.

Energy Independence and Security Act of 2007. The Energy Independence and Security Act of 2007 (December 2007), among other key measures, would do the following, which would aid in the reduction of national GHG emissions (EPA 2007):

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel by 2022.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020, and directs the National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy-efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards. In response to the U.S. Supreme Court ruling previously discussed, the Bush Administration issued Executive Order (EO) 13432 in 2007 directing the EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011, and in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016.

In 2010, President Barack Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards

projected to achieve 163 grams per mile of CO_2 by model year 2025 on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021. On January 12, 2017, the EPA finalized its decision to maintain the current GHG emissions standards for model years 2022–2025 cars and light trucks (EPA 2017b).

In addition to the regulations applicable to cars and light-duty trucks previously described, in 2011, the EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018. The standards for CO_2 emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6%–23% over the 2010 baselines.

In August 2016, the EPA and NHTSA announced the adoption of phase two of the program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model years 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The final standards are expected to lower CO_2 emissions by approximately 1.1 billion MT and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA 2016).

Clean Power Plan and New Source Performance Standards for Electric Generating Units. On October 23, 2015, EPA published a final rule (effective December 22, 2015) establishing the Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (80 FR 64510–64660), also known as the Clean Power Plan. These guidelines prescribe how states must develop plans to reduce GHG emissions from existing fossil-fuel-fired electric generating units. The guidelines establish CO_2 emission performance rates representing the best system of emission reduction for two subcategories of existing fossil-fuel-fired electric generating units: (1) fossil-fuel-fired electric utility steam-generating units, and (2) stationary combustion turbines. Concurrently, EPA published a final rule (effective October 23, 2015) establishing Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (80 FR 64661–65120). The rule prescribes CO_2 emission standards for newly constructed, modified, and reconstructed affected fossil-fuel-fired electric utility generating units. Implementation of the Clean Power Plan has been stayed by the U.S. Supreme Court pending resolution of several lawsuits.

State Regulations

The statewide GHG emissions regulatory framework is summarized as follows by category: state climate change targets, building energy, renewable energy and energy procurement, mobile

sources, solid waste, water, and other state regulations and goals. The following text describes executive orders (EO), assembly bills (AB), senate bills (SB), and other regulations and plans that would directly or indirectly reduce GHG emissions.

State Climate Change Targets

EO S-3-05. EO S-3-05 (June 2005) established the following statewide goals: GHG emissions should be reduced to 2000 levels by 2010, GHG emissions should be reduced to 1990 levels by 2020, and GHG emissions should be reduced to 80% less than 1990 levels by 2050.

AB 32 and CARB's Climate Change Scoping Plan. In furtherance of the goals established in EO S-3-05, the Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020.

Under AB 32, CARB is responsible for and is recognized as having the expertise to carry out and develop the programs and requirements necessary to achieve the GHG emissions reduction mandate of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions from specified sources. This program is used to monitor and enforce compliance with established standards. CARB also is required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions. AB 32 relatedly authorized CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emissions limitation, emissions reduction measure, or market-based compliance mechanism adopted.

In 2007, CARB approved a limit on the statewide GHG emissions level for 2020, consistent with the determined 1990 baseline (427 MMT CO_2e). CARB's adoption of this limit is in accordance with Health and Safety Code Section 38550.

Further, in 2008, CARB adopted the Climate Change Scoping Plan: A Framework for Change (Scoping Plan) in accordance with Health and Safety Code Section 38561. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions for various emission sources/sectors to 1990 levels by 2020. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team (CAT) early actions and additional GHG reduction features by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. The key elements of the Scoping Plan are the following (CARB 2008):

1. Expanding and strengthening existing energy efficiency programs and building and appliance standards.

2. Achieving a statewide renewable energy mix of 33%.
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions.
4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.
6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

In the Scoping Plan, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of approximately 28.5% from the otherwise projected 2020 emissions level (i.e., those emissions that would occur in 2020 absent GHG-reducing laws and regulations, referred to as "business-as-usual"). For purposes of calculating this percent reduction, CARB assumed that all new electricity generation would be supplied by natural gas plants, that no further regulatory action would impact vehicle fuel efficiency, and that building energy efficiency codes would be held at 2005 standards.

In the 2011 Final Supplement to the Scoping Plan's Functional Equivalent Document, CARB revised its estimates of the projected 2020 emissions level in light of the economic recession and the availability of updated information about GHG reduction regulations. Based on the new economic data, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of 21.7% (down from 28.5%) from the business-as-usual conditions (CARB 2011a). When the 2020 emissions level projection also was updated to account for newly implemented regulatory measures, including Pavley I (model years 2009–2016) and the Renewables Portfolio Standard (RPS) (12% to 20%) (CPUC 2015), CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of 16% (down from 28.5%) from the business-as-usual conditions.

In 2014, CARB adopted the First Update to the Climate Change Scoping Plan: Building on the Framework (First Update). The stated purpose of the First Update is to "highlight California's success to date in reducing its GHG emissions and lay the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80% less than 1990 levels by 2050" (CARB 2014). The First Update found that California is on track to meet the 2020 emissions reduction mandate established by AB 32, and noted that California could reduce emissions further by 2030 to levels

squarely in line with those needed to stay on track to reduce emissions to 80% less than 1990 levels by 2050 if the state realizes the expected benefits of existing policy goals.

In conjunction with the First Update, CARB identified "six key focus areas comprising major components of the state's economy to evaluate and describe the larger transformative actions that will be needed to meet the state's more expansive emission reduction needs by 2050" (CARB 2014). Those six areas are energy, transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure), agriculture, water, waste management, natural and working lands. The First Update identifies key recommended actions for each sector that will facilitate achievement of EO S-3-05's 2050 reduction goal.

CARB's research efforts presented in the First Update indicate that it has a "strong sense of the mix of technologies needed to reduce emissions through 2050" (CARB 2014). Those technologies include energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies.

As part of the First Update, CARB recalculated the state's 1990 emissions level using more recent GWPs identified by the IPCC. Using the recalculated 1990 emissions level (431 MMT CO_2e) and the revised 2020 emissions level projection identified in the 2011 Final Supplement (CARB 2011a), CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of approximately 15% (instead of 28.5% or 16%) from the business-as-usual conditions (CARB 2014).

On January 20, 2017, CARB released its 2017 Climate Change Scoping Plan Update (Second Update) for public review and comment (CARB 2017). This update presents CARB's strategy for achieving the state's 2030 GHG target as established in Senate Bill (SB) 32 (discussed as follows), including continuing the Cap-and-Trade Program through 2030, and includes a new approach to reduce GHGs from refineries by 20%. The Second Update incorporates approaches to cutting short-lived climate pollutants (SLCPs) under the Short-Lived Climate Pollutant Reduction Strategy (a planning document that was adopted by CARB in March 2017), acknowledges the need for reducing emissions in agriculture, and highlights the work underway to ensure that California's natural and working lands increasingly sequester carbon. During development of the Second Update, CARB held a number of public workshops in the natural and working lands, agriculture, energy, and transportation sectors to inform development of the 2030 Scoping Plan Update (CARB 2016). When discussing project-level GHG emissions reduction actions and thresholds, the Second Update states, "achieving no net increase in GHG emissions is the correct overall objective, but it may not be appropriate or feasible for every development project. An inability to mitigate a project's GHG emissions to zero does not necessarily imply a substantial contribution to the

cumulatively significant environmental impact of climate change under CEQA" (CARB 2017). The Second Update was approved by CARB's Governing Board on December 14, 2017.

EO B-30-15. EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under EO S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing statewide GHG emissions to 40% less than 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing statewide GHG emissions to 80% less than 1990 levels by 2050, as set forth in EO S-3-05. To facilitate achievement of this goal, EO B-30-15 calls for an update to CARB's Scoping Plan to express the 2030 target in terms of MMT CO_2e. The executive order also calls for state agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets. EO B-30-15 does not require local agencies to take any action to meet the new interim GHG reduction target.

SB 32 and AB 197. SB 32 and AB 197 (enacted in 2016) are companion bills that set a new statewide GHG reduction targets, make changes to CARB's membership, increase legislative oversight of CARB's climate-change-based activities, and expand dissemination of GHG and other air-quality-related emissions data to enhance transparency and accountability. More specifically, SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% less than 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, to provide ongoing oversight over implementation of the state's climate policies. AB 197 also added two members of the Legislature to CARB as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and toxic air contaminants from reporting facilities; and requires CARB to identify specific information for GHG emissions reduction measures when updating the Scoping Plan.

SB 605 and SB 1383. SB 605 (2014) requires CARB to complete a comprehensive strategy to reduce emissions of SLCPs in the state, and SB 1383 (2016) requires CARB to approve and implement that strategy by January 1, 2018. SB 1383 also establishes specific targets for the reduction of SLCPs (40% less than 2013 levels by 2030 for CH_4 and HFCs, and 50% less than 2013 levels by 2030 for anthropogenic black carbon), and provides direction for reductions from dairy and livestock operations and landfills. Accordingly, and as previously mentioned, CARB adopted its Short-Lived Climate Pollutant Reduction Strategy (SLCP Reduction Strategy) in March 2017. The SLCP Reduction Strategy establishes a framework for the statewide reduction of emissions of black carbon, CH_4, and fluorinated gases.

Building Energy

Title 24, Part 6. Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California's building standards. Although not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically establishes Building Energy Efficiency Standards that are designed to ensure that new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and California Energy Commission (CEC) (and revised if necessary) (California Public Resources Code (PRC) Section 25402(b)(1)). The regulations receive input from members of industry and the public, with the goal of "reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy" (PRC Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (PRC Section 25402(d)) and cost effectiveness (PRC Sections 25402(b)(2) and (b)(3)). These standards are updated to consider and incorporate new energy-efficient technologies and construction methods. As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment.

The 2016 Title 24 standards are the currently applicable building energy efficiency standards, and became effective on January 1, 2017. In general, single-family homes built to the 2016 standards are anticipated to use about 28% less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards, and nonresidential buildings built to the 2016 standards will use an estimated 5% less energy than those built to the 2013 standards (CEC 2015a).

Title 24, Part 11. In addition to CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code is commonly referred to as CALGreen, and establishes minimum mandatory standards and voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality (CALGreen 2016). The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential, and state-owned buildings, and schools and hospitals. The CALGreen 2016 standards became effective on January 1, 2017. The mandatory standards require the following (CALGreen 2016):

- Mandatory reduction in indoor water use through compliance with specified flow rates for plumbing fixtures and fittings.
- Mandatory reduction in outdoor water use through compliance with a local water efficient landscaping ordinance or the California Department of Water Resources' Model Water Efficient Landscape Ordinance.

- 65% of construction and demolition waste must be diverted from landfills.
- Mandatory inspections of energy systems to ensure optimal working efficiency.
- Inclusion of electric vehicle charging stations or designated spaces capable of supporting future charging stations.
- Low-pollutant-emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle boards.

The CALGreen standards also include voluntary efficiency measures that are provided at two separate tiers and implemented at the discretion of local agencies and applicants. CALGreen's Tier 1 standards call for a 15% improvement in energy requirements, stricter water conservation, 65% diversion of construction and demolition waste, 10% recycled content in building materials, 20% permeable paving, 20% cement reduction, and cool/solar-reflective roofs. CALGreen's more rigorous Tier 2 standards call for a 30% improvement in energy requirements, stricter water conservation, 75% diversion of construction and demolition waste, 15% recycled content in building materials, 30% permeable paving, 25% cement reduction, and cool/solar-reflective roofs.

The California Public Utilities Commission (CPUC), CEC, and CARB also have a shared, established goal of achieving zero net energy for new construction in California. The key policy timelines are that all new residential construction in California will be zero net energy by 2020, and all new commercial construction in California will be zero net energy by 2030 (CPUC 2013).[3] As most recently defined by CEC in its 2015 Integrated Energy Policy Report, a zero net energy code building is "one where the value of the energy produced by on-site renewable energy resources is equal to the value of the energy consumed annually by the building" using the CEC's time-dependent valuation metric (CEC 2015b).

Title 20. Title 20 of the California Code of Regulations requires manufacturers of appliances to meet state and federal standards for energy and water efficiency. Performance of appliances must be certified through the CEC to demonstrate compliance with standards. New appliances regulated under Title 20 include refrigerators, refrigerator-freezers, and freezers; room air conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwaters; clothes washers and dryers; cooking products; electric motors; low-voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing each type of appliance covered under the regulations, and appliances must meet the standards for energy performance, energy design, water performance, and water design. Title 20 contains three types of standards for appliances: federal and state standards for

[3] It is expected that achievement of the zero net energy goal will occur via revisions to the Title 24 standards.

federally regulated appliances, state standards for federally regulated appliances, and state standards for non-federally regulated appliances.

SB 1. SB 1 (2006) established a $3 billion rebate program to support the goal of the state to install rooftop solar energy systems with a generation capacity of 3,000 megawatts through 2016. SB 1 added sections to the Public Resources Code, including Chapter 8.8, California Solar Initiative, that require building projects applying for ratepayer-funded incentives for photovoltaic systems to meet minimum energy efficiency levels and performance requirements. Section 25780 established that it is a goal of the state to establish a self-sufficient solar industry in which solar energy systems are a viable mainstream option for homes and businesses within 10 years of adoption, and to place solar energy systems on 50% of new homes within 13 years of adoption. SB 1, also termed "GoSolarCalifornia," was previously titled "Million Solar Roofs."

AB 1470. This bill established the Solar Water Heating and Efficiency Act of 2007. The bill made findings and declarations of the Legislature relating to the promotion of solar water heating systems and other technologies to reduce natural gas demand. The bill defined several terms for purposes of the act. The bill required the CEC to evaluate the data available from a specified pilot program, and, if it made a specified determination, to design and implement a program of incentives for the installation of 200,000 solar water heating systems in homes and businesses throughout the state by 2017.

AB 1109. Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general purpose lighting to reduce electricity consumption by 50% for indoor residential lighting and by 25% for indoor commercial lighting.

Renewable Energy and Energy Procurement

SB 1078. SB 1078 (2002) established the RPS program, which requires an annual increase in renewable generation by the utilities equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017. This goal was subsequently accelerated, requiring utilities to obtain 20% of their power from renewable sources by 2010.

SB 1368. SB 1368 (2006) requires the CEC to develop and adopt regulations for GHG emissions performance standards for the long-term procurement of electricity by local publicly owned utilities. These standards must be consistent with the standards adopted by the CPUC. This effort will help protect energy customers from financial risks associated with investments in carbon-intensive generation by allowing new capital investments in power plants whose GHG emissions are as low as or lower than new combined-cycle natural gas plants by requiring imported electricity to meet GHG performance standards in California and by requiring that the standards be developed and adopted in a public process.

SB X1 2. SB X1 2 (2011) expanded the RPS by establishing that 20% of the total electricity sold to retail customers in California per year by December 31, 2013, and 33% by December 31, 2020, and in subsequent years be secured from qualifying renewable energy sources. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and that meets other specified requirements with respect to its location. In addition to the retail sellers previously covered by the RPS, SB X1 2 added local, publicly owned electric utilities to the RPS.

SB 350. SB 350 (2015) further expanded the RPS by establishing that 50% of the total electricity sold to retail customers in California per year by December 31, 2030, be secured from qualifying renewable energy sources. In addition, SB 350 includes the goal to double the energy efficiency savings in electricity and natural gas final end uses (such as heating, cooling, lighting, or class of energy uses on which an energy-efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the CPUC, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal.

Mobile Sources

AB 1493. In a response to the transportation sector accounting for more than half of California's CO_2 emissions, AB 1493 was enacted in July 2002. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles that are primarily used for noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. In 2009–2012, standards resulted in a reduction of approximately 22% in GHG emissions compared to emissions from the 2002 fleet, and in 2013–2016, standards resulted in a reduction of approximately 30%.

EO S-1-07. Issued on January 18, 2007, EO S-1-07 sets a declining low-carbon fuel standard for GHG emissions measured in CO_2e grams per unit of fuel energy sold in California. The target of the low-carbon fuel standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020. Carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered. CARB adopted the implementing regulation in April 2009. The regulation is expected to increase the production of biofuels, including those from alternative sources, such as algae, wood, and agricultural waste.

SB 375. SB 375 (2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 required CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035. Regional metropolitan

planning organizations (MPO) are then responsible for preparing a Sustainable Communities Strategy (SCS) within their Regional Transportation Plan (RTP). The goal of the SCS is to establish a forecasted development pattern for the region that, after considering transportation measures and policies, will achieve, if feasible, the GHG reduction targets. If an SCS is unable to achieve the GHG reduction target, an MPO must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

Pursuant to Government Code Section 65080(b)(2)(K), an SCS does not regulate the use of land; supersede the land use authority of cities and counties; or require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process.

Advanced Clean Cars Program. In January 2012, CARB approved the Advanced Clean Cars program, an emissions-control program for model years 2015 through 2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single, coordinated package. The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars (CARB 2011b). To improve air quality, CARB implemented new emission standards to reduce smog-forming emissions beginning with 2015 model-year vehicles. It is estimated that by 2025, cars will emit 75% less smog-forming pollution than the average new car sold before 2012. To reduce GHG emissions, CARB, in conjunction with the EPA and NHTSA, adopted new GHG standards for model years 2017 to 2025 vehicles; the new standards are estimated to reduce GHG emissions by 34% by 2025. The Zero Emissions Vehicle (ZEV) program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles in 2018 to 2025 model years. The Clean Fuels Outlet regulation will ensure that fuels such as electricity and hydrogen are available to meet the fueling needs of the new advanced technology vehicles as they come to the market.

EO B-16-12. EO B-16-12 (2012) directs state entities under the governor's direction and control to support and facilitate development and distribution of ZEVs. This executive order also sets a long-term target of reaching 1.5 million ZEVs on California's roadways by 2025. On a statewide basis, EO B-16-12 also establishes a GHG emissions reduction target from the transportation sector equaling 80% less than 1990 levels by 2050. In furtherance of this executive order, the governor convened an Interagency Working Group on ZEVs that has published multiple reports regarding the progress made on the penetration of ZEVs in the statewide vehicle fleet.

AB 1236. AB 1236 (2015), as enacted in California's Planning and Zoning Law, requires local land use jurisdictions to approve applications for the installation of electric vehicle charging stations, as defined, through the issuance of specified permits unless there is substantial evidence in the record that the proposed installation would have a specific, adverse impact on public health or safety, and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact. The bill provides for appeal of that decision to the planning commission. The bill required local land use jurisdictions with a population of 200,000 or more residents to adopt an ordinance, by September 30, 2016, to create an expedited and streamlined permitting process for electric vehicle charging stations. Prior to this statutory deadline, in August 2016, the County of Los Angeles Board of Supervisors adopted Ordinance No. 10437 (N.S.) adding a section to the Los Angeles County Code related to the expedited processing of electric-vehicle charging-station permits consistent with AB 1236.

SB 350. In 2015, SB 350, the Clean Energy and Pollution Reduction Act, was enacted into law. As one of its elements, SB 350 establishes a statewide policy for widespread electrification of the transportation sector, recognizing that such electrification is required for achievement of the state's 2030 and 2050 reduction targets (see Public Utilities Code Section 740.12).

Solid Waste

AB 939 and AB 341. In 1989, AB 939, known as the Integrated Waste Management Act (PRC Sections 40000 et seq.), was passed because of the increase in waste stream and decrease in landfill capacity. The statute established the California Integrated Waste Management Board, which oversees a disposal reporting system. AB 939 mandated a reduction of waste being disposed of, and jurisdictions were required to meet diversion goals of all solid waste through source reduction, recycling, and composting activities of 25% by 1995 and 50% by 2000.

AB 341 (2011) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that not less than 75% of solid waste generated be source-reduced, recycled, or composted by 2020, and annually thereafter. In addition, AB 341 required the California Department of Resources Recycling and Recovery (CalRecycle) to develop strategies to achieve the state's policy goal. CalRecycle has conducted multiple workshops and published documents that identify priority strategies that CalRecycle believes will assist the state in reaching the 75% goal by 2020.

Water

EO B-29-15. In response to the ongoing drought in California, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25% relative to water use in 2013. The term of the executive order extended through February 28, 2016, although many of the directives have since become permanent water-efficiency standards and requirements. The

executive order includes specific directives that set strict limits on water usage in the state. In response to EO B-29-15, the California Department of Water Resources modified and adopted a revised version of the Model Water Efficient Landscape Ordinance that, among other changes, significantly increased the requirements for landscape water use efficiency and broadened its applicability to include new development projects with smaller landscape areas.

Other State Regulations and Goals

SB 97. SB 97 (Dutton) (August 2007) directed the Governor's Office of Planning and Research (OPR) to develop guidelines under CEQA for the mitigation of GHG emissions. In 2008, the OPR issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents. The advisory indicated that the lead agency should identify and estimate a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities (OPR 2008). The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures necessary to reduce GHG emissions to a level that is less than significant. The CNRA adopted the CEQA Guidelines amendments in December 2009, which became effective in March 2010.

Under the amended CEQA Guidelines in the California Code of Regulations (CCR), a lead agency has the discretion to determine whether to use a quantitative or qualitative analysis, or apply performance standards to determine the significance of GHG emissions resulting from a particular project (14 CCR 15064.4(a)). The CEQA Guidelines require a lead agency to consider the extent to which a project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)). The CEQA Guidelines also allow a lead agency to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through implementation of project features or off-site measures. The adopted amendments do not establish a GHG emissions threshold, but allow a lead agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts. The CNRA also acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions (CNRA 2009).

With respect to GHG emissions, the CEQA Guidelines state in CCR Section 15064.4(a) that lead agencies should "make a good faith effort, to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions. The CEQA Guidelines note that an agency may identify emissions by either selecting a "model or methodology" to quantify the emissions, or by relying on "qualitative analysis or other performance based standards" (14 CCR 15064.4(a)). Section 15064.4(b) states that the lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment: the extent a project may increase or reduce GHG emissions compared to the existing environmental setting; whether project

emissions exceed a threshold of significance that the lead agency determines applies to the project; and the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)).

EO S-13-08. EO S-13-08 (November 2008) is intended to hasten California's response to the impacts of global climate change, particularly sea-level rise. Therefore, the executive order directs state agencies to take specified actions to assess and plan for such impacts. The final 2009 California Climate Adaptation Strategy report was issued in December 2009 (CNRA 2009), and an update, Safeguarding California: Reducing Climate Risk, followed in July 2014 (CNRA 2014). To assess the state's vulnerability to climate change, the report summarizes key climate change impacts to the state for the following areas: agriculture, biodiversity and habitat, emergency management, energy, forestry, ocean and coastal ecosystems and resources, public health, transportation, and water. Issuance of the Safeguarding California: Implementation Action Plans followed in March 2016 (CNRA 2016). A draft of the Safeguarding California Plan: 2017 Update was prepared to communicate current and needed actions that state government should take to build climate change resiliency (CNRA 2017).

2015 State of the State Address. In January 2015, Governor Brown in his inaugural address and annual report to the Legislature established supplementary goals that would further reduce GHG emissions over the next 15 years. These goals include an increase in California's renewable energy portfolio from 33% to 50%, a reduction in vehicle petroleum use for cars and trucks by up to 50%, measures to double the efficiency of existing buildings, and measures to decrease emissions associated with heating fuels.

2016 State of the State Address. In his January 2016 address, Governor Brown established a statewide goal to bring per-capita GHG emissions down to 2 MT per person, which reflects the goal of the Global Climate Leadership Memorandum of Understanding (Under 2 Memorandum of Understanding) to limit global warming to less than 2°C by 2050. The Under 2 Memorandum of Understanding agreement pursues emission reductions of 80%–95% less than 1990 levels by 2050 and/or reach a per-capita annual emissions goal of less than 2 MT by 2050. A total of 187 jurisdictions representing 38 countries and six continents, including California, have signed or endorsed the Under 2 Memorandum of Understanding (Under 2 Coalition 2017).

Local Regulations

Northern Sierra Air Quality Management District

The NSAQMD is the primary agency responsible for planning to meet federal and state ambient air quality standards in Nevada, Plumas and Sierra counties. The NSAQMD develops rules and regulations for stationary sources and equipment, prepares emissions inventories and air quality

management planning documents, and conducts source testing and inspections. NSAQMD has not adopted specific guidance or thresholds applicable to the analysis of a project's contribution to GHG emissions and associated climate change effects.

City of Grass Valley General Plan

The Land Use (LU) Element and Circulation (C) Element of the Grass Valley 2020 General Plan include goals (G), objectives (O) and policies (P) related to reducing GHG emissions mainly by encouraging infill development, improving public transportation, and reducing reliance on automobiles. The following goals and objectives are applicable to the proposed project:

2-LUG: Promote infill as an alternative to peripheral expansion where feasible.

3-LUG: In areas of new development, plan for diversity of land uses and housing types, including mixed use developments.

6-LUG: Promote a jobs/housing balance within the Grass Valley region in order to facilitate pleasant, convenient and enjoyable working conditions for residents, including opportunities for short home to work journeys.

4-LUO: Reduction in environmental impacts associated with peripheral growth.

15-LUO: Reduction in the number of vehicle miles driven.

5-LUP: Actively market infill and available parcels during contracts with developers and community members.

6-LUP: Develop a more specific development strategy for identified infill parcels following General Plan adoption.

7-LUP: Utilize California Redevelopment Law to provide incentives to infill development.

8-LUP: Encourage and facilitate mixed-use developments on infill sites.

1-CG: Provide a circulation system that utilizes a variety of transportation modes, including alternative means of transportation.

5-CO: Convenient, safe and functional facilities for pedestrians, bicyclists and equestrians.

6-CP: Locate transit stops and park and ride facilities near freeway interchanges and in conjunction with higher density residential and mixed-use developments.

8-CP: Incorporate separated, non-motorized paths in street cross-section designs whenever feasible.

City of Grass Valley Energy Action Plan

In November 2018 the City of Grass Valley adopted an Energy Action Plan that establishes a goal for the year 2035 of reducing annual utility-supplied electricity use by 36% and reducing annual natural gas use by 29%. The Energy Action Plan evaluates existing energy usage within the City limits and identifies specific goals and strategies for increasing energy efficiency, water efficiency, and renewable energy usage. The strategies focus on voluntary measures that can be taken by residents, businesses, and public agencies; further the majority of energy savings forecast under the Energy Action Plan are attributed to existing structures rather than new development. Additionally, the Energy Action Plan recognizes that there are other energy-consuming sectors such as transportation that are not addressed in the Plan due to funding constraints, thus the plan is not a comprehensive climate action plan.

11.3 IMPACTS

This section identifies and discusses the environmental impacts resulting from the proposed project and suggests mitigation measures to reduce the level of impact. A detailed discussion of mitigation measures is included in Section 11.4, Mitigation Measures.

Methods of Analysis

The CalEEMod modeling program was used to estimate the proposed project's GHG emissions from all project sources, including in-home energy use, water consumption, and wastewater generation; mobile source emissions; and landfill emissions associated with solid waste generated at the site.

Significance Criteria

The significance criteria for evaluating GHG impacts associated with the implementation of the proposed project are as follows. Would the proposed project:

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

At this time, neither the NSAQMD nor the City has adopted numerical thresholds of significance for GHG emissions that would apply to the proposed project. The NSAQMD, however, recommends that all projects subject to CEQA review be considered in the context of GHG emissions and climate change impacts, and that CEQA documents should include a quantification of GHG emissions from all project sources, as well as minimize and mitigate GHG emissions as

feasible (Longmire 2018). The proposed project would generate GHG emissions only through short-term construction activities and long-term operational activities.

In light of the lack of established GHG emissions thresholds that would apply to the proposed project, CEQA allows lead agencies to identify thresholds of significance applicable to a proposed project that are supported by substantial evidence. Therefore, to establish additional context in which to consider the order of magnitude of the proposed project's construction-related GHG emissions, this analysis accounts for the following considerations by other government agencies and associations about what levels of GHG emissions constitute a cumulatively considerable incremental contribution to climate change:

- The Sacramento Metropolitan Air Quality Management District (SMAQMD) established thresholds including 1,100 metric tons CO_2e per year for the construction or operational phase of land use development projects, or 10,000 direct metric tons CO_2e per year from stationary source projects. If a project exceeds these mass thresholds, the level of mitigation is based on demonstrating consistency with CARB's Climate Change Scoping Plan and the AB 32 state goals for reducing GHG emissions, which is currently 21.7% reduction from 2020 "no action taken" emissions (SMAQMD 2014).
- The Placer County Air Pollution Control District (PCAPCD) recommends a tiered approach to determine if a project's GHG emissions would result in a significant impact. First, project GHG emissions are compared to the de minimis level of 1,100 MT CO_2e per year. If a project does not exceed this threshold, it does not have significant GHG emissions. If the project exceeds the de minimis level and does not exceed the 10,000 MT CO_2e per year bright line threshold, then the project's GHG emissions can be compared to the to the efficiency thresholds. These thresholds are 4.5 MT CO_2e per capita for residential projects in an urban area and 5.5 MT CO_2e per capita for residential projects in a rural area. For nonresidential development, the thresholds are 26.5 MT CO_2e per 1,000 sf for projects in urban areas and 27.3 MT CO_2e per 1,000 sf for projects in rural areas.
- The Bay Area Air Quality Management District (BAAQMD) has adopted a 1,100 metric tons of CO_2e per year as a project-level "bright line" GHG significance threshold that would apply to operational emissions from mixed land-use development projects, a threshold of 10,000 metric tons of CO_2e per year as the significance threshold for operational GHG emissions from stationary-source projects, or an efficiency threshold of 4.6 MT CO_2e per service population per year (BAAQMD 2017).
- The South Coast Air Quality Management District (SCAQMD) formed a GHG CEQA Significance Threshold Working Group to work with SCAQMD staff on developing GHG CEQA significance thresholds until statewide significance thresholds or guidelines are established. From December 2008 to September 2010, the SCAQMD hosted working group

meetings and revised the draft threshold proposal several times, although it did not officially provide these proposals in a subsequent document. The SCAQMD has continued to consider adoption of significance thresholds for residential and general land use development projects. The most recent proposal, issued in September 2010, uses a tiered approach to evaluate potential GHG impacts from various uses. Under option 1, separate screening thresholds are proposed for residential projects (3,500 MT CO_2e per year), commercial projects (1,400 MT CO_2e per year), and mixed-use projects (3,000 MT CO_2e per year). Under option 2, a single numerical screening threshold of 3,000 MT CO_2e per year would be used for all non-industrial projects (SCAQMD 2010).

Based on the range of established GHG thresholds, the 1,100 metric tons CO_2e per year threshold was applied as a conservative GHG threshold for the proposed project.

Impact Analysis

Impact 11-1: Would the project impede the City or state efforts to meet AB 32 standards for the reduction of GHG emissions?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation measure 11a	Mitigation measure 11a
Significance after mitigation:	Significant and unavoidable	Significant and unavoidable

Alternative A

Construction Emissions

Construction of Alternative A would result in GHG emissions that would primarily be associated with use of off-road construction equipment, on-road hauling and vendor trucks, and worker vehicles. CalEEMod was used to calculate the annual GHG emissions based on the construction scenario described in Chapter 10, Air Quality. Construction of the proposed project is anticipated to occur over a three year period, beginning in the summer of 2019 with project buildout early 2021. Table 11-2 presents construction emissions for the proposed project for all years of construction.

Table 11-2
Estimated Annual Construction Greenhouse Gas Emissions – Alternative A

Year	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
2019	396.0	0.1	0.0	398.9
2020	368.8	0.1	0.0	701.3
2021	46.1	<0.1	0.0	46.3
Total	**810.9**	**0.2**	**0.0**	**1,146.5**

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.
Source: Appendix I

As shown in Table 11-2, estimated total construction GHG emissions would be approximately 1,147 MT CO_2e. Construction GHG emissions are a one-time release and are typically considered separate from operational emissions, as global climate change is inherently a cumulative effect that occurs over a long period of time and is quantified on a yearly basis. Even though construction-related emissions will cease at the end of the construction, the pollutants will remain in the atmosphere for long periods afterwards, in some cases for hundreds of years. To ensure that the combined emissions associated with construction and operations are considered together, the proposed project's construction GHG emissions have been amortized over the lifetime of the project, which is assumed for this analysis to be 30 years, and included in the annual operational GHG emissions. The proposed project would result in amortized construction emissions of 38 MT CO_2e. Amortized construction emissions are discussed under "Operational Impacts," as follows.

Operational Emissions

Long-term operations of the proposed project would result in GHG emissions through area sources (landscape maintenance equipment); energy use (natural gas and generation of electricity consumed by the project); generation of electricity associated with wastewater treatment and with water supply, treatment, and distribution; and solid waste disposal. Annual GHG emissions from these sources were estimated using CalEEMod. In addition, reductions from the 2019 Title 24 Building Energy Efficiency Standards were estimated. The 2019 standards will further reduce energy used and associated GHG emissions compared to current standards. Nonresidential buildings built to the 2019 standards are anticipated to use an estimated 30% less energy than those built to the 2016 standards and low-rise residential (which includes multi-family buildings that have three habitable stories or less) built under the 2019 standards will use approximately 53% less energy than those under the 2016 standards (CEC 2018).

CalEEMod default data, including temperature, trip characteristics, variable start information, emissions factors, vehicle mix, and trip distances, were conservatively used for the model inputs. Emission factors representing the vehicle mix and emissions for 2022 (the first full year of operation) were used to estimate emissions associated with full buildout of the proposed project. In addition, GHG emission reductions associated with the requirement in Mitigation Measure 11a to install EV charging stations in 1.5% of the total parking spaces were quantified.

CalEEMod was also used to estimate emissions from the proposed project's area sources, which includes operation of gasoline-powered landscape maintenance equipment, which produces minimal GHG emissions.

Water supplied to the proposed project requires the use of electricity. Accordingly, the supply, conveyance, treatment, and distribution of water would indirectly result in GHG emissions through use of electricity. Furthermore, it was assumed that the proposed project would meet utility emission factors consistent with the 33% RPS by 2020 because the Pacific Gas and Electric (PG&E) is required to meet its 33% RPS requirement. Additionally, the proposed project emissions were adjusted to account for the CALGreen mandate to reduce water consumption by up to 20%.

The proposed project would generate solid waste, and, therefore, result in CO_2e emissions associated with landfill off-gassing. Consistent with the state's diversion rate goals set forth in AB 341, the proposed project is subject to numerous recycling requirements including, (1) organic waste (food, green waste, compostable paper) recycling required through the state's implementation of AB 1826; (2) establishing recycling service with the local waste management company required by the state's implementation of AB 341, and (3) comply with the Grass Valley Municipal Code Section 8.24.040 standards for disposal of waste and recycling material with adequate capacity, number and distribution to serve the proposed project.

The estimated operational GHG emissions from mobile sources, area sources, energy consumption, solid waste, water consumption, and wastewater treatment associated with the proposed project in 2022 are shown in Table 11-3. Details of the emission calculations are provided in Appendix I.

Table 11-3
Estimated Operational Greenhouse Gas Emissions – Alternative A

Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	64.9	<0.1	<0.1	65.3
Energy (natural gas and electricity)	804.0	<0.1	<0.1	808.1
Reduction from meeting 2019 Title 24 Standards	(275.5)	(<0.1)	(<0.1)	(276.9)
Mobile	5,410.4	0.4	0.0	5,420.7
Reduction from EV charging	—	—	—	(203.7)
Solid waste	11.8	0.7	0.0	29.2
Water supply and wastewater	31.4	0.5	<0.1	47.7
Construction (amortized over 30 years)	—	—	—	*38.2*
			Total Project Emissions	~~6,409.2~~5,928.6

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrogen dioxide; CO_2e = carbon dioxide equivalent.
Project GHG emissions are based on the "mitigated" CalEEMod outputs which includes meeting the 2019 Title 24 standards, installation of EV charging for 1.5% of all parking spaces (per Mitigation Measure 11a), incorporation of water reduction consistent with CALGreen, and a 75% diversion of solid waste per Assembly Bill 341.
Source: Appendix I

As shown in Table 11-3, the total Alternative A GHG emissions during operation were estimated to be approximately ~~6,409~~6,132 MT CO_2e per year which includes amortized construction emissions of 38 MT CO_2e per year. With installation of EV charging stations as required under Mitigation Measure 11a, Alternative A would emit 5,929 MT CO_2e annually. As previously discussed, based on range of established GHG thresholds, a GHG threshold of 1,100 MT CO_2e was used for comparison to the evaluate the proposed project's GHG emission impacts. Because development of Alternative A would substantially exceed this threshold, Alternative A's GHG emissions prior to mitigation would be potentially significant. Mitigation Measure 11a requires that the site plan include a variety of improvements that would minimize GHG emissions associated with project operations by supporting use of alternative modes of transportation, energy efficiency, efficient water use, and reductions in the amount of heat that may be generated by developed/paved surfaces within the project site. This includes specific requirements for energy efficient improvements to residential units. It also stipulates requirements to provide pedestrian facilities throughout the project site, which would be consistent with the proposed site plans. Although Mitigation Measure 11a requires provision of site improvements that would reduce the project's GHG emission, approximately ~~89~~91% of Alternative A's annual GHG emissions are from mobile sources and these would not be further reduced (compared to the emissions shown in Table 11-3) by the requirements of Mitigation Measure 11a. Thus, Alternative A's contribution to GHGs is considered cumulatively considerable and is a **significant and unavoidable** impact.

Alternative B

GHG emissions associated with construction and operation of the Alternative B were calculated using the same construction scenario described in Chapter 10 of this EIR. In summary, the Alternative B was assumed to be constructed from 2019 through 2021. CalEEMod was also used to estimate GHG emissions resulting from buildout of the Alternative B. The first full year after buildout was assumed to be 2022.

Table 11-4 shows the estimated maximum daily construction emissions associated with the construction phases of Alternative B. Complete details of the emissions calculations are provided in Appendix I.

Table 11-4
Estimated Annual Construction Greenhouse Gas Emissions – Alternative B

Year	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
2019	396.0	0.1	0.0	398.9
2020	698.8	0.1	0.0	701.3
2021	46.1	<0.1	0.0	46.3

Table 11-4
Estimated Annual Construction Greenhouse Gas Emissions – Alternative B

Total	**1,140.9**	**0.2**	**0.0**	**1,146.5**

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent.
Source: Appendix I.

As shown in Table 11-4, estimated total construction GHG emissions would be approximately 1,147 MT CO_2e as a result of construction-related activities. Construction GHG emissions are a one-time release and are typically considered separate from operational emissions, as global climate change is inherently a cumulative effect that occurs over a long period of time and is quantified on a yearly basis. Even though construction-related emissions will cease at the end of the construction, the pollutants will remain in the atmosphere for long periods afterwards, in some cases for hundreds of years. To ensure that the combined emissions associated with construction and operations are considered together, the proposed project's construction GHG emissions have been amortized over the lifetime of the project, which is assumed for this analysis to be 30 years, and included in the annual operational GHG emissions. The proposed project would result in amortized construction emissions of 38 MT CO_2e. Amortized construction emissions are accounted for under the following operational impacts.

The estimated operational GHG emissions from mobile sources, area sources, energy consumption, solid waste, water consumption, and wastewater treatment associated with the proposed project in 2022 are shown in Table 11-5. Details of the emission calculations are provided in Appendix I.

Table 11-5
Estimated Operational Greenhouse Gas Emissions – Alternative B

Emission Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	123.3	<0.1	<0.1	124.1
Energy (natural gas and electricity)	702.7	<0.1	<0.1	706.4
Reduction from meeting 2019 Title 24 Standards	(275.9)	(<0.1)	(<0.1)	(277.4)
Mobile	5,993.2	0.4	0.0	6,004.4
Reduction from EV charging	—	—	—	(210.6)
Solid waste	11.8	0.7	0.0	29.2
Water supply and wastewater	31.4	0.5	<0.1	47.7
Construction (amortized over 30 years)	—	—	—	38.2
			Total Project Emissions	~~6,950.0~~6,462.0

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrogen dioxide; CO_2e = carbon dioxide equivalent.
Project GHG emissions are based on the "mitigated" CalEEMod outputs which includes meeting the 2019 Title 24 standards, installation of EV charging for 1.5% of all parking spaces, incorporation of water reduction consistent with CALGreen, and a 75% diversion of solid waste per Assembly Bill 341.

Source: Appendix I

As shown in Table 11-5, the total Alternative B GHG emissions during operation were estimated to be approximately ~~6,950~~6,671 MT CO_2e per year which includes amortized construction emissions of 38 MT CO_2e per year. With installation of EV charging stations as required under Mitigation Measure 11a, Alternative A would emit 6,462 MT CO_2e annually. As previously discussed, based on range of established GHG thresholds, a GHG threshold of 1,100 MT CO_2e was used for comparison to the evaluate the proposed project's GHG emission impacts. Because development of Alternative B would substantially exceed this threshold, Alternative B's GHG emissions prior to mitigation would be potentially significant. Mitigation Measure 11a would minimize GHG emissions associated with project operations, however, approximately ~~90~~93% of Alternative B's annual GHG emissions are from mobile sources which would not be further reduced by Mitigation Measure 11a (compared to the emissions shown in Table 11-5). Thus, Alternative B's contribution to GHGs is considered cumulatively considerable and is a **significant and unavoidable** impact.

Impact 11-2: Would the project conflict with the City's Climate Action Plan?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than significant

Alternative A and Alternative B

There are currently no adopted local or regional GHG reduction plans applicable to the proposed project. In 2018, t~~T~~he City of Grass Valley ~~is in the process of developing~~ adopted an Energy Action Plan that ~~will provide~~ describes various strategies and goals to accelerate energy efficiency, renewable energy, and water efficiency projects by residents, businesses and public agencies. The Energy Action Plan identifies a goal of reducing the projected annual utility-supplied electricity use in the City in 2035 by 36% and reducing annual natural gas use by 29%. The strategies in the Energy Action Plan are voluntary measures that are predominantly expected to be applied to existing structures rather than new development. Additionally, the Energy Action Plan recognizes that there are other energy-consuming sectors such as transportation that are not addressed in the Plan due to funding constraints, thus the plan is not a comprehensive GHG reduction plan or climate action plan.

At the regional level, the Nevada County Transportation Commission (NCTC) adopted the *2015–2035 Nevada County Regional Transportation Plan* (RTP) in order to establish the short-term (2016 to 2026) and long-term (2026 to 2036) regional transportation needs in Nevada County and to facilitate the efficient development and implementation of projects while maintaining public health and environmental quality (NCTC 2018). Although the RTP does not regulate land use or supersede the

exercise of land use authority by NCTC's member jurisdictions (i.e., Grass Valley or other cities within Nevada County), the RTP is a relevant regional reference document for purposes of evaluating the intersection of land use and transportation patterns and seeks to reduce air quality issues associated with future growth by increasing the efficiency of the transportation system and increasing alternative transportation options (NCTC 2018). Although, the proposed project would increase traffic within the project area due to the influx of residents and employment, short-term projections have identified and accounted for such growth within the RTP. Regarding long-term impacts, the expansion of Dorsey Drive is included in the RTP as a long-term financially constrained (funded) improvement project which would be required to accommodate future growth within the project area. Furthermore, the transportation impact analysis proposes project-related improvements for study area intersections and roadway segments including Dorsey Drive, in order to lessen traffic related impacts. Therefore, the proposed project would not conflict with the RTP.

The Scoping Plan, approved by CARB on December 12, 2008, provides a framework for actions to reduce California's GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. As such, the Scoping Plan is not directly applicable to specific projects. Relatedly, in the Final Statement of Reasons for the Amendments to the CEQA Guidelines, the CNRA observed that "[t]he [Scoping Plan] may not be appropriate for use in determining the significance of individual projects because it is conceptual at this stage and relies on the future development of regulations to implement the strategies identified in the Scoping Plan" (CNRA 2009). Under the Scoping Plan, however, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles) and associated fuels (e.g., Low Carbon Fuel Standard), among others. To the extent that these regulations are applicable to the project, the project would comply will all regulations adopted in furtherance of the Scoping Plan to the extent required by law.

Regarding consistency with SB 32 (goal of reducing GHG emissions to 40% less than 1990 levels by 2030) and EO S-3-05 (goal of reducing GHG emissions to 80% less than 1990 levels by 2050), there are no established protocols or thresholds of significance for that future-year analysis. However, CARB has expressed optimism with regard to both the 2030 and 2050 goals. It states in the First Update to the Climate Change Scoping Plan that "California is on track to meet the near-term 2020 GHG emissions limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32" (CARB 2014). With regard to the 2050 target for reducing GHG emissions to 80% less than 1990 levels, the First Update to the Climate Change Scoping Plan states the following (CARB 2014):

> This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80% below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions (CARB 2014).

In other words, CARB believes that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targets set forth in AB 32, SB 32, and EO S-3-05. This is confirmed in California's 2017 Climate Change Scoping Plan (Second Update), which states, "This Plan draws from the experiences in developing and implementing previous plans to present a path to reaching California's 2030 GHG reduction target. The Plan is a package of economically viable and technologically feasible actions to not just keep California on track to achieve its 2030 target, but stay on track for a low- to zero-carbon economy by involving every part of the state" (CARB 2017). The Second Update also states that although "the Scoping Plan charts the path to achieving the 2030 GHG emissions reduction target, we also need momentum to propel us to the 2050 statewide GHG target (80% less than 1990 levels). In developing this Scoping Plan, we considered what policies are needed to meet our mid-term and long-term goals" (CARB 2017).

Finally, neither the City of Grass Valley nor the NSAQMD have adopted GHG reduction measures that would apply to the proposed project. At this time, no mandatory GHG regulations or finalized agency guidelines would apply to implementation of the proposed project, and no conflict would occur. This impact would be less than significant.

11.4 MITIGATION MEASURES

Mitigation Measure 11a: The following GHG emission reduction measures shall be implemented:

All residential buildings shall:

- Meet or exceed CALGreen Tier 1 requirements in place at the time of Building Permit issuance.
- ~~Be pre-plumbed and structurally engineered for the installation of~~ Include a ~~complete~~ solar energy system consistent with the 2019 California Building Code.
- Include a tankless water heating system, a whole house ceiling fan, and "Energy Star" appliances (stoves, dishwashers, and

any other appliances typically included within the initial installation by the builder).

- Include programmable thermostat timers.
- Include exterior outlets on all residential buildings to allow the use of electrically-powered landscape equipment.
- Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building Permit application for each residence only utilize low flow water fixtures such as low flow toilets, faucets, showers, etc.
- Prior to approval of Improvement Plans the applicant shall only show energy efficient lighting for all street, parking, and area lighting associated with the proposed project, including all on-site and off-site lighting.
- Pave all parking lots with reflective coatings (albedo = 0.30 or better). This measure is considered feasible if the additional cost is less than 10% of the cost of applying a standard asphalt product.
- Install EV charging stations on 1.5% of the constructed parking spaces, in addition to installing the infrastructure necessary to support future EV charging stations consistent with the 2019 California Building Code.

All non-residential buildings shall:

- Be pre-plumbed and structurally engineered for the installation of a complete solar energy system.
- Prior to the issuance of non-residential building permits, the proposed project applicant or its designee shall submit building plans illustrating that the proposed project's non-residential land uses shall achieve an 8% greater building energy efficiency than required by the current state energy efficiency standards in Title 24, Part 6 of the California Code of Regulations.
- Use "Energy Star" rated (or greater) roofing materials.
- Use both indoor and outdoor energy efficient lighting that meets or exceeds Title 24 requirements.
- Prior to the issuance of a Building Permit, the floor plans and/or exterior elevations submitted in conjunction with the Building

Permit application shall show that the proposed project includes a complete solar water heating system.

- Include an energy efficient heating system and an air conditioning system that exceeds the SEER ratio by a minimum of two points at the time of building permit issuance.
- Only use low flow water fixtures such as low flow toilets, faucets, showers, etc.
- Only use programmable thermostat timers.
- Prior to approval of Improvement Plans, the applicant shall only show energy efficient lighting for all street, parking, and area lighting associated with the proposed project, including all on-site and off-site lighting.
- Include pedestrian-friendly paths and cross walks in all parking lots, consistent with the proposed site plans.
- Pave all parking lots with reflective coatings (albedo = 0.30 or better). This measure is considered feasible if the additional cost is less than 10% of the cost of applying a standard asphalt product.
- Install EV charging stations on 1.5% of the constructed parking spaces, in addition to installing the infrastructure necessary to support future EV charging stations consistent with the 2019 California Building Code.
- Maximize the amount of drought tolerant landscaping by minimizing the amount of turf in all areas where this option is feasible as well as comply with the City's Model Water Efficient Landscape Ordinance for both residential and commercial land uses.
- Ensure recycling of construction debris and waste through administration by an on-site recycling coordinator and presence of recycling/separation areas.

11.5 REFERENCES CITED

14 CCR 15000–15387 and Appendices A–L. Guidelines for Implementation of the California Environmental Quality Act, as amended.

BAAQMD (Bay Area Air Quality Management District). 2017. *California Environmental Quality Act Air Quality Guidelines.* Updated May 2017. http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en.

CALGreen (California Green Building Code). 2016. 2016 Green Building Standards Code. https://codes.iccsafe.org/public/document/details/toc/657.

CARB (California Air Resources Board). 2008. *Climate Change Scoping Plan: A Framework for Change*. December 12, 2008. Accessed June 20, 2016. Available at http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf

CARB. 2011a. *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document*. August 19, 2011.

CARB. 2011b. *Facts About the Advanced Clean Cars Program*. Revised November 9, 2011. Accessed April 2018. https://www.arb.ca.gov/msprog/zevprog/factsheets/advanced_clean_cars_eng.pdf.

CARB. 2014. *First Update to the Climate Change Scoping Plan: Building on the Framework Pursuant to AB 32 – The California Global Warming Solutions Act of 2006*. May 2014. Accessed June 20, 2016. Available at http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.

CARB. 2016. "AB 32 Scoping Plan." CARB Website Tracking Progress on the 2030 Scoping Plan Update. December 2, 2016. https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm.

CARB. 2017. *The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target*. January 20, 2017. Accessed January 2017. https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf.

CARB. 2018. *California Greenhouse Gas Inventory for 2000–2016 by Category as Defined in the 2008 Scoping Plan.* Last updated June 22, 2018. https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_2000-16.pdf.

CAT (California Climate Action Team). 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. Sacramento, California: California Environmental Protection Agency, California Climate Action Team. March 2006. Accessed June 20, 2016. Available at http://www.climatechange.ca.gov/climate_action_team/reports/2006report/2006-04-03_FINAL_CAT_REPORT.PDF

CAT. 2010. *Climate Action Team Biennial Report*. Sacramento, California: California Environmental Protection Agency, California Climate Action Team. April 2010.

Accessed June 20, 2016. Available at http://www.energy.ca.gov/2010publications/CAT-1000-2010-004/CAT-1000-2010-004.PDF.

CCCC (California Climate Change Center). 2012. *Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California*. July 2012. Accessed December 2016. http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf.

CEC (California Energy Commission). 2015a. 2016 Building Energy Efficiency Standards – Frequently Asked Questions. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf.

CEC. 2015b. *2015 Integrated Energy Policy Report.* CEC-100-2015-001-CMF. Accessed September 25, 2017. http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-01/TN212017_20160629T154354_2015_Integrated_Energy_Policy_Report_Small_File_Size.pdf.

CEC. 2018. 2019 Building Energy Efficiency Standards Fact Sheet. March 2018. https://www.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf

City of Grass Valley. 1999a. *City of Grass Valley 2020 General Plan*. Adopted November 23, 1999.

City of Grass Valley. 1999b. *City of Grass Valley General Plan Update Environmental Impact Report*. Prepared for the City of Grass Valley by Quad Knopf. August 1999.

CNRA (California Natural Resources Agency). 2009. *2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008*. http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf.

CNRA. 2014. *Safeguarding California: Reducing Climate Risk: An Update to the 2009 California Climate Adaptation Strategy.* July 2014. Accessed May 2017. http://resources.ca.gov/docs/climate/Final_Safeguarding_CA_Plan_July_31_2014.pdf.

CNRA. 2016. *Safeguarding California: Implementation Action Plans*. March. Accessed May 2017. http://resources.ca.gov/docs/climate/safeguarding/Safeguarding%20California-Implementation%20Action%20Plans.pdf.

CNRA. 2017. *Draft Report Safeguarding California Plan: 2017 Update.* May. Accessed August 2017. http://resources.ca.gov/wp-content/uploads/2017/05/DRAFT-Safeguarding-California-Plan-2017-Update.pdf.

CPUC (California Public Utilities Commission). 2013. "California's Zero Net Energy Policies and Initiatives." September 18, 2013. http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=10718.

CPUC. 2015. Renewables Portfolio Standard. SB 350 Clean Energy and Pollution Reduction Act of 2015. Approved October 7, 2015.

EPA (U.S. Environmental Protection Agency). 2007. Energy Independence and Security Act of 2007. Accessed December 2016. https://www.gpo.gov/fdsys/pkg/BILLS-110hr6enr/pdf/BILLS-110hr6enr.pdf.

EPA. 2016. "Glossary of Climate Change Terms." August 9, 2016. Accessed August 2016. https://www3.epa.gov/climatechange/glossary.html.

EPA. 2017a. "Climate Change." Last updated January 19, 2017. Accessed January 2017. https://www.epa.gov/climatechange.

EPA. 2017b. *Carbon Pollution Standards for Cars and Light Trucks to Remain Unchanged Through 2025*. January 13. Accessed February 2017. https://www.epa.gov/newsreleases/carbon-pollution-standards-cars-and-light-trucks-remain-unchanged-through-2025.

EPA. 2018. *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2016.* EPA 430-R-18-003. https://www.epa.gov/sites/production/files/2018-01/documents/2018_complete_report.pdf.

EPA and NHTSA (Department of Transportation's National Highway Traffic Safety Administration). 2016. *Regulations and Standards: Heavy-Duty. EPA and DOT Finalize Greenhouse Gas and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles*. Last updated on August 30, 2016. https://www.epa.gov/newsreleases/epa-and-dot-finalize-greenhouse-gas-and-fuel-efficiency-standards-heavy-duty-trucks-0.

IPCC (Intergovernmental Panel on Climate Change). 1995. *IPCC Second Assessment Synthesis of Scientific-Technical Information Relevant to Interpreting Article 2 of the U.N. Framework Convention on Climate Change*.

IPCC. 2007. "Summary for Policymakers." In *Climate Change 2007: The Physical Science Basis*, edited by S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor, and H.L. Miller, 1–18. A Report of Working Group I of the IPCC. New York, New York, Cambridge University Press. Accessed September 2017. https://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf.

IPCC. 2013. *Climate Change 2013: The Physical Science Basis*. *Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Edited by T.F. Stocker, D. Qin, G.K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P.M. Midgley. New York, New York: Cambridge University Press. http://www.climatechange2013.org/images/report/WG1AR5_ALL_FINAL.pdf.

IPCC. 2014. *Climate Change 2014: Synthesis Report*. Contribution of Working Groups I, II, and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full_wcover.pdf.

Longmire, S. 2018. Email correspondence between S. Longmire (NSAQMD) and I. McIntire (Dudek). August 29, 2018.

NCTC (Nevada County Transportation Commission). 2018. *2015–2035 Nevada County Regional Transportation Plan*. January 2018.

OPR (California Governor's Office of Planning and Research). 2008. *Technical Advisory – CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review.* http://opr.ca.gov/docs/june08-ceqa.pdf.

Rhodium Group. 2019. *Final US Emissions Estimates for 2018.* May 2019. https://rhg.com/research/final-us-emissions-estimates-for-2018/

SMAQMD (Sacramento Metropolitan Air Quality Management District). 2014. *Justification for Greenhouse Gas Emissions Thresholds of Significance*. September 2014.

SCAQMD (South Coast Air Quality Management District). 2010. "Greenhouse Gases CEQA Significance Thresholds Working Group Meeting No. 15." September 28, 2010. Accessed December 2016. http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-main-presentation.pdf?sfvrsn=2.

Under 2 Coalition. 2017. Under 2 Memorandum of Understanding. Updated September 2017. Accessed September 2017. http://under2mou.org/wp-content/uploads/2015/05/Under2-Two-Pager-September-2017.pdf.

CHAPTER 12
GEOLOGY, SOILS, SEISMICITY, AND PALEONTOLOGY

This section addresses the potential impacts of the Dorsey Marketplace Project (proposed project) to geologic, soils, and paleontological resources as well as impacts related to seismic safety and soil stability. Site characteristics such as regional and local fault zones and seismic hazards are described based on site-specific information and published technical information. The primary sources referenced to prepare this section include the following:

- *City of Grass Valley 2020 General Plan* (City of Grass Valley 1999a)
- *City of Grass Valley General Plan Update Environmental Impact Report* (EIR) (City of Grass Valley 1999b)
- *City of Grass Valley General Plan Mineral Management Element* (City of Grass Valley 1993)
- *Grass Valley General Plan Update Background Report* (Quad Knopf 1998)
- *Preliminary Geotechnical Engineering Report for Former Spring Hill Mine Property APNs 35-260-62, 63 and 64 Grass Valley, California* (Appendix J-1).

No comments addressing geology, soils, seismicity, or paleontological resources were received in response to the Notice of Preparation (NOP). The NOP and comments received in response to the NOP are included in Appendix A.

12.1 ENVIRONMENTAL SETTING

Geology

Regional Setting

The City of Grass Valley is located on the western edge of the Sierra Nevada geomorphic province on the eastern edge of California's Great Central Valley (City of Grass Valley 1999a). Geomorphic provinces are areas comprised of similar geologic origin and erosional/depositional history. The Sierra Nevada geomorphic province extends approximately 400 miles from Lassen Peak in the north to the Mojave Desert in the south. The Sierra Nevada mountain range is a relatively recent formation, created 10 to 12 million years ago. The mountain range is composed mainly of metamorphic and igneous rocks. The Sierra Nevada batholith is mostly composed of Mesozoic (144 million to 245 million years ago), plutonic, and volcanic rocks. Along the western edge of the batholith lies a metamorphic belt, characterized by extremely folded and faulted Paleozoic (286 million to 700 million years ago) to Mesozoic metavolcanic and metasedimentary rocks. Tertiary (5 million to 65 million years ago) and Quaternary (1.8 million years ago to present) age volcanic and alluvial deposits overlie the older basement rocks in some areas. These formations have been exposed to millions of years of weathering and erosion of surface structures, such as from glacial

activities and stormwater runoff, leading to the creation of large rivers on both the western and eastern slopes. The formation extends below the sediment of the Great Valley; the Great Valley is a structural trough in which sediments from erosion of the surrounding mountain ranges have been deposited almost continuously since the Jurassic period (about 160 million years ago), leaving a flat valley floor composed of alluvial material.

Project Site Conditions

The project site is underlain by serpentine rock of mafic and ultramafic units of the Mesozoic and Jurassic aged Lake Combie Complex (Appendix J-1). The ultramafic and serpentine rocks on the project site are likely to contain significant levels of naturally occurring asbestos (Appendix J-1). A geological survey conducted in the 1890s mapped a large, east-west quartz vein running directly through the project site. A site visit conducted by Holdrege & Kull on August 28, 2007 identified exposed surface mine rock waste on approximately 6.5 acres of the 26.8-acre site, which generally consisted of slightly to moderately weathered, mineralized serpentine and diabase rock with abundant quartz (Appendix J-1). Waste rock was present in several benches extending down slope to the south and southwest of the knoll-top; smaller waste rock stockpiles were observed in the area between the bin and compressor foundations, and scattered waste rock was observed at the perimeter of the larger, main stockpiles of mine waste rock in the central and western portions of the site (Appendix J-1).

Topography

Regional Setting

The project site lies in the Sierra Nevada Foothills on the western side of the Sierra Nevada geomorphic province. Generally, ridge and rock formations are northwest-southeast trending, with drainage toward the southwest following the westward tilt of the Sierra Nevada fault block (City of Grass Valley 1993). Elevation in the Sierra Nevada increases gradually on the western slope and decreases more rapidly on the eastern slope forming a steep scarp above the adjacent Basin and Range province to the east. The western portion of Nevada County is comprised of rolling foothills forming a transition between the low-lying Sacramento Valley and the mountains to the east (City of Grass Valley 1999b).

Project Site Conditions

As reported in the project's Preliminary Geotechnical Engineering Report (Appendix J-1), the northern portion of the approximately 26.8-acre project site is relatively flat and slopes gently towards a knoll in the north central portion of the site. The central and southern portions of the site slope toward the south and southwest. Rock outcrop is present at several locations in the western, northern and eastern portions of the property. The western and central portions of the project site

contain significant abandoned mine features and the eastern portion of the project site is largely undeveloped. Surface conditions in the south-central and eastern portion of the site are generally obscured by dense manzanita. Existing elevations on site range from approximately 2,690 feet above mean sea level (MSL) at the northern boundary of the site along Dorsey Drive, rising to a high point of 2,704 feet above MSL at the highest point of the knoll, down to 2,610 feet above MSL at the southern boundary (where Spring Hill Drive currently terminates, and reaching a low point of 2,550 MSL in the southwestern portion of the site (Appendix J-1).

Mineral Resources

Regional Setting

Nevada County has five classes of mineral deposits, some of which are potentially found in Grass Valley. These include deposits formed by hydrothermal process such as gold-quartz veins, placer deposits, deposits formed by magmatic segregation, industrial minerals formed by diverse processes such as quartz, clay, barite, and carbonate rock, and construction aggregate deposits such as sand and gravel crushed stone deposits (City of Grass Valley 1993). The General Plan Mineral Management Element designates the following areas as regionally significant: North Star Rocks Products, Inc., located on the south side of Idaho Maryland Road just east of State Route 20/49; Grass Valley South area which encompasses a series of cavity-filling quartz-carbonate-ankerite veins and includes the historic Empire and North Star mines; and the Grass Valley northeast area encompassing a complex system of cavity-filling quartz veins that occupy a network of faults and fissures situated between Grass Valley and Weimer fault zones (City of Grass Valley 1993). Additionally, the City contains Mineral Resource Zone (MRZ) designations. All areas within Grass Valley are classified by the State Division of Mines and Geology as MRZ-2 (City of Grass Valley 1999b). Areas classified MRZ-2 are those containing potentially significant mining deposits, where existence of deposits may be actually measured or indicated by site data (MRZ-2a), or inferred from other sources (MRZ-2b).

Project Site Conditions

The site is dotted with mining activity; the mining target was large granite formations below the sediment layer. This includes mine shafts, tailing ponds, waste dumps, and building infrastructure, though little remains beyond the foundations. A site visit conducted by Holdrege & Kull on August 28, 2007 observed the location of the Spring Hill shaft in the central portion of the property, which appeared to be capped with concrete. Two additional shafts were observed on the project site; one approximately 500 feet northeast, which appeared to have been backfilled or capped and the second approximately 400 feet southwest was 10–15 feet wide and open to a depth of 15 feet or greater. A bin foundation, approximately 10 feet by 15 feet by 8 feet high, was observed between the Spring Hill shaft and the mill located to the southeast of the shaft. The mill foundation,

approximately 50 feet by 75 feet with concrete wall remnants up to 6 feet high was observed approximately 100 feet east of the bin foundation. Mill tailings were observed in the central and western portions of the site down slope of the mill foundation and apparent glory holes associated with excavation spoils were observed in the eastern portion of the site (Appendix J-1).

Soils

Soil type is one criterion used to evaluate potential impacts of development. Soils are typically considered for their resource value in agricultural production or for their potential development characteristics or constraints. Some soils are more stable under varying conditions and are better suited for development, while others are more susceptible to erosion and/or are subject to expansion under certain soil moisture conditions.

Regional Setting

Grass Valley and the surrounding region are located in an area of mountainous upland soils with nine soil associations occurring in Nevada County (City of Grass Valley 1999a). Of these nine associations four are commonly found in Grass Valley: Josephine-Sites-Mariposa association in central city and to the east, Secca-Boomer association northeast of the central city, Aiken-Cohasset association northwest of the center city, and Boomer-Sites-Sobrante association southeast of the central city (City of Grass Valley 1999a).

Project Site Conditions

According to the 1993 United States Department of Agriculture (USDA) Soil Survey of Western Nevada County, soil conditions across a majority of the site are mapped as Dubakella-rock outcrop complex, 5 to 50 percent slopes (Appendix J-1). Based on the degree of the slope, runoff is medium to rapid and the erosion hazard is low to moderate. Dubakella soil generally consists of brown, gravelly heavy loam to gravelly clay loam from the surface to an approximate depth of 10 inches. This layer is underlain by dark yellowish brown and brown, very cobbly clay to an approximate depth of 21 inches. Below this cobbly clay loam is weathered ultrabasic rock (Appendix J-1). The central portion of the site is mapped as “Placer Diggings”; however, based on the identification of past hard rock gold mining in this area this classification appears to be incorrect (Appendix J-1).

A small area in the eastern portion of the site is mapped Sites loam, 9 to 15 percent slopes, which has a medium runoff potential and moderate erosion hazard (Appendix J-1). Sites Loam generally consists of an approximately 12-inch thick surface layer of brown and yellowish-red heavy loam. This heavy loam is underlain by yellowish-red loam, red clay and light clay to an approximate depth of 78 inches. The loam, clay and light clay is further underlain by weathered metasedimentary and basic rock (Appendix J-1).

Saturated ground or seeps were not observed on the project site during the August 28, 2007 site visit conducted by Holdrege & Kull; however, it is likely that seepage would be encountered in excavations that reveal the point of contact between surface soil and weathered rock (Appendix J-1).

Seismicity

Regional Setting

Faults within California are classified as pre-quaternary (older than two million years), quaternary (younger than two million years), or historic (less than 200 years). Faults in the County's western half are pre-quaternary, while quaternary and historic active faults are found in the eastern portion of the County near Truckee (Quad Knopf 1998). The project site is located in the County's western half, which is in the low intensity zone for earthquake severity (DOC 2003). Neither Placer County nor Grass Valley is on the list of Cities and Counties affected by an Alquist-Priolo earthquake fault zone (DOC 2010).

Project Site Conditions

There are no known active faults beneath or near the project site, and no active fault trace is known to pass beneath the project site. The site is located within the Foothills Fault System, a type C fault zone (Appendix J-1). Type C denotes a fault with low seismicity and a low occurrence rate. The Foothills Fault System is generally believed to have originated from tectonic forces exerted by the uplift of the Sierra Nevada Mountain Range and not by the tectonic forces of plates moving past one another, as is typical of most California faults (City of Grass Valley 1999a). The Foothills Fault system is technically considered potentially active due to evidence of surface displacement (Spenceville and Oroville earthquakes) in the last 1.6 million years (City of Grass Valley 1999a). However, recent studies conducted along the Bear Mountain fault segment near Auburn indicate that the seismic hazard related to the system is low (City of Grass Valley 1999a). While not improbable, it is unlikely that a large magnitude earthquake would occur along this fault system given the recent studies, lack of recent movement, and lack of tectonic plate movement (City of Grass Valley 1999a). The closest fault line is Cleveland Hill fault near Oroville, approximately 26 miles northwest of the project site. Ground movement from earthquakes at an intermediate distance and from distant earthquakes could still be felt in Grass Valley.

Geologic Hazards

Landslides

Landslides may be triggered by oversaturated soils (after heavy rains) or by earthquakes. Several factors can affect the susceptibility of a slope to failure, including (1) steepness of the slope; (2) strength and bulk density of the soil or bedrock; (3) width, orientation, and pervasiveness of bedrock fractures,

faults, or bedding planes; (4) prevailing groundwater conditions; and (5) type and distribution of vegetation. Landslide potential is highest in steeply sloped areas, particularly those areas underlain with saturated and unconsolidated soil. Slopes at the project site range from 5 to 50 percent for Dubakella soils and 9 to 15 percent for Sites loam. Although slope movements can occur in any type of rock material, certain bedrock formations are more susceptible to such movement; generally, this type of bedrock is not found in the western portion of the County (Quad Knopf 1998).

Erosion

Soils throughout the City generally exhibit moderate erosion potential, particularly when exposed on embankment faces and slopes. Each of the three soil types occurring within the project site also exhibit moderate erosion potential. Erosion is typically most pronounced in areas of unconsolidated alluvial soils adjacent to waterways, and therefore, subject to hydraulic erosive forces and areas of soil denuded of vegetation, typically associated with construction or agricultural activities. The effects of erosion range from nuisance problems, such as increased siltation in storm drains, to extreme cases where watercourses are downcut and gullies develop that can eventually undermine adjacent structures or vegetation.

Seiche

Seiches are earthquake-generated waves within enclosed or restricted bodies of water. However, because no sizable lakes or reservoirs are present in the planning area, there are no seiche hazards in the City, including at the project site.

Subsidence

Subsidence is caused by surface land sinking into subsurface holes or fissures and may be caused by a variety of natural conditions in combination with human activity. In Grass Valley, the primary cause of actual and potential subsidence is previous underground withdrawal of material from mining (City of Grass Valley 1999b). Susceptibility of mine shafts to subsidence primarily depends on the water content of the soil above and depth and physical condition of the shaft (City of Grass Valley 1999b).

Naturally-occurring Asbestos

The project site contains serpentine rock formations from the mafic and ultramafic era. In the Sierra Nevada foothills area, ultramafic rock and serpentinite are associated with naturally occurring asbestos (NOA) minerals such as chrysotile, actinolite, and tremolite. Materials containing NOA can become a public health hazard if the rock is broken and the asbestos fibers or dust become airborne. Refer to Chapter 15, Hazards and Hazardous Materials, for additional discussion of the potential for naturally-occurring asbestos to be present, regulatory guidance for

managing naturally-occurring asbestos, and analysis of the potential for naturally-occurring asbestos to be released to the air during project construction.

Seismic Hazards

Surface rupture

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 and is intended to mitigate the hazard of surface faulting to structures for human occupancy. The California Geological Survey designates earthquake fault zones around the surface traces of active faults and publishes maps delineating these zones. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace. Surface rupture during earthquakes is typically limited to those areas immediately adjacent to the fault on which the event is occurring. The project site is not located in an established Alquist-Priolo fault zone (DOC 2010). The project site is located within the Foothill Fault System, but there are no known active faults beneath or near the project site. As discussed above, while the Foothills Fault System is technically considered potentially active, it is considered unlikely that a large magnitude earthquake would occur in this fault system (City of Grass Valley 1999a).

Groundshaking

The most serious direct earthquake hazard is the damage or collapse of buildings caused by groundshaking, which, in addition to property damage, can cause injury or death. Groundshaking is the vibration that radiates from the epicenter of an earthquake. The severity of groundshaking and its potential to cause damage to buildings is determined by several factors:

- The nature of the underlying soil and geology
- The location of the epicenter of the earthquake
- The duration and character of the ground motion
- The structural characteristics of a building
- The quality of workmanship and materials used in buildings

While it is unlikely that a large magnitude earthquake would occur in the Foothills Fault System, ground movement from earthquakes at an intermediate distance (i.e., the Truckee earthquake of 1968) and from distant earthquakes (i.e., the Winters-Vacaville 1892 event) could still be felt in Grass Valley. The primary tool that seismologists use to describe future ground-shaking hazards is a probabilistic seismic hazard assessment (PSHA). The U.S. Geological Survey (USGS) uses PSHA to generate a probability map for groundshaking based on the range of possible earthquake sources and estimates of their characteristic magnitudes. The USGS California Seismic Hazard map depicts values of the peak ground acceleration (PGA) based on a 2% probability of occurrence

in the next 50 years. Based on this map, the project site is expected to have a 2% probability of exceeding a PGA of 0.2g-0.3g in the next 50 years (USGS 2014). PGA on this map range from zero to greater than 0.5g indicating that 0.2g-0.3g is a moderate probability for groundshaking to occur at the project site.

Ground failure. Seismic related ground-failure could include liquefaction and lateral spreading, which occurs in unconsolidated basin deposits (i.e., silt, sand, and gravel) that are under saturated conditions.

Paleontological Resources

Paleontological resources are subsurface flora and fauna fossil resources from Plio-Pleistocene era less than 600,000 years ago. They include the fossilized remains or impressions of prehistoric plants and animals. They are valuable, nonrenewable, scientific resources used to document the existence of extinct life forms and to reconstruct the environments in which they lived. Fossils can be used to determine the relative ages of the depositional layers in which they occur and of the geologic events that created those deposits.

No state or local agencies have specific jurisdiction over paleontological resources or require a paleontological collecting permit to allow for the recovery of fossil remains discovered as a result of construction-related earth moving on state or private lands in a project site.

In the context of the California Environmental Quality Act (CEQA), fossils of land-dwelling vertebrates and their environment are considered important (i.e., significant) paleontological resources. Such fossils typically are found in river, lake, and bog deposits, although they can occur in nearly any type of sedimentary deposit.

12.2 REGULATORY SETTING

Federal Regulations

The Clean Water Act, administered by the U.S. Army Corps of Engineers, regulates soils disturbance as it affects wetlands and other waters of the United States. The National Pollutant Discharge Elimination System is a federal regulation intended to protect surface water quality. These regulations may influence the extent and methodology of soil disturbance allowed to occur on-site. However, since the intent of these regulations is primarily to protect hydrologic and biological resources, they are discussed in Chapter 6, Biological Resources, and Chapter 13, Hydrology and Water Quality.

State Regulations

Building Codes and Standards

Construction within the City is required to conform to the current version of the California Building Code (CBC) (California Building Standards Commission 2016), which is based on the International Building Code (IBC) (ICC 2015) used nationwide. The CBC incorporates the IBC and includes numerous more detailed and/or more stringent regulations to reflect conditions specific to the state of California. Where no other building codes apply, the IBC/CBC regulates excavation, foundations, and retaining walls, and regulates grading activities, including drainage and erosion control and construction on expansive soils.

In addition, Section 19100 et seq. of the California Health and Safety Code, State Earthquake Protection Law, requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific minimum seismic safety requirements are set forth in the IBC/CBC. The IBC/CBC identifies seismic factors that must be considered in structural design. It provides seismic design and construction standards applicable for designated seismic zones in California based on the seismic event with potential to occur in each zone.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act, codified in California Public Resources Code, Sections 2621–2630, prohibits construction of buildings used for human occupancy on the surface of active faults. This act also requires the State Geologist to establish regulatory zones, known as Earthquake Fault Zones, around the surface traces of active faults and to issue appropriate maps to be used by local agencies in regulating and planning construction. Earthquake fault zones are designated by the California Geological Survey and are delineated along traces of faults where mapping demonstrates surface fault rupture has occurred within the past 11,000 years. The project site is not included in an Alquist-Priolo Earthquake Fault zone (DOC 2010).

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act, codified in California Public Resources Code, Sections 2690–2699.6, requires the California Department of Conservation to identify Seismic Hazard Zones within the state based on the probable seismic shaking exposure and soil conditions in a given area. Areas that may be subject to substantial shaking, or where soil conditions indicate the area may be prone to liquefaction or earthquake-induced landslides, are included in Seismic Hazard Zones. There are no Seismic Hazard Zones mapped in Nevada County (DOC 2015).

Other State Regulations

Similar to the Clean Water Act discussed previously, the State Water Resources Control Board and California Department of Fish and Wildlife have developed standards and guidelines related to disturbance of hydrologic and biological resources. These standards and guidelines may influence the extent and methodology of soil disturbance allowed to occur on site. In particular, these agencies require the use of best management practices (BMPs) to control soil erosion from entering waterways. Because the intent of these standards and guidelines is primarily to protect hydrologic and biological resources, they are discussed in Chapter 6, Biological Resources, and in Chapter 13.

Consideration of paleontological resources is required by CEQA (see Appendix G in the CEQA Guidelines (14 CCR 15000 et seq.)). Other state requirements for paleontological resource management are found in California Public Resources Code, Chapter 1.7, Section 5097.5, Archaeological, Paleontological, and Historical Sites. This statute specifies that state agencies may undertake surveys, excavations, or other operations as necessary on state lands to preserve or record paleontological resources. This statute does not apply to the project because none of the property is state owned.

Local Regulations

Grass Valley General Plan

The Grass Valley 2020 General Plan Safety Element identifies goals (SG), objectives (SO), policies (SP) and implementation measures (SI) specifically related to the treatment of geologic and soil resources and safety considerations related to geology and seismicity. The following goal, objectives and policy are relevant to the proposed project:

1-SG: Reduce the potential risk of death, injury, property damage, and economic and social dislocation resulting from hazards.

1-SO: Assurance of high level of protection from geologic and seismic hazards for all residents, structures and vital services.

2-SO: Reduction of risk from exposure to hazards related to past and present mining, including shafts, tunnels, tailings and toxic materials.

4-SP: Based on location or probable need, require development plans in mined areas to include in-depth assessments of potential safety, including mine-related excavations, and health hazards and accompanying mitigation measures.

City of Grass Valley Grading Ordinance

The Grass Valley Grading Ordinance is detailed in Chapter 17.60 of the Grass Valley Development Code and establishes requirements for grading, erosion control, and stormwater management (City of Grass Valley 2007). Development projects must comply with these requirements during grading and construction. The primary goals of the Grading Ordinance are to establish standards in order to minimize hazards to life and property; protect against soil erosion, and the pollution of watercourses with nutrients, sediment, or other earthen materials; protect the safety, use and stability of public rights-of-way; protect fish and wildlife habitat; protect the scenic character and value of the City; and ensure that the intended use of a site for which a grading permit is sought complies with the General Plan and any specific plan.

The Grading Ordinance requires a grading permit for most projects within the City. Grading permit conditions are detailed in Section 17.60.050 of the Grass Valley Development Code. These conditions include requirements for control of dust, erosion, sediment and noise, and for mitigating adverse environmental impacts identified in any environmental review document. When issuing a grading permit, the City may impose any condition necessary to protect public health and welfare and avoid any hazardous conditions.

12.3 IMPACTS

Methods of Analysis

The project setting was developed based on a site-specific geotechnical evaluation by Holdrege & Kull conducted in 2007 (Appendix J-1), and by reviewing available geological documentation for the project area from the California Geological Survey, the US Geological Survey, the US Department of Agriculture, the City of Grass Valley General Plan 2020 and the General Plan EIR. The understanding of potential impacts resulting from the proposed project was based on analysis of these documents.

CEQA requires that the project be analyzed for potential impacts including exposing people or property to risk from seismic events or ground instability, resulting in soil erosion, resulting in the alteration of existing land forms, or destroying paleontological resources.

Significance Criteria

Potential impacts associated with soils, geology, and seismicity have been evaluated using the following criteria, based on Appendix G of the CEQA Guidelines. The proposed project would have a potentially significant impact related to geology, seismicity, and soils if it would:

- Expose people or structures to 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.
    - Strong seismic ground shaking.
    - Seismic-related failure including liquefaction.
- Be located on a geologic unit or soil that is unsuitable for the project, resulting in potential on-site or off-site landslide, lateral spreading, excessive expansion, subsidence, liquefaction or collapse.
- Result in substantial soil erosion or the loss of topsoil during construction activities and following completion of the proposed project.
- Result in substantial alterations to existing landforms.
- Directly or indirectly destroy paleontological resources.

Impact Analysis

Impact 12-1: Would the project result in exposure to potential substantial adverse effects involving rupture of a known earthquake fault, strong seismic ground shaking or seismic-related ground failure including liquefaction

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None Required	None Required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Both Alternative A and Alternative B would occur on the same project site and would be subject to the same seismic risks and conditions. The California Geological Survey designates the western portion of Nevada County as a low intensity zone for earthquake severity (DOC 2003). Further, neither Placer County nor Grass Valley is on the list of Cities and Counties affected by an Alquist-Priolo earthquake fault zone (DOC 2010). The project site is located in the Foothills Fault System, as described above, but there are no active faults that run directly beneath or near the project site.

The General Plan EIR concluded that it is unlikely a large magnitude earthquake would occur along this fault system given the recent studies, lack of recent movement, and lack of tectonic plate movement (City of Grass Valley 1999a). Therefore, risk of exposure to substantial adverse effects involving rupture of a known earthquake fault is **less than significant**.

The California Geological Survey maps those areas that may be subject to substantial shaking, or where soil conditions indicate the area may be prone to liquefaction; there are no Seismic Hazard Zones mapped in Nevada County (DOC 2015). Ground movement from earthquakes at an intermediate distance and from distant earthquakes could still be felt in Grass Valley. The USGS California Seismic Hazard Map indicates that the project site is located in an area with moderate potential to experience groundshaking resulting from seismic activity in the vicinity (USGS 2014). In regards to earthquake safety, the California Building Code, Title 24 (1616A and 1803A.6) provides minimum standards that prioritize safety and the reduction of life loss and injury. Therefore, compliance with the CBC, as required by City standards, would ensure that the potential for impacts to occur would remain **less than significant**.

Impact 12-2: Would the project be located on a geologic unit or soil that is unsuitable for the project?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None Required	None Required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Both Alternative A and Alternative B would occur on the same project site and would be subject to the same soil-related risks and conditions. Site topography is relatively flat to gently sloping, with elevations that range from 2,580 to 2,704 feet above MSL. According to the Preliminary Geotechnical Engineering Report completed for the project site, due to the presence of waste rock in the existing fill, it is likely not suitable to support structures on the project site (Appendix J-1). The Removal Action Work Plan (RAW, Appendix J-3A) dictates that 1,700 cubic yards of contaminated soil and mine waste should be removed from the project site and taken to a facility that is permitted to handle contaminated soil. The remaining approximately 64,000 yards of contaminated soil and mine waste located west of the former mill site would be buried, covered with 10 feet of clean soil and then capped with either the foundations of a building or parking lot. While saturated ground or seeps were not observed on the project site, the geotechnical report indicated that seepage would likely be encountered during the rainy season or in excavations that reveal the surface soil/weathered rock contact (Appendix J-1).

The geotechnical report recommends excavation and fill placement methods to ensure that fill replacing the contaminated soil and rock waste is adequate to handle the proposed structures.

Material used for fill construction would consist of uncontaminated, predominantly granular, non-expansive native soil. The geotechnical report recommends completion of a Design-Level Geotechnical Review which would evaluate deeper areas of existing fill to determine what approaches, such as fill replacement or the use of deep foundation systems, are appropriate.

Please refer to Chapter 15, Hazards and Hazardous Materials, specifically Impact 15-2, for a discussion regarding the hazards associated with naturally occurring asbestos. With oversight by the appropriate federal, state, and local agencies, and compliance with applicable regulations regarding hazardous materials, there would be limited potential for a reasonably foreseeable upset or accident associated with naturally occurring asbestos during remediation, construction, or operation.

Impact 12-3: Would the project result in substantial erosion or loss of topsoil during construction activities or following completion?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None Required	None Required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Both Alternative A and Alternative B would require substantial grading which has the potential to result in the loss of topsoil or increased erosion. The RAW (Appendix J-3A) prepared for the project site concluded that approximately 1,700 cubic yards contaminated soils and mine rock waste would be removed from the site and an additional 64,000 cubic yards would be buried on site. The majority of earthwork would be completed using conventional construction and trenching equipment. Areas of the site containing moderately or slightly weathered rock may be difficult to trench with conventional equipment and require special excavation techniques.

Both Alternatives are required to prepare a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the City's National Pollution Discharge Elimination System (NPDES) permit. Provisions of the SWPPP would require best management practices (BMPs) to control erosion and runoff, and are discussed further in Chapter 13. In addition, both Alternative A and Alternative B would be required to obtain a grading permit from the City and comply with the provisions of the Grading Ordinance. These provisions require compliance with City BMPs for erosion control including slope surface stabilization, use of plastic coverings, removal of off-site sediments, and installation of erosion control devices. Further recommendations are provided in the Preliminary Geotechnical Engineering report for erosion control on the graded portions of the site.

Therefore, preparation of a SWPPP, compliance with the NDPES permit, and receipt of a grading permit from the City, both Alternative A and Alternative B will have a less-than-significant impact.

Impact 12-4: Would the project substantially alter existing landforms?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Construction of either Alternative A or Alternative B would require substantial grading of the project site. Both alternatives would place similar amounts of development throughout the project site and would require similar grading and construction of retaining walls. The preliminary grading plan shows that up to 40 feet of cut is proposed in the central portion of the property and up to 60 feet of fill in the southwestern portion of the property. With the exclusion of soil removal as part of the hazard remediation plan discussed above, it is expected that the cuts and fills will balance. The project includes installation of multiple rock retaining walls along the perimeter of the project site ranging from two to six feet tall. These retaining walls would utilize rocks from the project site and be designed in accordance with the Grass Valley Design Guidelines and Development Code. Retaining walls would be constructed in the following locations: one wall along the southeastern edge of the project site just east of the detention basin; two walls west of the existing Spring Hill Drive extending to the western edge of the parking lot; three walls in the northwestern corner adjacent to the Dorsey Drive off-ramp; two walls along the norther border of the site west of the proposed entrance and exit along Dorsey Drive; one wall along the eastern border adjacent to pad four; and one wall along the eastern border from Pad 1 to Shop E.

Alteration of the site topography is an unavoidable result of development on the project site. Grading for building sites and dwelling units and excavations for drainage features and utility infrastructure would result in significant changes to the site's current condition. The City's Grading Ordinance prohibits mass grading and limits cuts and fills to the minimum amount necessary to provide stable embankments for required parking areas, street right-of-ways, structural foundations and adequate residential yards or outdoor areas incidental to a non-residential use. The ordinance also requires grading to be designed to maximize retention of natural landforms and features and have final elevations and contours that blend with adjacent natural terrain. The proposed grading plan would minimize changes in site topography and provide transitions between graded areas and adjacent properties as required by the City's Grading Ordinance. Impacts associated with alteration of existing topography would be **less than significant**.

Impact 12-5: Would the project directly or indirectly destroy paleontological resources?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially Significant	Potentially Significant
Mitigation measures:	Mitigation Measure 12a	Mitigation Measure 12a
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Alternative A and Alternative B would occur on the same project site, would involve similar amounts of grading, and therefore would pose the same risk for uncovering paleontological resources during construction. Although the project site is not known to contain any paleontological resources, construction would involve earth disturbing activities such as grading that have the potential to uncover previously unknown paleontological resources. The potential for a site to support paleontological resources depends on the location, topographic setting, and particular geologic formation in which a site is located. Fossils generally occur in the Sierra Nevada in rocks that are young in age (less than 50 million years old). According to the University of California, Museum of Paleontology, the closest fossil sites to the project site are a few miles to the east and north of the City of Grass Valley (City of Grass Valley 2011). The prior disturbance of the project site associated with operations of the Spring Hill Mine is likely to have including removal, disturbance, and/or destruction of any paleontological resources that were present at the site. However, there is a potential for paleontological resources to occur on site. Mitigation Measure 12a requires that site remediation and construction activities be halted in the event that paleontological resources are encountered, that the resources be evaluated by a qualified professional, and that data recovery or other resource management recommendations of the qualified professional are implemented. With implementation of Mitigation Measure 12a, both Alternative A and Alternative B would have a **less-than-significant** impact on paleontological resources.

Impact 12-6: Would the project make a considerable contribution to cumulative geology, soil, seismic, or paleontological impacts?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

A cumulatively considerable contribution to geologic, soil, seismicity, and paleontological impacts would result if the proposed project contributed an incremental increase in these effects that, when taken into account with concurrent projects, results in a significant net effect. The geographic context for the analysis of impacts resulting from geologic hazards and potentially unstable soils is generally site-specific, rather than cumulative in nature, because each project site has a different

set of geologic considerations that would be subject to uniform site development and construction standards. Other past, present, and reasonably foreseeable development in the area is described in Chapter 3, Land Use. It includes development of approximately 430 acres within the Town, which could contribute to soil erosion effects. However, all projects within the City are required to comply with the Municipal Code, which requires that grading occur subject to an erosion and sediment control plan and implementation of BMPs. Additionally, grading permits are issued by the City, which include conditions of approval requiring incorporation of measures necessary to ensure that geotechnical hazards, seismic hazards, and soil erosion is minimized during and following construction. These requirements of the Municipal Code would apply to all other development projects within the City, ensuring that potential cumulative impacts resulting from geological, seismic, and soil conditions would be reduced to less than significant on a site-by-site basis by modern construction methods and code requirements. As such, the potential for cumulative geotechnical hazards, soil conditions, and paleontological resources to affect on-site or off-site areas would be minimal, resulting in **less-than-significant** impacts.

12.4 MITIGATION MEASURES

Mitigation Measure 12a: If paleontological resources are encountered during site remediation or construction, work shall be halted within 100 feet of the resource and the construction contractor must notify the City of Grass Valley Community Development Department of the resource within 24 hours. The project applicant shall retain a qualified paleontologist to evaluate and record the resource and make recommendations for the appropriate treatment of the resource, in consultation with the City. Construction workers shall not collect paleontological resources. Appropriate treatment may include collection and processing of "standard" samples by a qualified paleontologist to recover micro vertebrate fossils; preparation of significant fossils to a reasonable point of identification; and depositing significant fossils in a museum repository for permanent curation and storage, together with an itemized inventory of the specimens.

12.5 REFERENCES CITED

California Building Standards Commission. 2013. *2013 California Building Code*. July 2013. Accessed May 4, 2016. Available at http://www.bsc.ca.gov/Home/Current2013Codes.aspx

California Health and Safety Code Section 19100

California Public Resources Code Chapter 1.7 Section 5079.50

City of Grass Valley. 1993. *City of Grass Valley General Plan Mineral Management Element*. Adopted August 24, 1993.

City of Grass Valley. 1999a. *City of Grass Valley 2020 General Plan*. Adopted November 1999.

City of Grass Valley. 1999b. *Grass Valley General Plan Update Environmental Impact Report*. Prepared for the City of Grass Valley by Quad Knopf. August 1999.

City of Grass Valley. 2007. "City of Grass Valley Municipal Code – Title 17 - Development Code Chapter 17.60 Grading Ordinance." March 6, 2007. Accessed May 4, 2016. Available at http://www.cityofgrassvalley.com/government/municipal-codes

City of Grass Valley. 2011. Draft Environmental Impact Report for the Proposed Grass Valley Redevelopment Plan Fourth Amendment. January 2011.

Department of Conservation California Geological Survey (CGS). 2003. "Map - Earthquake Shaking Potential for California." Spring 2003.

Department of Conservation CGS. 2010. "Table 4 - Cities and Counties Affected by Alquist-Priolo Earthquake Fault Zones as of January 2010." Accessed May 3, 2016.

Department of Conservation CGS. 2015. "Seismic Hazards Zonation Program – Northern California cities and counties affected by SHMP Zones." Last updated 2015. Accessed May 4, 2016. Available at

International Code Council (ICC). 2015. *2015 International Building Code*. Third printing October 2015. Available at http://codes.iccsafe.org/app/book/toc/2015/I-Codes/2015%20IBC%20HTML/index.html

Quad Knopf. 1998. *City of Grass Valley General Plan Update Background Report*. Prepared November 1998.

US Geological Survey. 2014. "USGS Earthquake Hazards Program California: California Seismic Hazard Map." 2014. Accessed May 6, 2016.

SOURCE: USDA 2016 & 2007

DUDEK

0 100 200 Feet

FIGURE 12-1

USDA Soils

Dorsey Marketplace EIR

CHAPTER 13
HYDROLOGY AND WATER QUALITY

This section evaluates impacts of the proposed Dorsey Marketplace (proposed project) in relation to drainage and water quality. The existing hydrology, water quality, and drainage of the project site are described, and associated regulatory requirements are identified and potential impacts evaluated. The potential for both localized and regional flooding to occur and emergency evaluation in the event of a regional flood event are also evaluated. The analysis considers two project alternatives. Alternative A would provide for up to 90 apartment units, approximately 178,960 square feet of commercial space, and a 3,200-square-foot clubhouse. Alternative B would provide 172~~1~~ apartments, approximately 104,350 square feet of commercial space, approximately 8,500 square feet of office space, and a 3,200-square-foot clubhouse.

Information referenced to prepare this section includes:

- *City of Grass Valley 2020 General Plan* (City of Grass Valley 1999a)
- *City of Grass Valley General Plan Update Environmental Impact Report* (City of Grass Valley 1999b)
- *Grass Valley General Plan Background Report* (Quad Knopf 1998)

Three comments related to hydrology, drainage, and water quality were received in response to the Notice of Preparation for this EIR. Caltrans requested the EIR's drainage study address potential downstream storm drainage impacts on Caltrans and City facilities. The Wolf Creek Community Alliance emphasized the importance of on-site stormwater retention and water quality measures, stating that the project is a few parcels uphill of the Wolf Creek riparian corridor. The CVRWQCB comment stated permitting requirements that may be applicable to the project. The Notice of Preparation and comment letters received in response to it are provided in Appendix A.

13.1 ENVIRONMENTAL SETTING

Regional Hydrologic Context

The City of Grass Valley, including the project site, is located within the Wolf Creek drainage basin in the Bear River Watershed. The Bear River Watershed covers an area of 300 square miles and is situated between two larger watersheds, the Yuba to the north and the American to the south. The average winter flows during the highest rainfall years is 3,400 to 5,600 cubic feet per second (cfs), in normal rainfall years is 600-800 cfs, and in the driest years is 20-65 cfs (Sacramento River Watershed Program 2016). The Bear River watershed is a part of the larger Sacramento River Hydrologic Region and the City also falls within the Mountain Counties Hydrologic region overlay zone (DWR 2011).

The south fork of the Wolf Creek and Little Wolf Creek drain the eastern and southern portion of the City and discharge into Wolf Creek in the central Grass Valley area (City of Grass Valley 1999a). Wolf Creek tributaries located within the City include French Ravine, Rhode Island Ravine, Slide Ravine, Murphy Hill, Matson Creek, South Fork Wolf Creek, Little Wolf Creek, Unnamed Ravine, Woodpecker Ravine and Olympia Creek.

The 26.8-acre project site generally slopes toward the south and southwest from a relatively flat-lying northern portion of the site, with elevations ranging from approximately 2,550 feet above mean sea level (MSL) in the southwestern portion to approximately 2,690 feet above MSL in the northern portion of the site. Drainage within the project site generally flows from north to south. Stormwater runoff from the site discharges in two main locations: an existing 24-inch pipe that carries runoff to the west and south generally along the route of State Route (SR) 20/49, and a rock lined swale that carries runoff to the east and south.

Groundwater

Regional Groundwater

The project site is within the Sacramento Hydrologic region and the Mountain Counties Hydrologic overlay zone (DWR 2011). In general, groundwater in this area is inadequate and unreliable because the fractured bedrock formations that compose much of the Sierra Nevada foothills and western slopes of the mountains are poorly suited to contain large quantities of groundwater (CABY 2014). Groundwater makes up only approximately 10 percent of the overall water supply in the Mountain Counties Hydrologic overlay area (CABY 2014). However, many rural homes, farms and ranches throughout this region rely on groundwater from individual wells.

Surface Water

Regional Surface Hydrology

The project site falls within the Wolf Creek drainage, which is part of the larger Bear River watershed. The Bear River originates about 20 miles west of the crest of the Sierra Nevada in northern Placer County and is fed by the Drum Canal from Spaulding Lake, which enters the river at the Drum Afterbay, a few miles downstream of the headwaters (Sacramento River Watershed Program 2016). The Middle Bear River flows out of the Drum Afterbay and enters Dutch Flat Reservoir. Bear River flows roughly parallel to Interstate 80 (I-80) and just before the river flows into Rollins Reservoir, it merges with Steephollow Creek, the largest tributary in the upper watershed. Bear River continues to flow southwest toward Lake Combie near the community of Meadow Vista. Wolf Creek drains southerly into Bear River, which heads continues west and enters into Camp Far West Reservoir, the largest water body in the Bear River Watershed. Eventually, the Bear River joins Feather River south of Yuba City and Marysville.

Project Site Surface Hydrology

The Preliminary Geotechnical Engineering Report (Appendix J-1) did not identify any areas of saturated ground or seeps on the project site. However, it is noted that seepage may be encountered in excavations that reveal the contact between relatively permeable surface soil and resistant volcanic rock.

Local Flooding

Grass Valley is located near the headwaters of Wolf Creek and its tributaries, which minimizes the quantity and velocity of stormwater flows through the City (City of Grass Valley 1999a). Future development upstream could increase the downstream flooding if appropriate mitigation measures are not applied. Flooding during the 100-year flood event is limited to a relatively narrow area along Wolf Creek and its tributaries. The Grass Valley flood damage protection ordinance (Chapter 15.52 of the Municipal Code) establishes construction standards for anchoring, materials, elevation and flood proofing of any structures building within the 100-year flood plain.

Regional Surface Water Quality

The project site is located in the Sacramento River Hydrologic region and within the Bear Creek watershed. Some areas of the Bear Creek watershed have been damaged by historic hydraulic mining and mercury contamination. Waterways within the watershed listed under CWA Section 303(d) as impaired bodies for mercury contamination include Upper Bear River, Steephollow Creek, Lake Combie, Wolf Creek, French Ravine, Camp Far West; Wolf Creek and French Ravine are listed for fecal coliform and bacteria, respectively (Sacramento River Watershed Program 2016). The South Fork American River is listed for mercury contamination from below Slab Creek Reservoir to Folsom Reservoir, and the Cosumnes River is listed in its entirety for aquatic exotic species (CABY 2014).

13.2 REGULATORY SETTING

Federal Regulations

Clean Water Act

The Clean Water Act (CWA) is a 1977 amendment to the Federal Water Pollution Control Act of 1972, which establishes the basic structure for regulating discharges of pollutants to waters of the United States. The objective of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Important sections of the act are as follows:

- CWA Sections 303 and 304 provide water quality standards, criteria, and guidelines. Under Section 303(d) of the CWA, California is required to develop a list of impaired water bodies

that do not meet water quality standards and objectives. California is required to establish Total Maximum Daily Loads (TMDLs) for each pollutant/stressor, which defines how much of a specific pollutant a give water body can tolerate and still meet relevant water quality standards.

- CWA Section 401 (Water Quality Certification) requires an applicant for any federal permit that proposes an activity, which may result in a discharge to waters of the United States, to obtain certification from the state that the discharge will comply with other provisions of the act.
- CWA Section 402 establishes the NPDES, a permitting system for the discharge of any pollution into the waters of the United States. This permit program is administered by the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). NPDES permits are described further below.
- CWA Section 404 establishes a permit program for the discharge of dredge and fill material into waters of the United States, which include stream courses and jurisdictional wetlands. This permit program is jointly administered by the U.S. ACOE and the EPA.

Numerous agencies have responsibilities for administration and enforcement of the CWA. At the federal level this includes the EPA, the U.S. ACOE, the Bureau of Reclamation, and the major federal land management agencies such as the U.S. Forest Service and the Bureau of Land Management. At the state level, the California EPA and its sub-agencies, including the SWRCB have been delegated primary responsibility for administering and enforcing the CWA in California.

NPDES Stormwater Discharge Permits

Surface water quality is regulated by NPDES, which was developed by the U.S. Environmental Protection Agency (EPA) in accordance with Section 303 of the CWA. In California, the SWRCB administers the NPDES program, with implementation and enforcement by each RWQCB. The NPDES program, designed to protect surface water quality, is applicable to all discharges to waters of the United States, including stormwater discharges associated with municipal drainage systems, construction activities, industrial operations, and "point sources" (such as wastewater treatment plant discharges and other direct discharges to water bodies). In April 2003, the SWRCB adopted an NPDES Phase II General Permit for the Discharge of Stormwater from small municipal separate storm sewer systems (MS4s) to provide NPDES permit coverage to municipalities that were not covered under the NPDES Phase I Rule for municipalities serving more than 100,000 people.

The Central Valley RWQCB issues NPDES permits for construction activities involving disturbance of 1 acre or more. The conditions of the state's General Permit for stormwater discharges associated with construction activities, Order Number 99-28-DWQ, require

development and implementation of a stormwater pollution prevention plan (SWPPP) that must address the following:

- Plans for implementation of structural and operational best management practices (BMPs) to prevent and control impacts to surface water during construction
- Inspection and maintenance of BMPs throughout all phases of construction
- Monitoring of runoff quality during all phases of construction
- A plan for preventing and controlling post-construction impacts to runoff quality

Federal Antidegradation Policy

The federal antidegradation policy is designed to protect water quality and water resources. The policy directs states to adopt a statewide policy that includes the following primary provisions: existing instream uses and the water quality necessary to protect those uses shall be maintained and protected; where existing water quality is better than necessary to support fishing and swimming conditions, that quality shall be maintained and protected unless the state finds that allowing lower water quality is necessary for important local economic or social development; and where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) is responsible for determining flood elevations based on available studies pursuant to the National Flood Insurance Program Final Rule (44 CFR 59, 61). FEMA is also responsible for developing the Flood Insurance Rate Maps, which are used in the National Flood Insurance Program (NFIP). Participation in the NFIP provides an opportunity for property owners in the community to purchase flood insurance, provided that the community complies with FEMA requirements for maintaining flood protection and managing development in the floodplain.

State Regulations

The Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Water Quality Control Act (Porter-Cologne) is the principal law governing water quality regulation in California. This statute established the SWRCB and the nine RWQCBs, which are charged with implementing its provisions. Porter-Cologne establishes a comprehensive program for the protection of water quality and the beneficial uses of water. It applies to surface waters, wetlands, and groundwater and to both point and non-point sources. Porter-Cologne is

found in California Water Code, Section 13000. In addition, California Code of Regulations, Title 23, contains administrative and regulatory elements of water quality and quantity management in California.

The SWRCB allocates rights to the use of surface water and, with the nine RWQCBs, protects water quality in all waters of the state. The SWRCB provides program guidance and oversight, allocates funds, and reviews RWQCB decisions. The RWQCBs are responsible for individual permitting, inspection, and enforcement actions within the nine hydrologic regions. The project site is located within Region 5, the Central Valley River Basin RWQCB.

The act requires a "Report of Waste Discharge" for any discharge of waste to land or surface waters that may impair a beneficial use of surface or groundwater of the state. California Water Code Section 13260 (a) requires that any person discharging waste or proposing to discharge waste that could affect the quality of the waters of the state, to file a Report of Waste Discharge with the applicable RWQCB. For discharges directly to surface waters an NPDES permit is required, which is issued under both state and federal law; while for other discharges to waters of the state (such as groundwater and isolated wetlands), Waste Discharge Requirements (WDRs) are required and are issued exclusively under state law. WDRs typically require many of the same best management practices (BMPs) and pollution control technologies as required by NPDES-derived permits.

Basin Planning

The SWRCB and its nine RWQCBs are responsible for administering and enforcing statutes for the protection and enhancement of water quality, including the Porter-Cologne Act and portions of the CWA. The SWRCB provides state-level coordination of the water quality control program by establishing statewide policies and plans for implementation of state and federal regulations. The nine RWQCBs throughout California adopt and implement Basin Plans that recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality problems.

The *Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley* designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed throughout the plan (CVRWQCB 2015). The NPDES and WDR programs regulate construction, municipal, and industrial stormwater and non-stormwater discharges under the requirements of the CWA and the Porter-Cologne Act. The construction stormwater program and the statewide general permit for low-threat discharges are administered by the SWRCB, while the municipal stormwater program is administered by the CVRWQCB. The Basin Plan designates beneficial uses for the Bear River into which the City's stormwater eventually drains via Wolf Creek. Designated uses include water supply, irrigation, stock watering, power, contact recreation, non-contact recreation, warm water habitat and cold water habitat (CVRWQCB 2015).

To comply with the NPDES General Permit for Stormwater Discharges Associated with Construction Activities, project applicants must prepare a Stormwater Pollution Prevention Plan (SWPPP) for review by the Central Valley RWQCB. The SWPPP would include the following four major elements:

1. Identify pollutant sources, including sources of sediment, which may affect the quality of stormwater discharges from the construction site.
2. Identify non-stormwater discharges.
3. Identify, construct, implement in accordance with a time schedule, and maintain BMPs to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the construction site during construction.
4. Identify, construct, implement in accordance with a time schedule, and assign maintenance responsibilities for post-construction BMPs to be installed during construction that are intended to reduce or eliminate pollutants after construction is completed.

State ~~Nondegradation~~ Antidegradation Policy

As required under the federal antidegradation policy, described above, in 1968 the SWRCB adopted a ~~nondegradation~~ antidegradation policy aimed at maintaining high quality for waters of California. The ~~nondegradation~~ antidegradation policy states that the disposal of wastes into state waters shall be regulated to achieve the highest water quality consistent with maximum benefit to the people of the state and to promote the peace, health, safety and welfare of the people of the state. The policy provides the following:

- Where the existing quality of water is better than required under existing water quality control plans, such water quality would be maintained until it has been demonstrated that any change would be consistent with maximum benefit to the people of the state and would not unreasonably affect present and anticipated beneficial uses of such waters.
- Any activity which produces waste or increases the volume or concentration of waste and which discharges to existing high-quality waters would be required to meet waste discharge requirements, which would ensure pollution or nuisance would not occur and the highest water quality consistent with the maximum benefit to the people of the state would be maintained.

Local Regulations

City of Grass Valley Stormwater Management Program

The City's Stormwater Management Program (SWMP) was completed in 2003 to comply with the statewide general permit (Small MS4 General Permit) for discharging stormwater in waters of the

United States. The SWMP contains six elements: public education and outreach, public involvement and participation, illicit discharge, construction activities, new development and redevelopment, and municipal operations. The SWMP is designed to eliminate discharges of non-stormwater from illicit connections and illegal dumping; reduce stormwater associated with construction activities and new development or redevelopment; reduce stormwater associated with municipal activities conducted in public rights of ways, open spaces and at publicly operated facilities.

City of Grass Valley Grading Ordinance

The City Grading Ordinance (Title 17, Article 6, Chapter 17.60/17.62 of the City Code) sets forth rules and regulations to prevent and control dust, control land disturbances, and reduce pollution, erosion and sedimentation resulting from construction activities. A dust prevention and control plan is required to be submitted along with a grading plan for review and approval by the City Engineer. The ordinance also specifies best management practices (BMPs) to be implemented at all times during construction and final erosion controls measures to be implemented within 30 days after completion of grading and no later than October 15th (City of Grass Valley 2007).

City of Grass Valley General Plan

The following Grass Valley 2020 General Plan goals (G), objectives (O) and policies (P) from the Conservation and Open Space (COS) elements are applicable to the proposed project and relate to stormwater drainage, water quality, and flood hazards.

2-COSG: Protect, enhance, and restore hydrologic features, including stream corridors, flood plains, wetlands, and riparian zones.

8-COSO: Minimize interference with the natural functions of flood plains and naturally flood-prone areas.

6-COSG: Assure compliance with and understanding of air and water quality regulations and standards.

15-COSO: Protection of ground- and surface water quality.

16-COSO: Inclusion of air and water quality considerations in land use decisions rendered by the Planning Commission and City Council.

6-COSP: Prevent excessive alteration of natural topography.

9-COSP: Carefully regulate development for location in flood hazard areas.

13.3 IMPACTS

Methods of Analysis

An Autodesk Storm and Sanitary Sewer Analysis was prepared for the project site by Genesis Engineering in 2014 (Appendix K) to estimate existing runoff and proposed project runoff, and to identify drainage facilities that would be needed to meet the current City standards. This impact analysis incorporates the results of that study to identify potential proposed project impacts associated with drainage and post-construction water quality.

Significance Criteria

Based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), potentially significant impacts associated with hydrology and water quality from implementation of the proposed project, including construction and operation phases, have been evaluated with respect to the following significance criteria. Would the project:

- Substantially degrade surface or groundwater quality (i.e., during construction or operation)?
- Cause a substantial increase in rate or volume of runoff leaving the site that would exceed the capacity of existing or planned stormwater drainage systems and result in flooding?
- Expose people or structures, on- or off-site, to a significant hazard of flooding as a result of placing development within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?
- Substantially decrease groundwater recharge, resulting in depressed groundwater levels in the local and/or regional area?

Impact Analysis

Impact 13-1: Would the project substantially degrade surface or groundwater quality?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Project Construction Effects on Surface Water Quality

As described in Chapter 6, Biological Resources, the southwestern portion of the project site supports an intermittent drainage and a seasonal wetland (Appendix E). These features are presumed to be federally protected wetlands (under the Clean Water Act) because they flow into an existing City

storm drain located under Spring Hill Drive, which outflows to Wolf Creek. In addition, both features are considered waters of the state under the jurisdiction of the RWQCB under Section 401 of the Clean Water Act and the Porter-Cologne Act.

Project construction activities would be similar under both Alternative A and Alternative B. They would involve remediation of the contaminated soil on site, vegetation removal, grading, building construction, and paving. The project proposes to alter the natural grade, create a stormwater detention basin, and construct retaining walls and parking lots in this portion of the project site. These elements of the project would require the removal of the majority of the seasonal wetland and intermittent drainage from the project site. Without implementation of appropriate control measures, grading and excavation associated with soil remediation as well as grading involved in preparing the project site for construction would decrease vegetative cover, require discharge of fill material to waters of the US and waters of the state, and potentially increase the rate and quantity of stormwater runoff to downstream locations. This would result in accelerated soil erosion and sediment delivery to the on-site waterway and off-site areas. This could increase the amount of suspended solids in local waterways and contribute to elevated turbidity in portions of the Bear River watershed downstream of the project site. Additionally, leaks or upset of fuel or hydraulic fluid used in construction equipment and outdoor storage of construction materials or spills of paints, solvents, or other potentially hazardous materials commonly used in construction could degrade stormwater runoff quality during construction. Small leaks from construction equipment and building materials would not be expected to result in contamination of groundwater, as they would be likely to break down or dilute in the shallow soil layer and be conveyed to surface water runoff. Large quantities of hazardous materials would be required to be stored in compliance with applicable regulations to prevent or contain any spills. Chapter 15, Hazards and Hazardous Materials, provides further discussion regarding hazardous materials use and storage and the potential for accidental release of hazardous materials.

Pursuant to the requirements of the City's Grading Ordinance (Municipal Code 12.06.120), all construction plans and applications for building permits and grading permits shall consider the potential for erosion and sedimentation at the construction site, and shall include appropriate erosion and sedimentation controls. Appropriate controls shall be determined in accordance with the guidance provided in the California Stormwater Quality Association (CASQA) Stormwater Best Management Practice Handbook and city improvement standards and may include site planning considerations, construction staging and timing, and installation of temporary detention ponds or other treatment facilities.

Additionally, prior to issuance of a grading permit, the applicant would be required to demonstrate coverage for project activities under the SWRCB's NPDES General Permit for Stormwater Discharges Associated with Construction Activities. To obtain coverage under the permit, the project applicant would submit a Notice of Intent with the required permit fee and prepare a

SWPPP for review by the Central Valley RWQCB. The project would also be required to obtain a Clean Water Action Section 404 permit and Section 401 Water Quality Certification, as discussed in Chapter 6, Biological Resources; as well as a Waste Discharge Requirement permit under the Porter Cologne Act.

In addition, dischargers are also required to inspect construction sites before and after storms to identify stormwater discharge from construction activity, and to identify and implement controls where necessary. Typical BMPs that would be appropriate to implement at the project site may include scheduling or limiting activities to certain times of year, implementing dust control procedures throughout the project area, stabilizing cut and fill slopes as soon as possible, controlling erosion through a variety of means such as mulch and compost blankets, riprap, and installation of sediment retention structures (such as a sediment retention basin), sediment control with the use of measures such as storm drain inlet protection, vegetated buffers, fiber rolls and berms, sediment fencing, and straw or hay bales.

Other temporary BMPs would ensure "good housekeeping" at the project site during construction. These would include cleaning construction equipment and preventing the leakage of fluids, storing materials away from surface water, protecting sensitive areas with sediment barriers or other containment methods, controlling laying of concrete and washing of related equipment, and collecting debris and gravel associated with paving operations. Adequate temporary storm drainage controls would be provided, including on-site drainage containment, the placement of silt fences around construction areas, and constructing temporary sediment basins (as necessary).

Compliance with the City's Grading Ordinance and implementation of the provisions contained in the SWPPP approved by the RWQCB would ensure that potential impacts to water quality due to construction activities would be **less than significant** because all appropriate and necessary BMPs would be implemented to avoid or minimize the discharge of pollutants and sediment to surface water.

Project Operation Effects on Surface Water Quality

Alternative A and Alternative B would result in similar site conditions, including the amount of impervious surfaces introduced to the project site, following construction. According to the preliminary drainage report prepared by Genesis Engineering (Appendix K), the overall amount of impervious land cover would increase up to approximately 75%. This increase in the overall area of impervious surface on the site would increase both the volume and rate of runoff from the site, as less water would infiltrate the soil. Human activities on site would also generate typical urban pollutants (automobile pollutants, chemicals from landscape and structural maintenance, soil erosion, and solid waste). These pollutants accumulate on impervious surfaces during dry weather and are then transported by surface flows into drainageways during storm events. Stormwater runoff

from streets and driveways would be expected to contain oils, grease, sediment, and other urban debris and to have potential to result in degradation of surface water quality in area drainage ways.

Under either alternative, the project would include a combination of Low-Impact Development (LID) and BMPs to minimize pollutants entering the drainage system and being discharged from the site. This would be accomplished through a combination of "good housekeeping" practices and mechanical and biological treatment facilities. Both Alternative A and Alternative B incorporate grassy swales, detention basins, detached downspouts, and landscape strips all to promote infiltration of stormwater and to reduce the volume of runoff reaching the drainage system. Proper signage and inlet makings would also be incorporated to inform residents and visitors that all drains flow to the creeks and dumping, or disposal of waste in the drains is not allowed. In addition, treatment BMPs would be installed to ensure that all new impervious area would have some form of water quality treatment prior to discharge. These include bioretention basins, vegetative swales, flow-through planters, and hydrodynamic separators. The BMPs would be sized in accordance with the current local and state guidelines, including the California Stormwater Quality Association manual.

The BMP plan would be consistent with the NPDES requirements as discussed in Section 13.2, Regulatory Setting. To comply with the NPDES requirements, the project must implement a BMP plan that ensures the project would not cause or contribute to an exceedance of water quality standards contained in any Statewide Water Quality Control Plan, the California Toxics Rule, or the Water Quality Control Plan for the Sacramento River and the San Joaquin River Basins. With compliance with the NPDES requirements, under either Alternative A or Alternative B the project's impacts related to degradation of surface water quality would be **less than significant.**

Project Effects on Groundwater Quality

Construction of either Alternative A or Alternative B would proceed according to the Construction SWPPP required under the statewide construction general permit. The SWPPP would require construction to adhere to BMPs as listed previously that would minimize potential impacts to groundwater quality from construction. The greatest potential for impacts to groundwater quality to occur during project operation would be due to specific land uses that may store or transport hazardous materials. Project operation is not anticipated to result in the use or transport of substantial quantities of hazardous materials with the potential to result in groundwater contamination. Further discussion of potential impacts associated with use or transport of hazardous materials is provided in Chapter 15 of this EIR.

Under either alternative, the project would tie into the sewer system, and would therefore result in no impacts to groundwater as a result of septic tank failure or high groundwater septic system interaction.

The LID techniques and BMPs implemented under either alternative would ensure that surface water quality is maintained, and would reduce the potential for impacts to groundwater to occur as a result of pollutants delivered in stormwater runoff. Some groundwater recharge may occur when stormwater runoff is captured in the proposed detention basins. The project proposes to construct a stepped detention basin with 12 inches of crushed rock and 4-inch diameter perforated pipe to allow drawdown and standing water in the ponds to meet LID requirements and control drainage from the western portion of the project site. The eastern portion of the site would detain runoff with underground storage pipes and a shallow rock-lined pond with a separation system to meet LID requirements (Appendix K). With these features, the project would meet post-construction runoff and LID requirements so the water within the detention basin would not impair local groundwater quality. Thus, impacts to surface and groundwater quality would be **less than significant**.

Impact 13-2: Would the project cause a substantial increase in rate or volume of runoff leaving the site that would exceed the capacity of existing or planned stormwater drainage systems and result in flooding?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Development of roads, buildings, and other paved and impermeable surfaces would reduce the amount of stormwater that currently infiltrates into the ground and could increase the volume and rate of runoff leaving the project site, as discussed under Impact 3.13-1, if appropriate measures are not implemented to control peak flows. A significant impact would occur if post-development stormwater runoff rates are not reduced to levels below the pre-development runoff rates. However, the City requires that the project include a stormwater management plan that provides for sufficient onsite stormwater storage to ensure that runoff rates during the 2-year, 10-year, and 100-year storm do not increase compared to the existing condition.

The proposed stormwater management plan under either Alternative A or Alternative B includes three drainage management areas: the first is a 0.54 acre-feet storage basin in the west portion of the site; the second is a 1.49 acre-feet storage basin; the third is a 0.4 acre-feet storage basin. The first two would drain into extended detention basin while the last would drain into a CDS separation and underground water storage pipes.

Genesis Engineering used the SCS method to determine the increased runoff potential of the development. The SCS method is the Runoff Curve Method developed by the US Department of Agriculture Soil Conservation Service and estimates rainfall excess (runoff) from rainfall. Using the rain depth from the Rain Gage Station GRASS VALLEY 2 NNE (station number A60 3572

00), Genesis determined that the main CN value should be 0.95 with 75% impervious with a Type 1A SCS storm curve.

According to the preliminary Post Construction Design and LID requirement calculations (Appendix K), the first storage area will require 0.31 acre-feet of storage of the 0.54 allocated. The second will require 0.32 acre-feet of storage, far less than the allocated 1.49. Lastly, the third will fill 0.13 acre-feet of the 0.4 allocated. Because the storage areas provide more capacity than the minimum requirement, the proposed stormwater management measures would be sufficient to ensure that the project does not increase stormwater runoff rates from the project site. Therefore, under either alternative, the project's potential to cause a substantial increase in rate or volume of runoff leaving the site that would exceed the capacity of existing or planned stormwater drainage systems and result in flooding is **less than significant**.

Impact 13-3: Would the project expose people or structures to a significant hazard of flooding as a result of placing development within a 100-year flood hazard area?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Both Alternative A and Alternative B would develop the same project site and place structures in the same general locations throughout the site. The City of Grass Valley 2020 General Plan states that the City is relatively well drained and the only areas susceptible to flooding during the 100-year flood event are limited to areas along Wolf Creek and its tributaries. The project site is not within this narrow band. This is confirmed by the Federal Emergency Management Agency (FEMA) map 06057C0631E. Where storm drains and culverts are not maintained and kept clear, localized flooding may occur; this is preventable, temporary, and unlikely to be significant. Flooding risks associated with dam failure in this location are extremely low.

Per the City's General Plan, the only dam capable of inundating any portion of the Grass Valley Planning Area in event of failure is the Scotts Flat Lake Dam operated by NID. Inundation as a result of dam failure would most likely be caused by an earthquake. However, the area of Nevada County in which these dams exist is not located within an historical seismic zone, and is within the lowest earthquake intensity zone in California. Overall, both Alternatives will have a **less-than-significant** impact on the exposure of people or structures to a significant hazard of flooding as a result of placing development within a 100-year flood hazard area.

Impact 13-4: Would the project substantially decrease groundwater recharge, resulting in depressed groundwater levels in the local and/or regional area?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	No impact	No impact
Mitigation measures:	None required	None required
Significance after mitigation:	No impact	No impact

Alternative A and Alternative B

Domestic water service to the project site and surrounding residential development is provided by the ~~City of Grass Valley~~Nevada Irrigation District. The proposed project site includes no on-site groundwater extraction to supply water demands of the project. Provision of water supplies is evaluated in further detail in Chapter 14, Public Services and Utilities.

Both Alternative A and Alternative B would increase the amount of impervious surfaces by roughly the same amount by developing roads, driveways, buildings, and hardscape landscaping. This increase in the overall area of impervious surface on the site would reduce the amount of infiltration of surface water to the near surface soils. According to the California Department of Water Resources, the project site is located approximately 20 miles east of the North American subbasin of the Sacramento Valley Groundwater Basin, which covers 351,000 acres (548 square miles between the Bear River in the north, the Feather River in the west, and the Sacramento River in the south). Thus, no recharge of the groundwater basin occurs directly from the project site.

Both Alternative A and Alternative B would have no effect on infiltration patterns within the groundwater basin. As discussed in Impact 13-2, both Alternatives would implement BMPs and stormwater detention to ensure that post-development stormwater flows are reduced such that they do not exceed the pre-development flow rates; however, the total volume of stormwater discharge from the site would not be reduced. Therefore, Alternative A and Alternative B would have **no impact** to groundwater supply or recharge.

Impact 13-5: Would project construction and operation contribute to cumulative violations of water quality standards and/or waste discharge requirements?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None	None
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

The geographic area for consideration of cumulative water quality impacts is the City of Grass Valley, and the cumulative development scenario includes buildout of the City of Grass Valley General Plan and the list of approved and proposed projects within the City, as summarized in

Chapter 3, Land Use. Future development within the City could result in development of undeveloped land that could lead to potential increases in polluted runoff to local surface waters. However, all future development, similar to both Alternative A and Alternative B, would be subject to the NPDES MS4 permit and would be required to comply with BMPs in the City of Grass Valley Stormwater Management Plan; LID measures to reduce pollutants; the City's Grading Ordinance (Municipal Code, Chapter 12.04 12.06.120); General Plan policies related to hydrology and water quality; and the General Construction NPDES permit. New development and redevelopment projects would require implementation of plans that identify and implement a variety of BMPs to reduce the potential for erosion or sedimentation. Compliance with these regulations would ensure that each development in the cumulative scenario would not cause an increase in stormwater runoff rates or volumes and would not introduce new sources of surface water and groundwater pollution. Therefore, the cumulative impacts to water quality would be **less than significant**, and there would be no significant cumulative impact to which either Alternative could contribute.

13.4 MITIGATION MEASURES

No mitigation measures are required.

13.5 REFERENCES CITED

California Department of Water Resources (DWR). 2011. "Hydrologic Regions and Overlay Areas of Interest Map." Prepared by Scott Hayes. January 4, 2011.

Central Valley Regional Water Quality Control Board (CVRWQCB). 2015. *Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley.* April 16, 2015.

City of Grass Valley. 1991. "City of Grass Valley Municipal Code Title 15 Buildings and Construction, Chapter 15.52 Flood Damage Prevention." 1991. Accessed June 7, 2016. Available at https://www2.municode.com/library/ca/grass_valley/codes/code_of_ordinances?nodeId=15036

City of Grass Valley. 1999a. *City of Grass Valley 2020 General Plan*. Adopted November 1999.

City of Grass Valley. 1999b. *City of Grass Valley General Plan Update Environmental Impact Report*. Prepared for the City of Grass Valley by Quad Knopf. August 1999.

City of Grass Valley. 2003. *City of Grass Valley Stormwater Management Program Planning Document*. October 2003.

City of Grass Valley. 2007. "Development Code Title 17, Article 6, Chapter 17.60/17.62 Grading Ordinance." March 6, 2007. Accessed June 7, 2016. Available at http://www.cityofgrassvalley.com/document-central/development-code

Quad Knopf. 1998. *Grass Valley General Plan Background Report.* November 1998.

Sacramento River Watershed Program. 2016. "Bear River Watershed." Accessed June 7, 2016. Available at http://www.sacriver.org/aboutwatershed/roadmap/watersheds/american/bear-river-watershed

CHAPTER 14
PUBLIC SERVICES AND UTILITIES

This chapter addresses public services and utilities required to serve the proposed Dorsey Marketplace (proposed project). These services and utilities include water supply, treatment, and conveyance; wastewater treatment and conveyance; electricity, gas, and communication utilities; parks and recreational facilities; schools; fire protection; law enforcement; solid waste disposal and library services.

The Notice of Preparation and comments received in response to it are provided in Appendix A.

Information referenced to prepare this section includes:

- *City of Grass Valley 2020 General Plan* (City of Grass Valley 1999a)
- *City of Grass Valley General Plan Update Environmental Impact Report* (City of Grass Valley 1999b)
- *Grass Valley General Plan Background Report* (Quad Knopf 1998)
- *Grass Valley Wastewater Master Plan (Stantec 2016)*
- *Sewer Capacity Analysis* (Appendix L)

14.1 ENVIRONMENTAL SETTING

Water Supply

Raw and treated water supply in the project region is provided by the Nevada Irrigation District (NID). NID sells raw and treated water to the City of Grass Valley, Nevada City, Bitney Springs LLC, Lake Vera Mutual, and Placer County Water Agency (for customers in Lincoln). NID's raw agricultural water demands include water use for crops, environmental uses, and recreational water uses (Brown and Caldwell 2016). NID serves agricultural, raw and treated water to more than 24,500 customers (Nevada LAFCO 2015).

The City of Grass Valley purchases raw water from NID for treatment and distribution. The City's water treatment system servesprovides approximately 60% of the treated water provided to customers in the incorporated City, with 2,600 water connections. The Nevada Irrigation District (NID) directly serves provides the remaining 40% of the customers in the City, in the to outlying portions of the City between the City's water service area and the Planning Area boundary (Nevada LAFCO 2015). The Dorsey Marketplace project site is within the NID service area (City of Grass Valley 2011). NID serves agricultural, raw and treated water to more than 24,500 customers. (Nevada LAFCO 2015)

~~The proposed project site is located outside of the Grass Valley service area, and is within the NID service area.~~ Existing NID pipelines surround the project site to the north, south, and east. They run along Dorsey Drive, Idaho Maryland Road, Spring Hill Drive, Golden Gate Terrace, and Sutton Way (Stantec 2016).

NID's service area encompasses 287,000 acres and covers portions of three counties: Nevada, Placer, and Yuba. All of NID's customers are metered and consist of single family and multi-family residential connections, and commercial, industrial, institutional, and landscape non-residential connections. NID sells raw and treated water to the Cities of Grass Valley and Nevada City, Bitney Springs LLC, Lake Vera Mutual, and Placer County Water Agency (PCWA). NID's watershed is located on the upper reaches of the Yuba River, Bear River, and Deer Creek. Water management facilities include 10 storage reservoirs, 6~~8~~ treatment plants, and 425 miles of pipeline, canals and other conveyance facilities. NID also owns and operates five hydroelectric power plants. Power from the plants is sold to Pacific Gas and Electric Company that supplies power to an estimated 85,000 residences (Brown and Caldwell 2016, Appendix K). NID supplies water to approximately 6,000 agricultural customers with an average total reported irrigated acreage of 25,860 acres (Brown and Caldwell 2016). The City of Grass Valley operates one water treatment plant and operates and maintains the water infrastructure system within the portions of the City that are not directly served by NID.

NID water is provided by four sources: water from the watershed, carry-over storage, contract purchases, and recycled water (Kleinschmidt 2011). However, NID's primary source of water is local surface water obtained from the Yuba River, Bear River, and Deer Creek watersheds that is diverted and stored under NID's appropriative water rights. NID does not use groundwater as an existing or planned source of water supply due to limited groundwater availability. NID's water rights allow for a diversion of 450,000 acre-feet. The District has an extensive system of storage reservoirs that provides surface water supply to the District's six~~seven~~ water treatment plants as well as to the raw water customers.

NID's water supply is dependent on snowmelt and rain to fill storage reservoirs. While there may be limited natural runoff during normal summer months, the irrigation season (April 15–October 14) demand is met primarily with withdrawals from storage reservoirs.

In 2015 NID supplied 126,653 acre/feet/year (AFY) of water to its customers (Brown and Caldwell 2016, p. 3-2). Water use in the Nevada Irrigation District declined ~~more than 20~~by approximately 18% between 2013 and ~~2017~~ 2018 (~~Southern California Public Radio 2017~~NID 2019). NID projecteds the minimum water supply (reflecting dry year conditions) ~~available~~ for 2016, 2017, and 2018 estimated based on combined availability of all water sources to be 233,225 AFY (2016), 253,185 AFY (2017), and 202,611 AFY (2018) (Brown and Caldwell 2016, p.7-6). Beyond that, NID projects a reasonably available volume of 360,800 AFY in normal water ~~/~~years from 2020 to 2040, with excess water after projected demands, as shown in ~~the table below~~Table 14-1. However,

as shown in Table 14-2, NID water supply would be reduced in single dry and multiple dry years to a low of 202,611 AFY. This would result in a projected shortage of up to 469 AFY in year 2035 and 6,910 AFY in year 2040 under the single dry and multiple dry year scenarios.

Table 14-1
Projected Water Supply Sources 2020-2040
(Acre Feet per Water Year)

Source	Projected Water Supplies in Normal Years									
	2020		2025		2030		2035		2040	
	Reasonably available volume	*Total right or safe yield*	*Reasonably available volume*	*Total right or safe yield*	*Reasonably available volume*	*Total right or safe yield*	*Reasonably available volume*	*Total right or safe yield*	*Reasonably available volume*	*Total right or safe yield*
Watershed Runoff	221,500	221,500	221,500	221,500	221,500	221,500	221,500	221,500	221,500	221,500
Carryover Storage	129,400	201,985	129,400	201,985	129,400	201,985	129,400	201,985	129,400	201,985
Contract Purchase (PG&E)	8,000	54,361	8,000	54,361	8,000	54,361	8,000	54,361	8,000	54,361
Recycled water	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900
Supply Total	**360,800**	**479,746**	**360,800**	**479,746**	**360,800**	**479,746**	**360,800**	**479,746**	**360,800**	**479,746**
Demand Total	**178,919**		**187,960**		**196,076**		**203,080**		**209,521**	
Difference (supply minus demand)	**181,881**		**172,840**		**164,724**		**157,720**		**151,279**	

Source: Brown and Caldwell 2016

NID also currently receives recycled water from the City's wastewater treatment plant. The City's discharges tertiary treated wastewater into Wolf Creek and in 2015 discharged 2,230 acre-feet of water. All wastewater treated within the NID service area is discharged to local natural watercourses. Recycled water mixes with NID water being transported in those watercourses. This supply of water augments NID's overall water supply. However, NID uses recycled water exclusively for agricultural uses (Brown and Caldwell 2016).

Table 14-2
Projected Single Dry Year and Multiple Dry Year Water Supply 2020-2040
(Acre Feet per Water Year)

Year	Demand	Multiple Dry, 1st Year		Multiple Dry 2nd Year		Multiple Dry 3rd Year		Multiple Dry 4th Year and Single Dry	
		Supply	Difference	Supply	Difference	Supply	Difference	Supply	Difference
2020	178,918	368,161	189,242	233,225	54,306	253,185	74,266	202,611	23,692
2025	187,960		180,201		45,265		65,225		14,651
2030	196,076		172,085		37,149		57,109		6,535
2035	203,080		165,081		30,145		50,105		-469
2040	209,521		158,640		23,704		43,664		-6,910

Source: Brown and Caldwell 2016

~~According to NID's 2015 Urban Water Management Plan, in 2015 they provided 24 AFY of treated water and 917 AFY of raw water to the City (Brown and Caldwell 2016). Table 14-21 provides NID's estimated projected increase in water demand in five-year increments through 2040.~~

~~**Table 14-2**~~
~~**NID Projected Increase in Water Demand**~~

	~~2020~~	~~2025~~	~~2030~~	~~2035~~	~~2040~~
~~Treated Water~~	~~50~~	~~50~~	~~50~~	~~50~~	~~50~~
~~Raw Water~~	~~1,300~~	~~1,300~~	~~1,350~~	~~1,350~~	~~1,350~~

~~**Note:** All amounts are in acre/feet/year.~~
~~**Source:** Brown and Caldwell 2016~~

The NID UWMP also contains a section entitled ~~has a Drought~~ Water Shortage Contingency Planning that ~~provides~~ identifies specific strategies and guidance ~~to~~ for NID staff and customers to reduce water demand in low water years, which ~~help~~ would minimize ~~drought or~~ water supply shortages ~~impacts~~. Section 4 of the UWMP notes the effectiveness of the water demand reduction measures taken during the recent drought, with a more than 30% reduction from the target per capita water usage during 2015. The Water Shortage Contingency Planning section of the UWMP ~~plan~~ identifies drought action levels, appropriate agency responses, water demand reduction goals, and provides recommended demand management measures to assist customers in water conservation.

Surface Water

The City of Grass Valley lies within two drainage basins. The southern majority of the City lies within the Wolf Creek drainage basin. The northern portion of the City, including lands within the Planning Area, lies within the Deer Creek basin. Northwestern and western areas are within the

upper reaches of the Deer Creek drainage basin, but do not include Deer Creek or substantial tributaries. The South Fork of Wolf Creek and Little Wolf Creek drain the eastern and southeastern portion of the Planning Area and discharge into Wolf Creek in the central Grass Valley area. The Wolf Creek basin is approximately 20 square miles and intersects Grass Valley from the northeast to southwest and is a tributary of both the Bear and Sacramento Rivers.

Groundwater

The City and NID do not rely on groundwater due to its limited availability.

Wastewater Conveyance and Treatment

The Grass Valley Wastewater Treatment plant (WWTP) is located at 556 Freeman Lane. The plant encompasses 29 acres and was built in 1950 and expanded in 2000. The City currently collects and treats wastewater from an area of approximately 2,430 acres (equating to a service area of approximately 4.1 square miles), serving a population of approximately 12,668 people, as well as a number of industrial and commercial users (Stantec 2016). The WWTP is a nitrification/denitrification activated sludge treatment system with advanced tertiary treatment facilities. The plant is comprised of a headworks (screening and grit removal) with odor control, primary treatment (primary clarifiers), and secondary treatment (aeration basin and secondary clarifier). Secondary effluent is filtered and then disinfected using ultraviolet (UV) light before it is discharged to Wolf Creek (Stantec 2016). The design capacity of the WWTP is 2.78 mgd with a peak flow capacity of up to 7.0 mgd (Stantec 2016). The collection system conveys an average annual flow of approximately 2.2 mgd of raw wastewater to the WWTP. The City also maintains 61.5 miles of pipeline within the collection system and seven wastewater lift stations (Stantec 2016).

The current average daily flow of 1.3 mgd is less than 50% of the current 2.8 mgd design capacity. However, the peak flows that the plant currently receives exceed the peak flow design capacity. Currently, the plant's design peak hour flow is around 16 mgd and the measured peak hour flows at the plant are 18.9 mgd (Stantec 2016). The City is currently evaluating upgrading the collection system to address conveyance capacity constraints, upgrading lift stations and upgrades to the plant to expand treatment capacity (Stantec 2016).

The proposed project would route wastewater by gravity through an 8-inch sewer collector in Springhill Drive which connects to an 18-inch trunk sewer line in Idaho Maryland Road. The Idaho Maryland Trunk sewer line connects to the city's Main Trunk sewer where Idaho Maryland Road intersects East Main Street. The Main Trunk is aligned roughly parallel to Highway 49 and ultimately conveys flows to the City's WWTP (Appendix L). The service area that discharges into the Idaho Maryland trunk sewer line covers an area of approximately 700 acres.

Electricity and Natural Gas

Electric service in this portion of the City is provided by PG&E. PG&E's power is generated in fossil-fueled plants, hydroelectric powerhouses, geothermal generators, a nuclear power plant, and ten combustion turbines. PG&E also buys power from independent power producers and other utilities. According to their website, PG&E provides service to approximately 5.1 million customers in Northern and Central California and has approximately 18,616 miles of interconnected transmission lines and 141,215 miles of distribution lines (PG&E 2015).

PG&E's services are provided in accordance with California Public Utilities Commission rules and regulations. Electric connections would be provided to the project site from the existing transmission network in the project vicinity. The project applicant would be responsible for the costs associated with extension of electrical service infrastructure to the project site.

PG&E also supplies natural gas to homes and businesses in the project area. PG&E has 42,141 miles of distribution pipelines supplying 4.3 million residential gas customers (PG&E 2015). Extension of the natural gas infrastructure by PG&E is financed through the collection of developer fees and through consumer payment for service.

Schools

Three school districts comprise the public education system in the City of Grass Valley: Grass Valley Elementary School District, Nevada Joint Union High School District, and Sierra Community College District.

The Grass Valley Elementary School District manages four schools: Bell Hill Elementary (342 South School Street), Lyman Gilmore Middle (10837 Rough and Ready Highway), Grass Valley Charter (225 South Auburn Street), and Margaret G. Scotten Elementary (10821 Squirrel Creek Road). The closest elementary schools to the project site are Bell Hill Elementary, about 1.5 miles southwest of the project site; Lyman Gilmore School, 1.6 miles west of the site; and Margaret G. Scotten, 1.8 miles west of the project site. Grass Valley Charter School, a Pre-K through 8th grade school, is about 1.18 miles southwest of the project site. Since 2005, district enrollment has remained between 1,653 students and 1,745 students (California Department of Education 2017a). The district has a capacity of 2,189 students (Hardy 2017). Enrollment has increased slightly from 1,663 students in the 2010-2011 school year to 1,745 students for the 2015–2016 school year (California Department of Education 2017a). For the 2015–2016 school year, enrollment reached 210 students for Bell Hill Elementary, 527 students for Lyman Gilmore Middle, 487 students for Margaret G. Scotten Elementary, and 521 students for Grass Valley Charter (California Department of Education 2017b).

The Nevada Joint Union High School District operates Bear River High School (11130 Magnolia Rd.), Ghidotti Early College High School (250 Sierra College Drive), Nevada Union High School (11761 Ridge Road), Silver Springs High School (140 Park Avenue), and North Point Academy (11761 Ridge Road). The district has seen steadily declining enrollment since 1998, with 2,947 students enrolled in the 2015–2016 school year (California Department of Education 2017c). The district has a total capacity of 4,915 students (Nevada Joint Union High School District 2017). Nevada Union High School is about 1.1 miles northwest of the project site with a total enrollment of 1,653 for the 2015–2016 school year (California Department of Education 2017d) and a capacity of 2,814 (Nevada Joint Union High School District 2017). Bear River High School is approximately 12 miles south of the project site. Three other high schools are located near the project site but because they are more specialized, it is likely that most students would attend Nevada Union High. Silver Springs High, a continuing education high school, is about 1.5 miles southwest of the project site. Bitney College Prep High School, a public charter school authorized by the Nevada County Superintendent of Schools, is also about 0.3 miles north of the project site. Ghidotti High School is located about half a mile northwest of the project site, and has partnered with Sierra College to allow high school students to attend Sierra College courses tuition free. Attendance for this school is capped at 160 students (Ghidotti 2017).

Under authority of Education Code Section 17620 et seq., the governing board of a school district is authorized to levy a fee for the purpose of funding the construction or reconstruction of school facilities and may be used by the district to pay bonds, notes, loans, leases or other installment agreements for temporary as well as permanent facilities. The Nevada Joint Union High School District and Grass Valley Elementary School District collect combined fees established by the State for enclosed residential, commercial, and industrial construction. The districts charge $3.48 per square foot for residential development and $0.56 per square foot for commercial and industrial development (Hardy 2017).

Sierra College operates a northern campus in the City at 250 Sierra College Drive; the main campus is located in Rocklin, approximately 37 miles south. The Grass Valley location is adjacent to Nevada Union High School.

Fire Protection and Emergency Medical Services

Fire Protection within the City is provided by the City of Grass Valley Fire Department (GVFD). The GVFD employs 14 firefighters/EMTs and maintains two fire stations and an administrative office within City Hall: Station No. 1 (472 Brighton Street) and Station No. 2 (213 Sierra College Drive), and the Grass Valley Fire Administrative Offices (125 East Main Street). GVFP maintains two frontline and one reserve engine, one aerial ladder truck, and miscellaneous staff and support vehicles. The fire apparatus is staffed with a minimum of three Grass Valley and one Nevada County Consolidated firefighters each day. Additionally, the career firefighters assigned to the fire engines

are supplemented with an intern firefighter assigned to each engine every day. An Interim Fire Chief, Battalion Chief, Deputy Fire Marshal and a part-time administrative assistant provide for the management and fire prevention services of the fire department. (City of Grass Valley 2017)

For areas outside the City, the Nevada County Consolidated Fire District serves the area north, west and south of the City and Ophir Hill Fire District serves the area east of the City. The Grass Valley Fire Department partners with the Nevada County Consolidated Fire Department and the Nevada City Fire Department under a Joint Operating Agreement wherein the departments respond as if they were one agency and in which the key feature is the response of the closest engine to an incident regardless of jurisdiction (City of Grass Valley 2017). In 1998, these agencies entered into an Automatic Aid agreement, which provides for a response by a minimum of two pieces of equipment anywhere in the City within four minutes, 24 hours/day (Quad Knopf 1999). In addition, mutual aid from agencies state-wide is provided pursuant to the California Fire Service and Rescue Emergency Mutual Aid System via its Mutual Aid Plan (Quad Knopf 1999). Finally, the California Department of Forestry and Fire Protection (CALFIRE) provide protection for wildland areas; they are responsible for wildfires during the fire season and thus structures in wildlands do not have year-round protection.

Law Enforcement

The City maintains its own police force, the Grass Valley Police Department (GVPD). The GVPD provides both police and animal control services within the incorporated areas of the city. Police headquarters are located at 129 South Auburn Street whereas the animal control facility is located on Freeman Lane. The GVPD sustains a 24-hour force consisting of 26 officers and 5 professional support staff, along with eight reserve officers and 12 volunteers. The current police station was constructed in 1996 to accommodate a larger police force. This was in regards to the projected population growth within the City's sphere of influence. (City of Grass Valley 2017c)

Library Services

The Nevada County Library System maintains one library with Grass Valley boundaries, at 207 Mill Street, and five other libraries throughout the county. The Grass Valley Library - Royce Branch, it is a Carnegie library and is registered in the National Register of Historic Places (Nevada County 2017). It provides various services including children's educational opportunities, computer and internet access, and book and video rentals. The library serves the City's approximate population of 12,860 people (U.S. Census Bureau 2010).

Solid Waste

Waste Management, Inc. provides waste management services for the City. Solid waste collected within the City is taken to the McCourtney Road Transfer Station and Recycling

Center located at 14741 Wolf Mountain Road before it is hauled outside the County boundaries to landfills with contracts with Nevada County (Quad Knopf 1999). The McCourtney Road Transfer Station (Permit 29-AA-0010) is permitted to process 350 tons per day with a total number of 1,090 vehicles per day (CalRecycle 2017). On average, in 2015 the facility received 291 tons of waste per day and 698 vehicle trips per day, with a peak of 960 vehicle trips per day (Simpson 2017). However, the current trips per day are now closer to the 2015 peak number because the local recycle buyback centers closed in 2016, resulting in more trips to the transfer station (Simpson 2017).

Waste Management has an agreement with Lockwood Regional Landfill, located in Sparks, Nevada, which serves as the primary landfill disposal site (RBF Consulting 2013). The Lockwood Landfill, located in Sparks, Nevada, is a Class I Municipal Solid Waste Site that accepts municipal solid waste. Currently, the landfill receives approximately 5,000 tons of waste per day, based on a five day work week, and has a capacity of 302.5 million cubic yards. Based on an aerial survey conducted in April 2010, the landfill contained a waste volume of approximately 32.8 million cubic yards. (Nevada Division of Environmental Protection 2015)

When inclement weather makes it infeasible to travel to the Lockwood Regional Landfill, solid waste is transported to the Anderson Landfill in Anderson, California (RBF Consulting 2013). The Anderson Landfill has a closure date of 2055 and a capacity of approximately 16.4 million cubic yards (Shasta County 2013), with 11.5 million cubic yards of capacity remaining (RBF Consulting 2013).

Within Nevada County, about 31% of solid waste is disposed, 23% is recyclable, 30% is compostable, and 16% is recoverable inert waste such as asphalt or concrete (Nevada County 2015a).

Parks and Recreation Facilities

The City owns and maintains approximately 108 acres of park land consisting of 7 developed park sites and one undeveloped park site (City of Grass Valley 2017). City parks include: Memorial Park (7.6 acres), Condon Park (80 acres), Mautino Park (12 acres), Pelton Wheel Museum/Glen Jones Park (2.0 acres), Minnie Park (2.0 acres), Dow Alexander Park (0.25 acre), and Elizabeth Daniels Park, (0.16 acre) (City of Grass Valley 2001). Memorial Park, Condon Park, and Mautino Park are community parks while the other four are neighborhood parks and developed to serve the surrounding residential areas. Memorial Park is fully developed and includes a Video History museum whereas Condon Park is only partially developed and includes the LOVE community center, two lighted baseball fields, a disc golf course, and a skate park. Additionally, Sierra College maintains its own recreational area as does Nevada County Country Club. With a population estimate of 12,944 in 2015 (US Census 2017), the City exceeds its park standards of 5-8 acres per 1,000 population for community parks (City of Grass Valley 2001). With 4.41 acres of neighborhood parks, the city does not meet its standard of 1-2 acres per 1,000 population for

neighborhood parks (City of Grass Valley 2001). The City plans to develop one additional park - Morgan Ranch Park, which would be a neighborhood park located on land that has been dedicated to the City and is currently open space.

14.2 REGULATORY FRAMEWORK

This section includes applicable federal, state, and local laws, regulatory guidance, and general plan goals and policies that govern public services and utilities in the City. Where services are provided by external agencies, such as Nevada County, goals and policies of the applicable jurisdiction providing the service are also discussed.

Water Supply

Federal Regulations

The Safe Drinking Water Act (SDWA) is the main federal law that regulates the quality of potable water for the public. The SDWA authorizes the U.S. Environmental Protection Agency (EPA) to establish national health-based standards for drinking water quality. These standards may apply to both naturally occurring and man-made constituents in drinking water. The national standards are established using scientific methods to evaluate health risks and consider available technology and costs to achieve the standards. The National Primary Drinking Water Regulations establish maximum contaminant levels or mandated methods for water treatment to remove contaminants, as well as requirements for regular water quality testing to make sure standards are achieved. In addition to setting these standards, the EPA provides guidance, assistance, and public information about drinking water, collects drinking water data, and oversees state drinking water programs. States can apply to the EPA for authority to implement SDWA within their jurisdictions by showing that they will adopt standards at least as stringent as the national standards and adequately enforce these standards. California has been granted this authority, and the California Department of Public Health establishes and enforces statewide drinking water standards.

The SDWA was passed by Congress in 1974 and amended in 1986 and 1996. The original focus of the law was on treatment of water supplies as a means of providing safe drinking water. However, the 1996 amendments expanded the focus to recognize protection of water quality at the source. Under this expanded focus, SDWA requires many actions to protect rivers, lakes, reservoirs, springs, and ground water wells that provide sources of drinking water supplies. The 1996 amendments also recognized operator training, funding for water system improvements, and public information as important components of safe drinking water.

State Regulations

California Safe Drinking Water Act

The California Department of Public Health administers the state's SDWA through the Drinking Water Program. This program implements the regulatory authority of the Department of Public Health over public water systems in the state. Public water system operators are required to regularly monitor their drinking water sources and supplies for microbiological, chemical, and radiological contaminants to demonstrate that the water meets the regulatory requirements regarding primary maximum contaminant levels (MCLs) listed in Title 22 of the California Code of Regulations.

Urban Water Management Planning Act

California Water Code Section 10610 et seq. requires that all public water systems that provide water to more than 3,000 customers or supply more than 3,000 AFY must prepare an Urban Water Management Plan. The California Department of Water Resources provides guidance to urban water suppliers in the preparation and implementation of Urban Water Management Plans. These plans must be updated at least every 5 years.

Local Regulations

The Grass Valley General Plan 2020, adopted in 1999, includes the following policies pertinent to the City's water supply.

Conservation and Open Space Element

15-COSO: Protection of ground- and surface water quality.

16-COSO: Inclusion of air and water quality considerations in land use decisions rendered by the Planning Commission and City Council.

21-COSP: Continue to implement water quality improvement plans, including storm water separation and sewage treatment plant expansion.

23-COSP: Respond appropriately to state and federal air and water quality policies and policy changes, understanding the implications of regulations and standards, and maintaining a continuing public education program.

Safety Element

11-SP: Maintain appropriate standards for water supply, pressure and distribution for fire suppression purposes.

Wastewater Conveyance and Treatment

Federal Regulations

National Pollutant Discharge Elimination System Permits (Federal and State)

The federal Clean Water Act regulates the discharge of treated effluent from wastewater treatment plants. This authority is administered through the Central Valley Regional Water Quality Control Board (CVRWQCB).

The National Pollutant Discharge Elimination System (NPDES) permit system was established in the Clean Water Act to regulate municipal and industrial discharges to surface waters of the United States. The discharge of wastewater to surface waters is prohibited unless an NPDES permit has been issued to allow that discharge. Each NPDES permit includes the following provisions: effluent and receiving water limits of allowable concentrations and/or mass of pollutants contained in the discharge; prohibitions on discharges not specifically allowed under the permit; provisions that describe required actions by the discharger, including industrial pretreatment, pollution prevention, and self-monitoring activities; and other regulatory requirements. The City's WWTP operates under NPDES permit No. CA 0079898.

State Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is California's statutory authority for the protection of water quality. Under the Porter-Cologne Act, the state must adopt water quality plans, policies, and objectives that will provide protection to the state's waters for the use and enjoyment of the people of California. In California, the State Water Resources Control Board (SWRCB) has authority and responsibility for establishing policy for water quality control issues for the state. Regional authority for planning, permitting, and enforcement is delegated to the nine RWQCBs. The Porter-Cologne Act authorizes the SWRCB and RWQCBs to issue NPDES permits containing waste discharge requirements (WDRs), and to enforce these permits. SWRCB and RWQCB regulations implementing the Porter-Cologne Act are included in Title 27 of the California Code of Regulations.

General Waste Discharge Requirements for Sanitary Sewer Systems

The General WDRs for Sanitary Sewer Systems were adopted by the SWRCB in May 2006. These WDRs require local jurisdictions to develop a sewer system management plan (SSMP) that addresses the necessary operation and emergency response plans to reduce sanitary sewer

overflows (SWRCB 2006). The WDRs require that the local jurisdiction approve the SSMP and the Grass Valley City Council approved an update to the City's SSMP in September 2012.

Local Regulations

City of Grass Valley 2020 General Plan

The Grass Valley 2020 General Plan Conservation and Open Space Element includes the following policy pertinent to the City's wastewater system.

> **21-COSP:** Continue to implement water quality improvement plans, including storm water separation and sewage treatment plant expansion.

City of Grass Valley Wastewater Systems Master Plan

The City adopted its Wastewater Systems Master Plan (Master Plan) in 2012 and recently completed an update in August 2016. The Master Plan provides guidance on how the City can efficiently and effectively manage, operate, and maintain all parts of the City's Sewer Collection System, including the WWTP, collection system, and associated facilities; ensure adequate capacity is available to convey peak wastewater flows; and reduce the frequency of sanitary sewer overflows wherever possible. The Master Plan provides assessments of the existing collection system and WWTP condition and capacity, as well as options for providing additional capacity for planned future development.

City of Grass Valley Sewer System Management Plan

In accordance with the requirements of the General WDRs for Sanitary Sewer Systems, the City of Grass Valley has prepared and adopted an SSMP that describes the operations and maintenance program, establishes design and construction standards, defines an overflow emergency response plan and the fats, oils and grease program, describes methods and standards of the system evaluation and capacity assurance plan, and outlines a communication program.

Electric/Natural Gas

Federal Regulations

There are no federal regulations applicable to the potential environmental effects associated with the provision of energy utilities to the project. Federal regulations associated with energy consumption and conservation are described in Chapter 16, CEQA-Mandated Sections.

State Regulations

Title 24 of the California Code of Regulations requires the use of energy-efficient appliances in all new residential, commercial, and educational facilities. No special permits for electrical hook-up, gas hook-up, or other energy sources are required; however, building permits and compliance with adopted building codes would be required for these services. PG&E electric and gas services are provided in accordance with the California Public Utilities Commission rules and regulations.

Local Regulations

There are no local regulations related to the potential environmental effects associated with provision of energy utilities to the project.

Schools

Federal Regulations

There are no federal regulations applicable to the potential environmental effects associated with provision of public education services to the project.

State Regulations

California State Assembly Bill 2926 – School Facilities Act of 1986

In 1986, Assembly Bill (AB) 2926 was enacted by the State of California authorizing entities to levy statutory fees on new residential and commercial/industrial development in order to pay for school facilities. AB 2926, entitled the School Facilities Act of 1986, was expanded and revised in 1987 through the passage of AB 1600, which added Section 66000 et seq. of the California Government Code.

Proposition 1A/Senate Bill 50

Proposition 1A/Senate Bill 50 (SB 50), (Chapter 407, Statutes of 1998) created the School Facility Program where eligible school districts may obtain state bond funds. State funding requires matching local funds that generally come from developer fees. The passage of SB 50 eliminated

the ability of cities and counties to require full mitigation of school impacts and replaced it with the ability for school districts to assess fees directly to offset the costs associated with increasing school capacity as a result of new development. The old "Stirling" fees were incorporated into SB 50 and are referred to as Level 1 fees. These fees, as of February 2016 are currently capped at $3.48 per square foot for new residential development and $0.56 per square foot for commercial and industrial (nonresidential) development and age-restricted senior housing. Districts meeting certain criteria may collect Level 2 fees as an alternative to Level 1 fees. Level 2 fees are calculated under a formula in SB 50. Level 3 fees are approximately double Level 2 fees and are implemented only when the State Allocation Board is not apportioning state bond funds. The passage of Proposition 1D on November 7, 2006, precludes the implementation of Level 3 fees for the foreseeable future. Although SB 50 states that payment of developer fees are "deemed to be complete and full mitigation" of the impacts of new development, fees and state funding do not necessarily fully fund new school facilities.

California Education Code – Sections 35500 and 35700

School district reorganizations are governed by Sections 35500 and 35700 of the California Education Code. District boundary reorganization may be initiated by "petition" by a developer or group of citizens, as well as by the majority of a school district governing body. A developer may initiate proceedings for a reorganization of a school district boundary for an uninhabited area. The more common form of school district boundary reorganization is through a petition of a majority vote of the governing body of one or more school districts that have jurisdiction in the area proposed to be reorganized.

Local Regulations

There are no local regulations applicable to the potential environmental effects associated with provision of public education services to the project.

Fire Protection and Emergency Medical Services

Federal Regulations

There are no federal regulations applicable to the potential environmental effects associated with provision of fire protection services to the project.

State Regulations

California Government Code

Effective January 1, 2005, California Government Code Section 51182 and Public Resources Code Section 4291 were modified with respect to fire risk reduction measures required to be enforced by local agencies and CAL FIRE for occupied dwellings or structures. These measures require:

- Maintaining a fire break made by removing and clearing away, for a distance of not less than 100 feet on each side of a dwelling or structure, or to the property line whichever is nearer, all flammable vegetation or other combustible growth. This does not apply to single specimen trees, ornamental shrubbery, or similar plants that are used as ground cover, if they do not form a means of rapidly transmitting fire from the native growth to any dwelling or structure.
- Maintaining additional fire protection or firebreaks made by removing all brush, flammable vegetation, or combustible growth that is located within 100 feet from an occupied dwelling or occupied structure or to the property line, or at a greater distance if required by State law, or local ordinance, rule, or regulation. Grass and other vegetation located more than 100 feet from a dwelling or structure and less than 18 inches in height above the ground may be maintained where necessary to stabilize the soil and prevent erosion.
- Removal of that portion of any tree that extends within 10 feet of the outlet of any chimney or stovepipe.
- Maintaining any tree adjacent to or overhanging any building free of dead or dying wood.
- Maintaining the roof of any structure free of leaves, needles, or other dead vegetative material.
- Providing and maintaining at all times a screen over the outlet of every chimney or stovepipe that is attached to any fireplace, stove, or other device that burns any solid or liquid fuel. The screen shall be constructed and installed in accordance with the California Building Standards Code.
- Prior to constructing a new dwelling or structure that will be occupied or rebuilding an occupied dwelling or occupied structure damaged by a fire, the construction or rebuilding of which requires a building permit, the owner shall obtain a certification from the local building official that the dwelling or structure, as proposed to be built, complies with all applicable State and local building standards.

Uniform Fire Code

The Uniform Fire Code contains regulations relating to construction, maintenance, and use of buildings. Topics addressed in the code include fire department access, fire hydrants, automatic storage and use, provisions intended to protect and assist fire responders, industrial processes, and many other general and specialized fire-safety requirements for new and existing buildings and the surrounding premises. The code contains specialized technical regulations related to fire and life safety.

California Health and Safety Code

State fire regulations are set forth in Sections 13000 et seq. of the California Health and Safety Code, include regulations for building standards (as also set forth in the California Building Code), and fire protection and notification systems, fire protection devices such as extinguishers and smoke alarms, high-rise building and childcare facility standards, and fire suppression training.

California Occupational Safety and Health Administration

In accordance with California Code of Regulations, Title 8, Sections 1270, Fire Prevention, and 6773, Fire Protection and Fire Equipment, the California Occupational Safety and Health Administration (Cal/OSHA) has established minimum standards for fire suppression and emergency medical services. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, fire hosing sizing requirements, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all firefighting and emergency medical equipment.

Local Regulations

City of Grass Valley 2020 General Plan

City of Grass Valley 2020 General Plan includes the following policies applicable to fire protection and suppression.

24-CP: Coordinate circulation and development plans with public safety agencies, fire departments/districts and emergency service providers.

6-SP: Incorporate fire hazard reduction considerations into land use plans/patterns, both public and private.

7-SP: Identify, maintain, and mark evacuation routes for use in case of disasters or emergencies.

8-SP: Assure public awareness of fire-safety measures, including those addressing property maintenance and evacuation

9-SP: Develop and implement fire-safe community design and landscaping standards, construction codes, and property maintenance regulations.

10-SP: Adopt and implement appropriate standards for access roads, on-site driveway standards, fuel reduction and emergency water supply.

11-SP: Maintain appropriate standards for water supply, pressure and distribution for fire suppression.

12-SP: Maintain a high level of inter-jurisdictional cooperation and coordination, including appropriate automatic aid agreements with fire protection/ suppression agencies automatic aid agreements with fire protection/suppression agencies in western Nevada County

Law Enforcement

There are no federal, state, or local regulations applicable to the potential environmental effects associated with provision of law enforcement services to the project.

Library Services

Federal Regulations

There are no federal regulations applicable to the potential environmental effects associated with provision of library services to the project.

State Regulations

There are no state regulations applicable to the potential environmental effects associated with provision of library services to the project.

Local Regulations

City of Grass Valley 2020 General Plan

The City of Grass Valley General Plan includes the following policies relevant to libraries.

10-RP: Expand the existing library as a cultural venue.

19-CDP: Retain existing public offices and facilities Downtown, including the Library, Post Office, Veterans Hall and City Hall.

Solid Waste

Federal Regulations

Resource Conservation and Recovery Act

Title 40 of the Code of Federal Regulations (CFR), Part 258, Resource Conservation and Recovery Act (RCRA), Subtitle D, contains regulations for municipal solid waste landfills and requires states to implement their own permitting programs incorporating the federal landfill criteria. The federal regulations address the location, operation, design, groundwater monitoring, and closure of landfills.

State Regulations

California Integrated Solid Waste Management Act – Assembly Bill 939 (AB 939)

AB 939, passed in 1989, mandated a focus on the conservation of natural resources. Cities and counties were required to create comprehensive source reduction, recycling, and composting programs. The goal of these programs is to reduce the amount of waste sent to landfills by 50%. AB 939 requires cities and counties to prepare solid waste management plans and adopt source reduction and recycling elements (SRREs) to implement AB 939's goals. These goals include diverting approximately 50% of solid waste from landfills and identifying programs to stimulate local recycling in manufacturing and the purchase of recycled products.

The focus of this bill was a major change, shifting the emphasis from landfill disposal toward waste reduction, recycling and composting whenever possible. This approach conserves natural resources and saves energy, decreases pollution, and provides new jobs in the waste industry.

AB 939 established the following priorities for waste management:

- Waste reduction
- Recycling and composting
- Controlled combustion of waste to generate electricity
- Landfilling

In conjunction with Nevada County, the City of Grass Valley has adopted the countywide Source Reduction and Recycling Element that establishes goals and methodologies for compliance with AB 939. Additionally, on April 23, 2002, the County adopted the "Green Procurement and Sustainable Practices Policy" to encourage the reduction of solid waste entering landfill sites (RBF Consulting 2013). This policy requires waste prevention, recycling, market development, and use of recycled/recyclable materials through lease agreements, contractual relationships and purchasing practices with vendors, contractors, businesses, and other public and governmental

agencies. In addition, Nevada County Department of Sanitation (formerly the Department of Transportation and Sanitation) recently received a $100,000 grant from the California Integrated Waste Management Board to fund the program Nevada County Recycles, which is dedicated to educating schools, businesses, and individuals about recycling (RBF Consulting 2013).

Senate Bill 1016

SB 1016 enacted in 2007 changes the process for bi-annual review of a jurisdiction's source reduction and recycling element and allows the California Integrated Waste Management Board to make a finding whether each jurisdiction is in compliance with the requirements based on the jurisdiction's change in its per capita disposal rate. No longer is a diversion rate used to calculate compliance with AB 939, but a per capita disposal rate is used that calculates the number of pounds of solid waste diverted, divided by the total population, divided by 365 days

Solid Waste Reuse and Recycling Access Act of 1991

AB 1327 (Solid Waste Reuse and Recycling Access Act), enacted in 1991, requires jurisdictions to adopt ordinances that require development projects to provide adequate storage areas for collection and removal of recyclable materials.

Assembly Bill 341

AB 341, which was enacted in 2011, states that it is the policy goal of the state that not less than 75% of solid waste generated be reduced, recycled, or composted by the year 2020. The bill also requires that a business, defined to include a commercial or public entity that generates more than 4 cubic yards of commercial solid waste per week or is a multifamily residential dwelling of five units or more arrange for recycling services, on and after July 1, 2012. Jurisdictions, on and after July 1, 2012, are required to implement a commercial solid waste recycling program or revise their SRRE to meet this requirement.

California Department of Resources Recycling and Recovery

CalRecycle is the new home of California's recycling and waste reduction efforts. Officially known as the Department of Resources Recycling and Recovery, CalRecycle is a new department within the California Natural Resources Agency and administers programs formerly managed by the California Integrated Waste Management Board and Division of Recycling. CalRecycle is the State agency charged with the primary responsibility for permitting of solid waste facilities. CalRecycle operates through its designated Local Enforcement Agencies (LEAs), which typically are county health departments. Air pollution from solid waste facilities is regulated by local air pollution control districts or air quality management districts, while water pollution is regulated by RWQCBs.

Universal Waste Regulations

Universal wastes are hazardous wastes that are widely produced by households and many different types of businesses such as medical offices. Universal wastes include televisions, computers, and other electronic devices as well as batteries, fluorescent lamps, and mercury thermostats and other mercury-containing equipment, among others. The hazardous waste regulations identify seven categories of hazardous wastes that can be managed as universal wastes. Any unwanted item that falls within one of these waste streams can be handled, transported, and recycled following the simple requirements set forth in the universal waste regulations (22 CCR Division 4.5, Chapter 23).

SB 1016 repeals this review schedule on January 1, 2018, and, after that date, requires CalRecycle to review each jurisdiction's SRRE and household hazardous waste element at least once every 2 years.

Local Regulations

City of Grass Valley Solid Waste/Recyclable Materials Storage Ordinance

The City of Grass Valley Solid Waste/Recyclable Materials Storage Ordinance, adopted on April 10, 2007, requires developers for certain projects, such as new construction of multifamily and nonresidential developments, to provide solid waste and recyclables storage areas in the number, dimensions and types required by the department or review authority. Additional storage areas may be required, as deemed necessary (RBF Consulting 2013).

Parks and Recreation Facilities

State Regulations

Quimby Act

In 1975, the Quimby Act (California Government Code Section 66477, as amended in 1982) granted Cities and Counties authority to pass ordinances requiring developers to set aside land, donate conservation easements, or pay fees for park improvements. The City of Grass Valley has adopted such an ordinance as discussed in the following Local Regulations section. The goal of the Quimby Act was to require developers to help mitigate the impacts of their developments. Special districts must work with Cities, and/or Counties to receive parkland dedication and/or in-lieu fees. The fees must be paid and land conveyed directly to the local public agencies that provide park and recreation services to the affected community. Revenues generated through the Quimby Act cannot be used for the operation and maintenance of park facilities.

Local Regulations

City of Grass Valley 2020 General Plan

The City of Grass Valley General Plan includes the following policies relevant to parks and recreation.

Recreation Element

1-RP: Provide parks and open spaces of different sizes and types to respond to the needs of a diverse population, including trails for pedestrian and equestrian use, bicycle pathways, linear parkways and park-like natural areas.

2-RP: Increase the standard of park acreage to population.

3-RP: Distinguish neighborhood park needs from community and regional park needs.

6-RP: Provide non-motorized linkages between parks and open spaces.

City of Grass Valley Parks and Recreation Master Plan

The City's Parks and Recreation Master Plan includes park standards per 1,000 residents. The parks standards are provided below in Table 14-3.

Table 14-3
City of Grass Valley Park and Recreation Standards

Park Type	Standard (acres/1,000)	Recreation Facility	Standard (per population)
Urban Plaza	None	Baseball/Softball Fields	1 per 4,800
Pocket Parks	0.25–0.5	Soccer Field	1 per 4,100
Neighborhood Park	1–2	Football Field	1 per 15,000
Community Park	5–8	Outdoor Basketball	1 per 5,600
		Tennis Courts	1 per 2,400
		Volleyball	1 per 7,900
		Swimming Pools	21,100

Source: City of Grass Valley 2001

City of Grass Valley Parkland Dedication

Grass Valley Municipal Code section 17.86.030 establishes the City's requirements for dedication of land and/or the payment of fees to the City for park and recreational purposes as a condition of the approval of a Tentative Map, consistent with the Quimby Act. The determination of whether a subdivider shall dedicate land and/or pay a fee may be made the City Council. Parkland dedication fees may be used to develop new or rehabilitate existing park or recreation facilities to serve a proposed subdivision.

14.3 IMPACTS

Methods of Analysis

This section identifies and discusses environmental impacts resulting from the proposed project, and suggests mitigation measures to reduce the levels of impact. Potential impacts to public services and facilities were determined by comparing the proposed project to the existing conditions. The need for new or expanded services or facilities and the related physical impacts that could occur were analyzed qualitatively.

Water Supply

The analysis of impacts to water supply services was based on a consideration of the water demand generated by the proposed project compared to the thresholds of significance listed below. The expected water demand for the proposed project was determined based on water demand factors for proposed land uses on project site. Table 14-4 shows the anticipated water demand for the proposed project.

Table 14-4
Proposed Project Water Demand

Proposed Use [a]	Demand Factor	Proposed Project (acres)	Total Demand (gpd/AFY)
Alternative A			
Commercial	1,100 gpd/ac	21.04	23,144 gpd/25.94 AFY
Multi-Family Residential	1,900 gpd/ac	5.7	10,830 gpd/12.14 AFY
		Total	**38.08 AFY**
Alternative B			
Commercial	1,100 gpd/ac	13.7	15,070 gpd/16.89 AFY
Multi-Family Residential	1,900 gpd/ac	12	22,800 gpd/25.56 AFY
Office		1	1,100 gpd/1.23 AFY
		Total	**43.68 AFY**

Notes: gpd = gallons per day; AFY = acre-feet per year; ac = acre.
[a] Stantec 2016b

Wastewater Conveyance and Treatment

A Sewer Capacity Assessment was prepared for the project by Stantec Consulting Services, Inc. and is included in Appendix L. The analysis of impacts to wastewater services was based on a consideration of the wastewater treatment demand generated by the proposed project compared to the thresholds of significance discussed below. Table 14-5 shows the projected volume of wastewater generated based on the City's generation rates. The Sewer Capacity Assessment assumed that Alternative A would include 181,900 square feet of commercial space, while the

proposed site plans indicate development of 178,960 square feet. Thus the Sewer Capacity Assessment analysis provides a conservative analysis of potential impacts from Alternative A.

Table 14-5
Proposed Project Wastewater Generation

Proposed Use	SF/Units	Generation Rate (gpd/ac or unit)	Average Dry Weather Wastewater (gpd)	Safety Factor = 2	Peak Flow (gpd) (Peaking Factor = 4.8)[1]
Alternative A					
Commercial	181,900 (22.6 ac)	850	19,210	38,420	184,416
High Density Residential	90 (4.15 ac)	135	12,150	24,300	116,640
		Total	**31,360 gpd/0.031 mgd**	**62,720 gpd**	**301,056 gpd**
Alternative B					
Commercial	104,350 (14.2 ac)	850	12,108	24,216	116,237
High Density Residential	1721 units	135	23,220085	46,440170	221,616222,912
		Total	**31,36035,328 gpd/0.0351 mgd**	**70,656386 gpd**	**323,343339,149 gpd**

Notes: SF = square feet; gpd = gallons per day; ac = acre; mgd = million gallons per day.
Source: Appendix L

Solid Waste

The analysis of impacts to solid waste is based on commercial and residential sector generation rates provided by CalRecycle. CalRecycle provides a range of rates for each sector, as shown in Table 14-6. This EIR uses middle-of-the-range generation rates to be conservative.

Table 14-6
Waste Generation

	Proposed Project	Waste Generated	Total Waste
Alternative A			
Commercial/Retail	178,960 sf	0.046 lb/square feet/day	8,232 lb/day
Multifamily Residential	90 du	5.31 lb/du/day	477.9 lb/day
		Total	**8,709.9**
Alternative B			
Commercial/Retail	104,350 sf	0.046 lb/sf/day	4,800 lb/day
Office	8,500 sf	0.006 lb/sf/day	51 lb/day
Multifamily Residential	1721 du	5.31 lb/du/day	909.72913.32 lb/day
		Total	**5,764.320.72 lb/day**

Notes: sf = square feet; lb = pound; du = dwelling unit.
Source: CalRecycle 2016

Significance Criteria

Water Supply

Impacts of the proposed project to water resources would be considered significant if one or more of the following conditions would result from implementation of the proposed project. Would the project:

- Result in the inability of available water supply to meet the proposed project demand?
- Cause provision for water system modifications to be insufficient to meet proposed project demand?

Wastewater Conveyance and Treatment

A wastewater impact would be significant if any of the following conditions would result with implementation of the proposed project. Would the project:

- Exceed wastewater treatment requirements of the applicable RWQCB?
- Require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?
- Result in a determination by the wastewater treatment provider that serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Electricity and Natural Gas

An impact to electrical and gas utilities would be significant if any of the following conditions would result from implementation of the proposed project. Would the project:

- Result in increased demand for gas or electricity requiring new production facilities to supply the development?
- Require extension of infrastructure to the project area, the construction of which would cause significant environmental impacts?
- Encourage activities that result in the use of large amounts of energy or fuel, or use energy in a wasteful manner?
- Affect the ability of suppliers to accommodate the energy needs of the proposed project?

Schools, Libraries, and Recreation

Schools

An impact to schools would be significant if any of the following conditions would result from implementation of the proposed project. Would the project:

- Substantially increase school enrollment in any district that is near or over capacity?

Libraries

An impact to libraries would be significant if the following condition would result from implementation of the proposed project. Would the project:

- Increase demand for library services that would require expansion of library facilities, the construction of which would cause significant environmental impacts?

Parks and Recreation

An impact to parks and recreational opportunities would be significant if any of the following conditions would result from implementation of the proposed project. Would the project:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered park facilities?
- Result in the need for new or physically altered park facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or park standards?
- 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?
- Include recreational facilities or require the construction or expansion of recreation facilities which might have an adverse physical effect on the environment?

Fire Protection and Emergency Medical Services

An impact to fire protection and emergency medical services would be significant if any of the following conditions would result from implementation of the proposed project. Would the project:

- Result in physical prevention of the routine extension of fire protection and emergency service to the project?
- Result in inadequacy of water volume and/or pressure to provide water for firefighting at the project site?

- Result in increased demands on existing fire services that would require additional fire protection facilities, the construction of which would result in significant environmental impacts?
- Result in increased demands on fire protection resources that would reduce overall fire protection adequacy within the City?

Law Enforcement

An impact to law enforcement services would be significant if any of the following conditions would result from implementation of the proposed project. Would the project:

- Require new or physically altered law enforcement facilities, the construction of which would result in significant environmental impacts?
- Creation of a physical obstacle preventing the provision of law enforcement activities?
- Result in any conflict with the ability of the Police Department to provide law enforcement services?

Solid Waste

An impact to solid waste collection services would be significant if the following condition would result from implementation of the proposed project. Would the project:

- Generate a volume of solid waste which cannot be accommodated by the existing solid waste collection service or landfill or generate a daily volume of waste which cannot be accommodated by the existing disposal facilities and services?

Impact Analysis

Impact 14-1: Would the project result in inadequate water supply and distribution infrastructure requiring construction of new facilities

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A

Development of Alternative A would increase the demand for water supplies at the project site over what currently exists. Although the project site is located in the City of Grass Valley, it is located outside the City's water service area, and inside NID's water service area (Stantec 2016). Existing

NID pipelines surround the project site to the north, south, and east; they run along Dorsey Drive, Idaho Maryland Road, Spring Hill Drive, Golden Gate Terrace, and Sutton Way (Stantec 2016).

Preparation of a Water Supply Assessment (WSA) pursuant to Section 10912 of the California Water Code is not required for the proposed project. A formal WSA is required for residential developments of more than 500 dwelling units, shopping centers or business establishments employing more than 1,000 persons or having more than 500,000 square feet of floor space, commercial office buildings employing more than 1,000 persons or having more than 250,000 square feet of floor space and projects that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project. Alternative A does not meet the thresholds requiring a formal WSA.

In 2015 NID's customers used 126,653 acre/feet/year (AFY) of water (Brown and Caldwell 2016, p. 3-2). NID projects the minimum water supply available for 2016, 2017, and 2018 estimated based on combined availability of all water sources to be 233,225 AFY (2016), 253,185 AFY (2017), and 202,611 AFY (2018) (Brown and Caldwell 2016, p.7-6). Applying water generation rates from the City's Water System Master Plan, the proposed project is expected to use 38.08 AFY. Based on NID'S demand in 2015, and the projected supply through 2018, NID would have adequate water supply for the proposed project. Impacts on existing water supplies from the proposed project would be **less than significant**.

Alternative B

Alternative B would develop more residential units and less commercial space. This would increase the demand for water compared to Alternative A. However, as shown in Table 14-5, Alternative B would result in a total water demand of 43.68 AFY. Based on NID's projected minimum water supply of at least 200,000 AFY and usage in 2015 of 126,653 AFY, the additional demand of 43.68 AFY that would be created under Alternative B, this alternative would have a **less-than-significant** impact to water supplies.

Impact 14-2: Would the project result in inadequate water supply and distribution infrastructure requiring construction of new facilities in the cumulative scenario

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

The geographic area for consideration of cumulative impacts associated with water supply is the entire NID service area. As detailed in the NID UWMP, NID has sufficient water supplies to meet the anticipated future water demands in normal~~, single dry year, and multiple dry~~ water year conditions through the year 2040. For 2020 to 2040, NID predicts a reasonable supply in normal water years of 360,800 AFY, although the district would have rights to 479,756 AFY. Table 14-1 shows the projected increased demand from 2020 to 2040, with an anticipated total demand in 2040 of 209,521 AFY. When comparing the future demands to the future projected supplies, NID would have an annual surplus in normal water years. However, as shown in Table 14-2, the UWMP anticipates a shortfall in water supply during single dry year and multiple dry year conditions in the years 2035 and 2040. ~~Therefore, NID is anticipated to have more than sufficient water to meet the needs of its customers, and this project, through 2040.~~ Therefore, there is a significant cumulative impact~~s~~ related to water supply in the NID service area ~~would be **less than significant**, and there is no significant cumulative impact to which the project would contribute~~.

Although the UWMP identifies potential shortfalls in water supply under the single dry and 4th year of multiple dry water year conditions, NID has several approaches to manage water supply and demand to reduce or avoid treated water shortages in dry years. As documented in the UWMP, NID has rights to water from the Bear River and South Yuba River. Because NID is not the senior water right holder, none of the water supply available to NID from these sources has been included in the UWMP water supply projections. However, the UWMP documents that it is likely that NID will receive at least a portion of their rights to water from the Bear River and South Yuba River. This would reduce the potential water shortage in single dry and multiple dry years. Additionally, NID is in the assessment stages of planning for a new water supply reservoir that would provide additional supplies during multiple dry water years.

Further, NID data on water consumption as reported in the UWMP demonstrates that the education and outreach efforts undertaken to reduce water usage in dry years has been successful. For example, UWMP Table 4-3 shows that the average per capita water consumption in 2015 was approximately 36% lower than the interim target per capita water consumption for the same year. This was due to the drought conditions, the Governor's Executive Order, and water conservation standards promulgated by the State in response to the drought. Chapter 7 of the UWMP presents

NID's Water Shortage Contingency Planning. This chapter notes that NID "did significant outreach in an attempt to achieve" the conservation required by the Governor's Executive Order in 2015 and that continued conservation to achieve a 33% reduction in water consumption for the year 2016 was ongoing. UWMP states that the water shortage contingency planning corresponds to the five stages of the drought identified in UWMP Table 7-1, and explains the process by which NID determines what stage will apply to a given year: "Prior to the beginning of the irrigation season, but no later than April 1 of each year the District evaluates its current reservoir storage, forecasted runoff, and purchase options from PG&E to determine what water supply stage will apply during the year." UWMP Table 7-2 defines specific water use restrictions and prohibitions that apply in each water supply stage while Table 7-3 defines consumption reduction methods that NID will implement when water supplies are reduced. Finally, UWMP Section 8.4 details the public education and outreach efforts that NID implements annually (regardless of any water supply limitations) to promote water conservation.

The anticipated water demand from the proposed Dorsey Marketplace project would not substantially exceed that assumed under the UWMP. The anticipated district-wide increase in water demands reflect buildout of the City's General Plan, including commercial uses at the project site (under the site's existing Business Park land use designation) and other projects in the NID service area, such as Loma Rica Ranch and development within unincorporated portions of Nevada County. The domestic water demand projections relied upon in the UWMP assume an annual population growth rate of 2.4%. As discussed in Chapter 4, Population, Employment, and Housing, the project is not expected to create population growth that is inconsistent with the City's General Plan. Thus the population growth supported by the project would not exceed the population projections on which the UWMP is based.

Under the existing Business Park land use designation, the assumed water usage for the project site would be 32.97 AFY, based on the commercial water demand rate of 1,100 gpd/ac. Under Alternative A, the project site water demand is projected to be 38.08 AFY, or 5.11 AFY greater than the UWMP. Under Alternative B, the water demand is projected to 43.68 AFY, or 10.71 AFY greater than the UWMP. These water demand projections rely on the existing calculated water demand per residential unit within the NID service area. However, the existing demand per unit does not reflect compliance with ~~The UWMP also notes that water savings from~~ codes, standards, ordinances, and land use plans generally decrease the water use for new and future customers, compared to historical customers. Domestic ~~W~~water use in the ~~Nevada Irrigation District~~NID service area ~~has~~ declined by approximately ~~more than 20~~18% between 2013 and 2018~~7~~ (~~Southern California Public Radio~~ NID ~~2017~~2019). NID anticipates water usage to decrease even more going forward with the addition of the Model Water Efficient Landscape Ordinance, California Energy Commission Title 20 appliance standards, and CALGreen Building Code. Specifically, the UWMP states that compliance with the CALGreen Building Code "requires residential and non-residential water efficiency and conservation measures for new buildings and structures. It is assumed that this

code will reduce residential and non-residential indoor water on new construction by up to 20 percent" (Brown and Caldwell 2016). The assumed water demand per residential unit reflects the average water demand from all residences within the NID service area, which includes a mixture of single-family and multifamily units. Water demand for multifamily units is typically much lower than for single-family units, particularly due to the reduced water usage for landscaping maintenance. These factors indicate that the actual water demand for the proposed project under either Alternative A or Alternative B would not substantially exceed the water demand assumed for the project site under the UWMP. Thus although NID projects water shortages in single dry and multiple dry water years, which indicates a significant impact in the cumulative scenario, the proposed project would not alter the UWMP water supply and demand projections and the proposed project would not make a substantial contribution to the potential water shortages in the cumulative scenario.

Impact 14-3: Would the project exceed existing treatment, collection, and disposal facilities, resulting in the need for expansion or new wastewater infrastructure

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

The Grass Valley WWTP would serve the project site. The commercial and high-density residential uses at the project site are expected to generate an ADWF of 0.031 mgd. With an existing capacity of 2.78 mgd and existing ADWF of 1.3 mgd (Stantec 2016), the Grass Valley WWTP has sufficient capacity to treat wastewater generated at the project site. The additional 0.031 mgd of wastewater from the proposed project would not exceed capacity of the WWTP.

Sewer flows from the site would be conveyed to the WWTP through a sewer collector line in Spring Hill Drive, which flows to the Idaho Maryland Trunk line, and then through the Main Trunk line from its connection to the Idaho Maryland trunk line to the WWTP. Wastewater generated at the site would be conveyed by gravity through the Spring Hill Drive sewer collector. The Sewer Capacity Assessment concludes that the existing 8-inch line has sufficient capacity to handle sewer flows from the proposed project, and that the line should be extended through the project site with a minimum slope of 0.00035 (Appendix L, Exhibit A). The Idaho Maryland Trunk sewer line ranges from 15 to 18 inches, and connects to the city's Main Trunk sewer where Idaho-Maryland Road intersects East Main Street. The Main Trunk is aligned roughly parallel to SR 20/49 and ultimately conveys flows to the City's WWTP (Appendix L). The Sewer Capacity Assessment for the project concluded that the addition of the proposed project is not expected to cause any new sewer segments to exceed capacity of the infrastructure but that the additional contribution from the project would slightly increase the existing full condition of the sewer trunk lines that are operating at or near capacity (Appendix L). The Sewer Capacity Assessment concluded that in the existing plus project condition:

- No surcharging in the Idaho Maryland Trunk is expected to occur and the maximum increase in HGL is expected to be 0.09 feet. Further, the existing deficiencies in the Idaho Maryland Trunk upstream of the Spring Hill Drive collector would not be exacerbated by the proposed project.
- No surcharging in the Main Trunk is expected to occur. The maximum increase in HGL is expected to be 0.28 feet.
- No surcharging in the Spring Hill Drive collector is expected to occur and this collector is predicted to have remaining capacity after addition of the flows from the proposed project.

Overall, the proposed project would not exceed existing treatment, collection, and disposal facilities, resulting in the need for expansion or new wastewater infrastructure. Impacts would be **less than significant**.

Alternative B

The commercial, office, and high-density residential uses under Alternative B are expected to generate an ADWF of 0.035 mgd. With an existing capacity of 2.78 mgd and existing ADWF of 1.3 mgd (Stantec 2016), the Grass Valley WWTP has sufficient capacity to treat wastewater generated at the project site. The additional 0.035 mgd of wastewater from the proposed project would not exceed capacity of the WWTP. The Sewer Capacity Assessment for the project concluded that the addition of the proposed project is not predicted to cause any additional sewer segments to exceed capacity of the infrastructure, consistent with the summary provided in the previous Alternative A discussion (Appendix L). Overall, the proposed project would not exceed existing treatment, collection, and disposal facilities, resulting in the need for expansion or new wastewater infrastructure. Impacts would be **less than significant**.

Impact 14-4: Would the project exceed existing treatment, collection, and disposal facilities, resulting in the need for expansion or new wastewater infrastructure in the cumulative condition

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

As discussed previously, wastewater from the project site would be collected by the City and conveyed to the Grass Valley WWTP, which has a capacity of 2.78 mgd. The cumulative context for impacts associated with wastewater conveyance and treatment is full buildout of the City's 2020 General Plan, including all Areas of Concern. The City anticipates a future ADWF of 1.6 mgd with development of vacant parcels within City limits, 1.9 mgd in the near term (5 years),

and 2.1 mgd in the long term (10 years) (Stantec 2016). By the full buildout growth horizon, which includes all additional lands identified by the 2020 General Plan including the Special Development Areas of North Star and Kenny Ranch and the balance of the Berriman Ranch and adjacent property area, as well as all Areas of Concern identified in the 2020 General Plan, the ADWF is projected to reach 4.0 mgd (Stantec 2016). In the near-term growth condition, the near- and long-term growth condition, and the full buildout growth condition, storm events could cause peak flows that result in surcharging in several reaches of the wastewater collection system. This includes surcharging from the Main Trunk line, which consists of two parallel 18-inch lines. As shown in Table 5 of the Sewer Capacity Assessment, the surcharging is expected to occur at four manhole locations, with surcharging depth ranging from 1.27 feet to 4.13 feet under the following development scenarios: existing plus proposed project plus development of vacant parcels, existing plus proposed project plus near term development, and buildout plus the proposed project. Future conditions are also expected to include surcharging from four manhole locations on the Idaho Maryland Trunk, as shown in Table 6 of the Sewer Capacity Assessment. In the long term development plus proposed project condition, one location would have a peak surcharge of 1.48 feet. In the buildout plus proposed project condition, three locations would have peak surcharges ranging from 1.6 feet to 2.38 feet.

The Sewer Capacity Assessment calculates the percentage of peak flow attributable to the proposed project that contributes to surcharging, above the existing peak flow conditions, for Near Term and Long Term Conditions. One location, manhole I17-7, is the only manhole that conveys Dorsey Marketplace flows and fails the City's service criteria under Near Term conditions. The percent of peak flow attributable to the proposed project is 12.6%. This was determined by dividing the amount of peak flow in the manhole due to proposed project by the peak flow being contributed by all Near Term development (including the proposed project but excluding all existing flows).

There are three locations in the Long Term conditions where the proposed project would contribute to anticipated surcharging. The percentage of new flow that the proposed project would contribute at each location ranges from 11.2% to 15.5%, as shown in Table 7 of the Sewer Capacity Assessment.

The City's Wastewater Master Plan outlines an improvement plan with alternatives that address the deficiencies of the existing wastewater collection and treatment facilities. The plan includes four alternatives for each stage described above to accommodate the projected ADWFs of 1.6 mgd, 1.9 mgd, and 2.1 mgd. All of the alternatives will address the projected deficiencies. The Wastewater Master Plan indicates that one of the two 18-inch lines that comprise the Main Trunk would be upsized to 24 inches or an additional line would be added. Additionally, the City is currently planning to implement an inflow and infiltration (I/I) reduction project in targeted areas of the collection system. This I/I reduction project would not increase the capacity of the City's system; however, peak flow sewer capacity may be restored as I/I is reduced. (Stantec 2016)

The WWTP NPDES permit, Order No. R5-2009-0067 (revised and renewed in February 2016), allows for the discharge of effluent to Wolf Creek.

The proposed project would contribute to cumulative wastewater impacts. However, the project's contribution of 0.031 mgd under Alternative A and 0.035 mgd under Alternative B is minimal, and would not exceed the projected ADWF flows through the long term horizon. Because the City plans to address the projected deficiencies through the full buildout horizon, the project's contribution to cumulative wastewater impacts would be **less than significant**.

Impact 14-5: Would the project result in an increased demand for gas or electricity requiring new production facilities

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Under either Alternative A or Alternative B the project would increase energy use in the area to support the proposed commercial, residential, and office (Alternative B only) uses. Chapter 16 provides a summary of the project's anticipated energy needs, impacts, and conservation measures, in accordance with Appendix F of the CEQA Guidelines. The demand for electricity resulting from development of the proposed project would not require new production facilities. Title 24 of the California Code of Regulations ensures minimal increases in energy demands by requiring the use of energy-efficient appliances in all new residential, commercial, and educational facilities. Compliance with Title 24 would ensure that energy use at the project site is minimized. The project applicant would be responsible for the costs associated with extension of electrical service infrastructure to the project site. Based on the existing capacity within PG&E's system and the energy demand associated with the proposed project, impacts related to requiring construction of new energy production facilities would be **less than significant**.

Impact 14-6: Would the project result in an increased demand for gas or electricity requiring new production facilities in the cumulative condition

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

The cumulative context for impacts associated with electricity demand is buildout of the City's General Plan and the other projects discussed in Chapter 3, Land Use. This area is within the

service area of the Sacramento-Sierra Division of PG&E. All new development within the service area must meet the energy efficiency requirements of Title 24 of the California Code of Regulations. Additionally, PG&E offers several energy efficiency programs and incentives to help all customers, including residential, commercial, and agricultural customers, reduce their water and energy usage, and cut their energy costs. The Title 24 requirements and PG&E's ongoing efforts to improve energy efficiency in the region would ensure that energy use in the cumulative scenario is minimized such that substantial new sources of energy generation are not needed. Thus, cumulative impacts would be **less than significant**.

Impact 14-7: Would the extension of dry utility infrastructure to the site that could cause significant environmental impacts

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Electric and gas service connections would be provided to the site from the existing transmission network in the project vicinity. As the site is surrounded by development, existing power and natural gas lines exist in the immediate vicinity of the site. Construction and installation of electricity and gas lines within the project site could contribute to physical impacts associated with construction activities, including air pollutant emissions, soil erosion, and reduced quality of stormwater runoff. Grading and construction activities associated with the provision of these services to the proposed residences are reflected on the proposed grading plans, and the impacts associated with these activities are evaluated throughout the resource sections of this Draft EIR. With implementation of the construction-related best management practices (BMPs) and adherence to the City's policies identified throughout other sections in this EIR, it is expected that impacts from construction and installation of dry utilities would be **less than significant.**

Impact 14-8: Would the extension of dry utility infrastructure to the site that could cause significant environmental impacts in the cumulative condition

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	No impact	No impact
Mitigation measures:	None required	None required
Significance after mitigation:	No impact	No impact

Alternative A and Alternative B

Extension of dry utility infrastructure within the project site would occur only at the time of project construction. While other development projects in the area would also be required to

extend dry utility infrastructure to other project sites, the impacts, such as temporarily increased noise levels, and would not combine with other past, present, or reasonably foreseeable project impacts. Thus there would be **no significant cumulative impact** to which the project could contribute.

Impact 14-9: Would the project conflict with school district ability to provide educational services or create a substantial increase in school population?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A

The proposed project would result in an increase in the existing student population. As discussed in Section 14.1, Environmental Setting, three elementary schools in the Grass Valley Elementary School District are within two miles of the project site. The district has seen a slight increase in students since 2005. Enrollment increased slightly from 1,663 students in the 2010–2011 school year to 1,745 students for the 2015–2016 school year (California Department of Education 2017a). The district has a capacity of 2,189 students (Hardy 2017). High school students from the project site would likely attend Nevada Union High School, which is approximately one mile from the project site. The Nevada Joint Union High School District has seen steadily declining enrollment since 1998 (California Department of Education 2017c). Nevada Union High School has a total enrollment of 1,653 for the 2015–2016 school year (California Department of Education 2017d) and a capacity of 2,814 (Nevada Joint Union High School District 2017).

The Nevada Joint Union High School District uses a student yield factor of 0.20 for multi-family dwelling units (Zeisler 2017). For the 90 units planned in Alternative A, the project would generate 18 new high school students. With generous capacity at Nevada Union High School, the additional 18 students anticipated from the proposed project would not exceed capacity at the school.

The Grass Valley Elementary School District uses a student yield factor of 0.50 students in grades K-6 and 0.50 students in grades 7-8 for multi-family dwelling units. For the 90 units planned in Alternative A, the project would generate 45 new K-6 grade students and 45 new 7-8 grade students. The available capacity within the Grass Valley Elementary School District is sufficient to accommodate these students.

Government Code 65996 requires the project applicant to pay impact fees to the school districts at the time of construction to offset increased student enrollment. As provided in the Government Code, payment of these fees constitutes adequate mitigation of impacts to the provision of school facilities. The applicant would be required to pay school impact fees of $3.48 per square foot for residential

development and $0.56 per square foot for commercial and industrial development to the Grass Valley Elementary School District and the Nevada Joint Union High School District (Hardy 2017). Specific school facility developments would be subject to CEQA review on a project-by-project basis. Payment of the school impact fees, which would occur at the time building permits are issued, would ensure impacts associated with the addition of students to the over-capacity elementary and high schools would be **less than significant.**

Alternative B

Alternative B would develop 1721 multi-family residential units, which would generate 34 new high school students, 876 new K-6 students, and 876 new 7-8 grade students. There is sufficient capacity at Nevada Union High School and within the Grass Valley Elementary School District to accommodate these students. Payment of the school impact fees, which would occur at the time building permits are issued, would ensure impacts associated with the addition of students to the over-capacity elementary and high schools would be **less than significant.**

Impact 14-10: Would the project conflict with school district ability to provide educational services or create a substantial increase in school population in the cumulative condition?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

The cumulative context for impacts to schools is the district boundaries for the Grass Valley Elementary School District and the Nevada Joint Union High School District. With the expected growth in and surrounding Grass Valley, as discussed in Chapter 3, including the Loma Rica Ranch Specific Plan, the Grass Valley Elementary School District could be over capacity. Anticipated physical modifications to the Grass Valley Elementary School District include replacing existing portables with permanent construction, and construction of a new gym or cafeteria. The on-site improvements would not contribute to significant environmental effects; they would occur in areas already paved or within/adjacent to the athletic fields. Further, these improvements would be funded through developer impact fees to adequately address the project's fair share of demand for increased capacity. Therefore, while there may be temporary impacts related to school overcrowding, the cumulative impact would be **less than significant**.

The proposed project would contribute to the increased demands and capacity constraints of the local school districts in the cumulative scenario. As projects are approved and constructed within and around Grass Valley, coordinated planning efforts will need to continue to implement the

expansion of facilities. The Nevada Joint Union High School District and Grass Valley Elementary School District share school impact fees. According to California Government Code Section 65996, SB 50 funding represents mitigation for the impacts on schools. Pursuant to state law, payment of statutory fees represents full and complete school facilities mitigation. Per California Government Code Section 65995(h) and Section 65996(b), the existing fee mechanisms would fully mitigate the financial effects of the student population associated with the proposed project. Thus the project's contribution to the cumulative impact would not be cumulatively considerable and this impact would be **less than significant**.

Impact 14-11: Would the project result in an increased demand for library services?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A

The Nevada County Library System operates one library within City boundaries, at 207 Mill St., approximately 1.25 miles southwest of the project site, along with five other libraries within the county. The Grass Valley Library serves a population of approximately 12,860 people (U.S. Census Bureau 2010). Alternative A would result in the addition of 184 residents to the City, which is a 1.4% increase in total population. It is expected that the library services demands of the project residents would be minimal and would be accommodated by the existing Nevada County Libraries.

The City's goal for library services is to maintain 500 square feet of library space per 1,000 population (City of Grass Valley 1998). The population of the proposed project would represent a demand for 92 square feet of library space. These demands are not sufficient to require construction of new or expanded library facilities. Revenue generated by the proposed project in the form of special taxes, assessments, and fees would cover the costs of providing library services to the project's residents, including costs of acquiring new volumes for the library collection. All required fees and taxes paid by the developer and each future lot owner would ensure that project impacts to library services within the City would be **less than significant**.

Alternative B

Alternative B would result in the addition of ~~349~~ 351 residents to the City, which is a 2.7% increase in total population, and would represent a demand for 175~~4~~.5 square feet of library space. It is expected that the library services demands of the project residents would be minimal and would be accommodated by the existing Nevada County Libraries. All required fees and taxes paid by the developer and each future lot owner would ensure that project impacts to library services within the City would be **less than significant**.

Impact 14-12: Would the project result in an increased demand for library services in the cumulative condition?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

The cumulative context for consideration of impacts to libraries is buildout of the City of Grass Valley and the other regional projects discussed in Chapter 3, Land Use. Under Alternative A, the project residents would create a demand for 92 square feet of library space while a demand for 174.5 square feet of space would be created by Alternative B. The six libraries nearest the City and within Nevada County would be sufficient to serve the population of the area, including the minor additional demand created by the proposed project. Thus, the potential cumulative impact would be **less than significant**.

Impact 14-13: Would the project result in a need to construct new or expand existing parks and facilities?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A

The City's Parks and Recreation Master Plan includes park standards per 1,000 residents, as shown in Table 14-4. The Grass Valley Subdivision Ordinance provides for land dedication for parks and recreation, and for in-lieu fees through which residential developments might facilitate park land acquisition. The standard for park and recreation dedications or in lieu fees, established under provisions of the "Quimby Act" (Section 66477 of the State Government Code), is a maximum of 5 acres per 1,000 population. Alternative A would accommodate 184 residents, and would therefore be required to provide 0.92 acres of parkland to satisfy the Quimby Act. The project would include a tot park and a dog park, which would meet a portion of the passive recreation needs of the project site residents.

As discussed in Section 14.1, Environmental Setting, the City exceeds its park standards of providing between 5 and 8 acres per 1,000 population for community parks but does not meet its standard of 1 to 2 acres per 1,000 population for neighborhood parks (City of Grass Valley 2001). However, the City has developed Mautino Park (community park) and plans to develop Morgan Ranch Park (neighborhood park). Morgan Ranch has been dedicated to the City and remains open space.

Given the current shortage of park space and the lack of new park space within the proposed site plan, Alternative A has the potential to increase the demand for community and regional parks in the City, which could accelerate or result in their physical deterioration. The Grass Valley Municipal Code provides for the City to require the project applicant to pay parkland dedication and park facilities fees at the time that building permits are issued to fully meet the City's park development standards, consistent with the General Plan. This would ensure that the project impacts associated with environmental effects due to increased use of existing parks, park facilities, and open space within the City would be reduced to **less than significant**.

Alternative B

Alternative B would accommodate ~~349~~ 351 residents, which would correlate to a demand for 1.76~~5~~ acres of parkland. Given the current shortage of park space and the lack of new park space within the proposed site plan, Alternative B has the potential to increase the demand for community and regional parks in the City, which could accelerate or result in their physical deterioration. Payment of parkland dedication and park facilities fees to the City at the time that building permits are issued, as required by the Grass Valley Municipal Code would ensure that this impact remains **less than significant**.

Impact 14-14: Would the project result in a need to construct new or expand existing parks and facilities in the cumulative condition?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

The geographic area for consideration of cumulative impacts related to parks and recreation is buildout of the City of Grass Valley General Plan and other development identified in Chapter 3. Under the General Plan, all projects in the area would be required to provide a minimum of 5 acres of parks and 5 acres of open space for every 1,000 people supported by the project. Where a proposed project does not provide sufficient park acreage to meet its required parkland dedication, the project applicant may pay the City's parkland dedication in-lieu fee. This provides for each project applicant to contribute a fair share amount toward establishment of parks and open space and, thus, the cumulative impact would be **less than significant.**

Impact 14-15: Would the project result in an increased demand for fire protection and emergency services requiring new facilities or reducing overall fire protection?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Development of the proposed project is likely to result in an increased demand for fire protection and emergency services. The proposed project site is in the jurisdiction of the GVFD, which provides fire protection and emergency medical services in the project area. The project proposes residential and commercial development (and office development under Alternative B) in an area adjacent to existing urbanized land uses. The project is not expected to substantially increase the risk of fire in the area.

The GVFD partners with the Nevada County Consolidated Fire Department and the Nevada City Fire Department under a Joint Operating Agreement and Automatic Aid Agreement, which allow for the nearest engine to an incident to respond and for a response by a minimum of two pieces of equipment within four minutes. The City uses a planning ratio of 1.73 paid fire protection staff per 1,000 population. While the GVFD's fulltime staff of 14 firefighters does not meet that ratio for the City's approximate population of 12,860 people (U.S. Census Bureau 2010), when combined with the other local departments and the agreement to a response time of four minutes, the fire fighting and emergency medical response in the City is adequate.

Alternative A would include 90 multi-family residential units that have the potential to increase the City's population by approximately 184 residents while Alternative B would include 172~~1~~ multi-family residential units housing 351~~49~~ residents. This would create a demand for 0.32 new firefighters under Alternative A and 0.6 new firefighters under Alternative B. This additional personnel demand would not require construction of any new GVFD facilities.

The GVFD charges fees for various inspections, building plan reviews, hydrant inspections, etc. (City of Grass Valley 2017b). Additionally, Measure E, adopted in 2018, redirects 1 cent of sales tax to provide improvements to existing parks and new park facilities, plus fire, police and road/sidewalk improvements. Per the City's General Plan, existing standards for development that are expected to provide adequate access, fire flows, and other facilities to maintain an appropriate level of fire protection will continue to derive from the California Building Code, the California Fire Code, and the California Mechanical Code. Safety Policies 6 and 9 would incorporate fire hazard reduction considerations into land use plans and patterns, and develop and implement fire-safe community design and landscaping standards, construction codes, and property maintenance

regulations. The project would not require the fire department to travel to remote locations because it is infill development; therefore, the project is not expected to lengthen response times to levels above GVFD standards. No improvements or additions to GVFD facilities would be necessary as a result of this project. This impact would be **less than significant**, and no mitigation is required.

Impact 14-16: Would the project interfere with emergency response or evacuation or increased demand for fire protection and emergency services requiring new facilities or reducing overall fire protection in the cumulative condition?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

The cumulative context for consideration of impacts to emergency response and fire protection is buildout of projects within the jurisdiction of the GVFD. Prevention of emergency access or evacuation is typically related to physical improvements constructed within a project site. These types of impacts are site-specific and do not combine with other offsite impacts to create a larger cumulative impact. Per the City's General Plan, existing standards for development that are expected to provide adequate access, fire flows, and other facilities to maintain an appropriate level of fire protection will continue to derive from the California Building Code, the California Fire Code, and the California Mechanical Code. Safety Policies 6 and 9 would incorporate fire hazard reduction considerations into land use plans and patterns, and develop and implement fire-safe community design and landscaping standards, construction codes, and property maintenance regulations. Safety Policy 11 requires the City to maintain appropriate standards for water supply, pressure, and distribution for fire suppression purposes. Circulation policy 24 also requires circulation and development plans be coordinated with public safety agencies, fire departments/districts, and emergency service providers. By complying with these requirements, each project would avoid creating obstacles to the routine extension of fire protection and emergency services in the vicinity.

As development continues in the area, the increased population could warrant improvements to the GVFD facilities and/or acquisition of new equipment and new staff. It could also warrant increased responses from neighboring fire districts. It is assumed that new development would within the GVFD service area would increase the total revenue that the GVFD collects through parcel taxes and fees for various inspections, building plan reviews, hydrant inspections, etc., which would provide funding to the GVFD to handle the cumulative increase in demand. Therefore, cumulative impacts would be **less than significant.**

Impact 14-17: Would the project require new law enforcement facilities?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Alternative A would establish 90 new dwelling units resulting in about 184 residents, as well as 178,960 square feet of new commercial/retail space within the City. Alternative B would establish 172~~1~~ new dwelling units resulting in 351~~49~~ new residents, 8,500 square feet of new office space, and 104,350 square feet of new commercial/retail space. The project area is currently served by the GVPD. The Department's headquarters are about one mile southwest of the project site. The slight increase in population under either Alternative A or Alternative B would be expected to generate a minimal increase in the demand for law enforcement services, but it is not anticipated to generate sufficient demand to require construction of new law enforcement facilities. This impact would be less than significant, and no mitigation is required.

Impact 14-18: Would the project interfere with the ability to provide law enforcement services?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

The design of the proposed project under either Alternative A or Alternative B would not create any obstacles to the provision of law enforcement services to the project site or to surrounding land/land uses. Roadway access is provided to all portions of the project area. The proposed project is expected to have no impact associated with creation of a physical obstacle to law enforcement.

Alternative A would add approximately 184 new residents and 178,960 square feet of commercial retail space. Alternative B would add ~~349~~ 351 new residents, 8,500 square feet of new office space, and 104,350 square feet of new commercial/retail space. In accordance with Ordinance 441 Section 1-6, 1990 of the City's Municipal Code, the City may choose for developer fees that contribute to the city's capital improvement program to also serve improvements for the City's police service. All required fees would be paid by the developer to the City. Additionally, the City passed Measure N in 2012, a half-cent sales tax increase which supports police, fire, and public work services. Further, Measure E, adopted in 2018, redirects 1 cent of sales tax to provide improvements to existing parks and new park facilities, plus fire, police and road/sidewalk improvements. Therefore, taxes on additional commercial retail sales included in the proposed project would also contribute to those

services. Since the project is not expected to present physical obstacles for law enforcement officers responding to calls, or require law enforcement officers to travel to remote locations (infill development), the project is not expected to substantially increase existing response times. Further, it is not expected that construction of any new facilities (which could result in additional environmental effects) would be needed. The slight population increase added by the proposed project would not warrant a need for construction of any new facilities to allow GVPD to provide sufficient services to the project site. Therefore, impacts related to law enforcement response times and physical improvements needed to support law enforcement service to the site would be **less than significant**.

Impact 14-19: Would the project contribute to the need for new law enforcement facilities or interfere with law enforcement response in the cumulative condition?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Anticipated development within the city of Grass Valley as discussed in Chapter 3, and development in the areas immediately surrounding the city define the cumulative condition for this impact. Prevention of emergency response is typically related to physical improvements constructed within a project site. These types of impacts are site-specific and do not combine with other off-site impacts to create a larger cumulative impact.

It is expected that call volume for law enforcement services would increase proportionally to the increase in population in the cumulative scenario. As development continues in the area, the increased population could warrant improvements to the GVPD facilities and/or acquisition of new equipment and new staff to ensure that service within the City limits remains sufficient. The demand would increase over time as projects are constructed and occupied; at the same time the development impact fees paid by developers and additional property taxes generated by development would provide funding to the City that could be used to fund additional GVPD staff to handle this increase in demand. Therefore, cumulative impacts would be **less than significant.**

Impact 14-20: Would the project generate waste of a daily volume that cannot be accommodated by the materials recovery facility?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Alternative A would add approximately 184 new residents and 178,960 square feet of commercial retail space. Alternative B would add ~~349~~ 351 new residents, 8,500 square feet of new office space, and 104,350 square feet of new commercial/retail space. Using generation rates from CalRecycle, as shown in Table 14-6, the combined residential and commercial/retail space under Alternative A would produce about 8,710~~58~~ pounds or 4.38 tons of solid waste per day. The land uses proposed in Alternative B would produce about 5,764~~91~~ pounds or 2.88~~90~~ tons of solid waste per day.

Based on the average solid waste collection at the McCourtney Road Transfer Station of 291 tons per day and the permitted capacity of 350 tons per day, the generation of 4.38 daily tons of solid waste under Alternative A or 2.88~~90~~ daily tons of solid waste under Alternative B is not expected to significantly affect the overall capacity or lifespan of the transfer station. Based on a conservative estimate using the 960 peak vehicle trips and average waste received, each vehicle is estimated to deliver a third of a ton of waste per trip. Therefore, ~~the~~ Alternative A ~~proposed project~~ could increase ~~the~~ daily trips by about 14 vehicles and Alternative B could increase daily trips by about 9 vehicles. The project's annual generation of ~~a maximum of~~between 4.38 and 2.88 tons and between 14 and 9 new vehicle trips would not exceed the capacity of the McCourtney Road Transfer Station. However, the facility is nearing capacity, and has been in the design phase for an upgrade since 2012 (Simpson 2017). The project would also not exceed the capacity of the Lockwood or Anderson Landfills: the Lockwood Landfill had a remaining capacity of 269.7 million cubic yards in 2010 (Nevada Division of Environmental Protection 2015) while the Anderson Landfill has an approximate capacity of 11.5 million cubic yards (RBF Consulting 2013).

The proposed project would be required to comply with the City's Grass Valley Solid Waste/Recyclable Materials Storage Ordinance, which requires developers of new construction projects to provide solid waste and recyclables storage areas. The project would also comply with Nevada County's adopted Source Reduction and Recycling Element that establishes goals and methodologies for compliance with AB 939.

The McCourtney Road Transfer Station and the Lockwood and Anderson Landfills would be able to accommodate the proposed project's waste. Additionally, these waste generation estimates are

conservative because they do not include recycling diversions. Therefore, the proposed project would be served by landfills with sufficient permitted capacity to accommodate its solid waste disposal needs and impacts would be **less than significant**. No mitigation is required.

Impact 14-21: Would the project generate waste of a daily volume that cannot be accommodated by the materials recovery facility in the cumulative condition?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

Ongoing development in and surrounding the City of Grass Valley, and development throughout Nevada County, would contribute solid waste and vehicle trips to the McCourtney Road Transfer Station, which is already nearing capacity, as described previously. Because the Lockwood and Anderson Landfills each have remaining capacity of 291 million cubic yards, ongoing development in the region is not expected to exceed capacity. The County is in the design phase of an upgrade to the McCourtney Road Transfer Station, which would allow the facility to accommodate more waste. With implementation of an expansion to the transfer station's permitted capacity and vehicle trips, cumulative impacts related to solid waste disposal would be **less than significant.**

14.4 MITIGATION MEASURES

All impacts associated with public services and utilities were determined to be less than significant. No mitigation measures are required.

14.5 REFERENCES CITED

Brown and Caldwell. 2016. Nevada Irrigation District 2015 Urban Water Management Plan. June 2016.

CalRecycle. 2016. Estimated Solid Waste Generation Rates. https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates. Accessed February 9, 2017.

CalRecycle. 2017. Facility/Site Summary Details: McCourtney Road Large Volume T.S. http://www.calrecycle.ca.gov/SWFacilities/Directory/29AA0010/Detail/. Accessed February 9, 2017.

City of Grass Valley City Parks Department. 2017. Accessed January 31, 2017. http://www.cityofgrassvalley.com/departments/parks-and-rec/city-parks

City of Grass Valley. 2011. Draft Environmental Impact Report for the Proposed Grass Valley Redevelopment Plan Fourth Amendment. January 2011.

City of Grass Valley. 2001. Grass Valley Parks and Recreation Master Plan. February 2001.

Ghidotti. 2017. School Profile 2016-2017. 2017.

Kleinschmidt. 2011. NID Raw Water Master Plan Phase II. December 2011.

Nevada Irrigation District (NID). 2019. Comments Regarding the Notice of Completion of the Draft Environmental Impact Report for the Dorsey Marketplace Project. May 2019.

Stantec. 2016. City of Grass Valley Wastewater System Master Plan. August 23, 2016.

CHAPTER 15
HAZARDS AND HAZARDOUS MATERIALS

This section describes the potential adverse effects on human health and the environment due to exposure to hazards that could result from implementation of the Dorsey Marketplace Project (proposed project). Hazards evaluated include those associated with hazardous materials including potential exposure to hazardous materials used, generated, stored or transported in or adjacent to the project site; and existing identified or suspected soil and/or groundwater contamination.

For the purposes of this environmental impact report (EIR), the definition for the term "hazardous materials" is taken from the California Health and Safety Code, Section 25501(o), where the term is defined as 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."

Similarly, the term "hazardous waste" is a subset of hazardous materials; its definition is derived from the California Health and Safety Code, Section 25517, and the California Code of Regulations, Title 22, Section 66261.2, which defines hazardous waste as material that "because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either cause, or significantly contribute to, an increase in mortality or serious illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed."

Sources received to prepare this section include the following:

- *City of Grass Valley 2020 General Plan* (City of Grass Valley 1999a)
- *City of Grass Valley General Plan Update Environmental Impact Report* (City of Grass Valley 1999b)
- Grass Valley General Plan Background Report (Quad Knopf 1998)
- *Preliminary Geotechnical Engineering Report for Former Spring Hill Mine Property APNs 35-260-62, 63, and 64 Grass Valley, California* (Appendix J-1)
- *Preliminary Endangerment Assessment for Former Spring Hill Mine Property APNs 35-260-62, 63, and 64 Grass Valley, California* (Appendix J-2)
- *Removal Action Work Plan for Spring Hill Property APNs 35-260-62, 63, and 64 Grass Valley, California* (Appendix J-3A)

No responses to the Notice of Preparation (NOP) were received regarding hazardous wastes. The NOP and comments received in response to the NOP are included in Appendix A.

15.1 ENVIRONMENTAL SETTING

Regional Setting

The City of Grass Valley (City) is located within the western edge of the Sierra Nevada within Nevada County, California. The site is located in the southern half of the southeast quarter of Section 23 and the northern half of the northeaster quarter of Section 26, Township 16 North, Range 8 East of the Grass Valley Quadrangle Topographic Map. The regional location is shown in Figure 2-1 in Chapter 2, Project Description. In the heart of the California Gold Rush, the City of Grass Valley and the greater Nevada County was historically a mining area. Redevelopment of former mining sites can raise concerns associated with soil contamination, unknown mineshafts that may result in large sinkholes, and heavy metal contaminants leaching into the groundwater and affecting human health.

Existing Site Conditions

The approximately 27-acre project site was formerly the site of the Spring Hill Mine. Previous buildings associated with the mine have been demolished, but other features still exist, including a mill foundation, horizontal and inclined excavations, pits, relic foundations, and contaminated soil – primarily in stockpiles of mine waste rock and a dry tailings pond, as shown in Figure 15-1, Spring Hill Mine Site Plan. The site contains an estimated 44,000 cubic yards of mine waste rock and 20,000 cubic yards of processed tailings, as shown on Figure 15-2, Mine Waste Assessment Areas (Appendix J-2). Several roads and trails are also located within the site, some of which may be used periodically by trespassers.

The project site is near various commercial, institutional, and residential land uses, which may generate, transport, store, treat, or dispose of hazardous waste. These include three self-storage facilities, two apartment complexes, and two medical and nursing facilities. Most fuels, lubricants, solvents, and paints used by commercial, institutional, and residential land uses are considered hazardous materials.

Historic Uses of Property

The Spring Hill Mine operated intermittently from the late 1800s to the early 1940s, and included a well-developed operational mine with two mining locations and a mill site. The project site once supported buildings, mine shafts, tailing piles, and waste dumps on the western and central portion of the property, as shown on Figure 15-1. The mine facilities were used to extract gold, quartz, talc and chlorite group throughout its years of operation, though mainly gold and quartz were targeted.

Contaminants and Removal Action Work Plan

A Preliminary Endangerment Assessment (PEA, Appendix J-2)), which included a Human Health Screening Evaluation, was conducted to evaluate the project site for potential risks to human health and the environment resulting from historical site use. The RAW notes that the PEA has been approved by the Department of Toxic Substances Control (Appendix J-3A). The RAW describes procedures for conducting remedial activities to address recognized environmental conditions associated with past site use. The RAW also describes how the contaminated soils and mine waste would be removed from the project site.

The PEA included testing more than 90 soil samples from the AOCs and 8 ambient soil samples from other portions of the site. The Spring Hill site contains three areas of concern (AOCs), two of which are listed as areas for remediation, as shown in Figure 15-3, Areas of Concern. AOC 1, the former mill area, contains the highest levels of arsenic and lead contamination. AOC 2, the remaining mine waste site located west of the former mill site, contains levels of contamination that exceed the maximum public health levels, but are less than those of AOC 1. The mine waste and affected soil in AOC 1 are not acceptable for the three exposure scenarios considered: standard (unrestricted land use), commercial indoor worker, and construction worker. The mine waste and affected soil in AOC 2 are also not acceptable for use under the standard exposure scenario. In addition to the AOCs, other metals, including antimony, copper, lead, mercury and vanadium, are also considered constituents of potential concern (COPCs). The RAW recommends excavation and off-site disposal for the waste in AOC 1. Mine waste rock and tailings in AOC 2 are considered suitable for on-site consolidation and burial beneath the proposed commercial development, and can be classified as Group C mine waste per CCR Title 27 (Appendix J-3A).

Hazardous Material Release Sites

The Spring Hill Mine is listed as a Brownfields site. The Department of Toxic Substances Control has determined the cleanup project to be a Class 30 categorical exemption under CEQA because it is a minor cleanup action that will not have an effect on the environment, given the activities outlined in the RAW (Appendix J-3B).

Several federal and state databases provide information regarding facilities or sites identified as meeting the Cortese List requirements, and regarding businesses that have had or are currently experiencing a hazardous materials release within the general vicinity of the project area. These include CERCLIS, California Department of Toxic Substances Control's (DTSC) Envirostor, Geotracker (the leaking underground storage tank (LUST) database), Toxic Release Inventory database (TRI), the List of Active Cease and Desist Orders and Cleanup and Abatement Orders, and EnviroMapper.

The proposed project is not listed on the CERCLIS website, although Empire Mine State Park and the Idaho Maryland Mine property (just south of the project site) are listed as Superfund sites on the CERCLIS website (U.S. Environmental Protection Agency 2016a). The project site, Spring Hill Mine, is listed as an active voluntary cleanup site on the EnviroStor website (DTSC 2018). The EnviroStor website lists four sites in Nevada County on its Hazardous Waste And Substances Site List: two sites are under active cleanup (Lava Cap Mine and Empire Mine State Park) and two sites are backlogged (Pinewood Glen Estates and Davis Mill/Hoge Mine) (DTSC 2007). Lava Cap Mine is more than 3.5 miles from the project site, and Empire Mine State Park is more than 1 mile from the project site. The backlogged sites are both more than 4 miles from the project site. All four sites are listed because of mining-related hazards. There are no leaking underground storage tanks on or near the project site although six leaking underground storage tank cleanups have been completed within 2,500 feet of the project site, as listed on the identified by the State Water Board's GeoTracker website (California State Water Resources Control Board 2016). There are no sites in the project vicinity listed on the EPA Toxic Release Inventory database (U.S. Environmental Protection Agency 2016b).There are no solid waste disposal sites identified by Water Board with waste constituents above hazardous waste levels in the project vicinity (Cal EPA 2016a). There are six active Cease and Desist Orders (CDO) and Cleanup and Abatement Orders (CAO) in Grass Valley and Nevada City, located at local wastewater treatment plants and Empire Mine State Park outside of the project site (Cal EPA 2016b). Many CDOs and CAOs are related to discharges of domestic sewage, food processing wastes, or sediment that do not contain hazardous materials. However, the Water Boards' database does not distinguish between these types of orders. DTSC records do not identify any hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code in the project vicinity (DTSC 2007).

EPA maintains the EnviroMapper for the Envirofacts website, which compiles EPA environmental data and identifies environmental activities related to waste and land. Within approximately 4 miles of the project site, 38 facilities report to EPA about hazardous waste and land (U.S. Environmental Protection Agency 2013a). Examples of these include automotive repair shops, Sierra Community College, Sierra Nevada Memorial Hospital, dry cleaners, and Raley's. Bob's Enterprises (listed for miscellaneous fabricated metal product manufacturing) and the Idaho Maryland Mine property are located on the border of the project site (U.S. Environmental Protection Agency 2013a).

Business Hazardous Waste Collection

Businesses classified as Conditionally Exempt Small Quantity Generators (CESQG) are required to ship their hazardous wastes to the McCourtney Road Transfer Station Hazardous Waste Facility and Recycling Center in Grass Valley for proper disposal. There are no CESQGs within the project site (U.S. Environmental Protection Agency 2013a).

Transportation of Hazardous Materials

The project is located adjacent to State Route (SR) 20/49, which is a major north-south transportation corridor in Nevada County that serves all types of traffic, including vehicles and trucks containing hazardous materials and waste. Hazardous materials can be in liquid, solid, or gas form, and examples can include explosives, flammables, corrosives, radioactive materials, and poisons.

Airport-Related Hazards

The project site is located approximately 1.5 miles from the Nevada County Airport runway. The Nevada County Airport Land Use Compatibility Plan (NCALUCP) designates its influence area as any location within 1.7 miles of the airport runway (Mead & Hunt 2011). Therefore, according to the NCALUCP, the project site is located within Zone D, Traffic Pattern Zone/Urban Overlay Zone.

The project is also located near two private airstrips. Sierra Nevada Memorial Hospital Heliport, owned by Sierra Nevada Memorial Hospital, located at 155 Glasson Way, is approximately 0.2 miles from the project site. Grass Valley Service Center Heliport, owned by Pacific Gas & Electric, is located approximately 2 miles from the project site at the intersection of Highway 49 and McKnight Way.

Asbestos-Related Hazards

The project site contains serpentine rock formations from the mafic and ultramafic era. In the Sierra Nevada foothills area, ultramafic rock and serpentinite are associated with naturally occurring asbestos (NOA) minerals such as chrysotile, actinolite, and tremolite. Materials containing NOA can become a public health hazard if the rock is broken and the asbestos fibers or dust become airborne.

Fire-Related Hazards

Nevada County contains many areas that consist of steep topography, flammable vegetation, and long, dry summers, which result in conditions conducive to wildfires. CAL FIRE maps rank locations as Very High, High, and Moderate for Local Responsibility Areas (areas served by local fire protection districts rather than state or federal agencies). The project site is located in a non-Very High Fire Hazard severity zone, within the local responsibility area (CAL FIRE 2008). Additionally, the proposed project consists of infill in an area that already includes similar commercial land uses served by local fire protection services.

Natural Disaster-Related Hazards

Hazards specifically associated with earthquakes, soil stability, and other geologic conditions are discussed in Chapter 12, Geology, Soils, Seismicity, and Paleontology. Hazards specifically

associated with flooding, mudflow, and other hydrologic conditions are discussed in Chapter 13, Hydrology and Water Quality.

Proximity to Schools

CEQA Guidelines Section 15186 requires consideration of projects within 0.25 miles of a school to ensure that potential health impacts resulting from exposure to hazardous materials, wastes, and substances are evaluated. The project site is located approximately 0.5 miles southeast of William & Marian Ghidotti High School. Nevada Union High School and Nevada Joint Union High School District (to the northwest), and Grass Valley Charter School (to the southwest) are each located approximately 1 mile from the project site.

Emergency Response and Evacuations

As described in the City of Grass Valley 2020 General Plan, the city's primary evacuation routes are the two freeways serving Grass Valley: SR 49 (toward the north and toward the south) and SR 20 (toward the west). Secondary evacuation routes include Brunswick Road (toward the east/southeast), and Idaho-Maryland Road (toward the east, until and unless the road is closed) (City of Grass Valley 1999a). SR 20 and SR 49 are co-located through most of Grass Valley. The project site is adjacent to and southeast of SR 20/49. The project site also connects to Idaho-Maryland Road via Spring Hill Drive to the south, and Idaho-Maryland Road connects to both SR 20/49 to the southwest and Brunswick Road to the southeast of the project site.

15.2 REGULATORY FRAMEWORK

Federal Regulations

Several federal agencies regulate hazardous materials, including the U.S. Environmental Protection Agency, the Occupational Safety and Health Administration (OSHA), the U.S. Department of Energy, and the U.S. Department of Transportation. Applicable federal regulations are contained primarily in Title 40 (Chapter I – U.S. Environmental Protection Agency), Title 29 (Chapter XVII – OSHA), Title 10 (Chapter X – U.S. Department of Energy), and Title 49 (Chapter I – U.S. Department of Transportation) of the Code of Federal Regulations. Title 40, Chapter 1, regulates water and air contamination, pesticide use, toxic substances, emergency planning, and solid and liquid wastes. Title 29, Chapter 17, regulates worker safety and health concerning environmental hazards, and Title 10, Chapter 10, regulates petroleum-based products. Title 49, Chapter 1, regulates the transportation of hazardous materials, and details hazardous material spill/release prevention and response plans. Title 40, 300.400 et seq., entails the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), which dictates how remedial action work plans are conducted. Section 264.18 of CFR Title 40, the Resource Conservation and Recovery Act, pertains to the treatment, storage and disposal of hazardous waste.

Toxic Release Inventory

The Emergency Planning and Community Right-to-Know Act of 1986 and the Pollution Prevention Act of 1990 established a publicly available database called the Toxic Release Inventory (TRI), which has information on toxic chemical releases and other waste management activities. The TRI is updated annually and lists chemical releases by industry groups and federal facilities managed by EPA.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. It established prohibitions and requirements concerning closed and abandoned hazardous waste sites; provided for liability of persons responsible for releases of hazardous waste at these sites; and established a trust fund to provide for cleanup when no responsible party could be identified. Amended in 1986, the act establishes two primary actions: (1) to coordinate short-term removal of hazardous materials; and (2) to coordinate and manage the long-term remedial response actions associated with sites identified on the Environmental Protection Agency's (EPA's) National Priorities List (NPL). The NPL lists known or threatened releases of hazardous substances, pollutants, or contaminants. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) is a national database and management system used by the U.S. Environmental Protection Agency (EPA) to track cleanup activities at CERCLA hazardous waste sites.

State Regulations

Asbestos Regulations

Asbestos exposure in construction work is regulated by Title 8 California Code of Regulations (CCR) Section 1529, which defines permissible exposure limits and work practices. The law requires that removal or disturbance of more than 100 square feet of material containing more than 0.1% asbestos must be performed by a registered asbestos abatement contractor, but associated waste labeling is not required if the material contains 1% or less asbestos. If the asbestos content of materials exceeds 1%, all requirements of the standard become effective. With regards to potential worker exposure, notification, and registration requirements, asbestos-containing construction material (ACCM) is defined by California Division of Occupational Safety and Health (Cal/OSHA) as any construction material containing more than 0.1% asbestos (8 CCR 341.6).

California Environmental Protection Agency (Cal/EPA) Air Resources Board Regulation 93105, *Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations* (ATCM), specifies how to handle disturbance of soil and rock that contain

ultramafic rock, serpentinite or NOA minerals. Per the ATCM, site work must be performed according to protocols established by an Asbestos Dust Mitigation Plan.

California Hazardous Waste Control Law

The California Hazardous Waste Control Law is administered by the California Environmental Protection Agency to regulate hazardous wastes. Although the Hazardous Waste Control Law is generally more stringent than Resource Conservation and Recovery Act, until the U.S. Environmental Protection Agency approves the California program, both the state and federal laws apply in California. The Hazardous Waste Control Law lists 791 chemicals and about 300 common materials that may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal and transportation; and identifies some wastes that cannot be disposed of in landfills.

Title 22 of the California Code of Regulations defines hazardous waste as a waste that exhibits the characteristics that may:

A. cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or

B. pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, disposed of or otherwise managed (22 CCR 662610).

According to Title 22 of the California Code of Regulations, substances having a characteristic of toxicity, ignitability, corrosively, or reactivity are considered hazardous waste. Hazardous wastes are hazardous substances that no longer have a practical use, such as material that has been abandoned, discarded, spilled, or contaminated, or that is being stored prior to proper disposal.

California Code of Regulations Title 27

Sections 22470 through 22490 of CCR Title 27 pertain to classification of mine waste for the purposes of disposal.

California Health and Safety Code

Section 25356.1 of the California HSC requires the regional water quality control board (RWQCB) to prepare or approve removal action plans (as defined in Section 25323.1) for the sites listed pursuant to Section 25356. This section also allows for a potentially responsible party to request DTSC or the RWQBC to prepare or approve a remedial action plan for a site not listed pursuant to Section 25356, if it is determined that a removal or remedial action is required to respond to a release of a hazardous substance. The project applicant has entered into a Voluntary Cleanup Agreement with the DTSC.

Additionally, this section defines the basis for creating remedial plans, the required public involvement, and standards for response actions. Remedial action plans are based upon Section 25350 (e) of the National Oil and Hazardous Substances Pollution Contingency Plan and the following six factors, to the extent that they do not require a less stringent level of cleanup than the federal regulations:

- Health and safety risks posed by the conditions at the site;
- The effect of contamination or pollution levels upon present, future and probable beneficial uses of contaminated, polluted or threatened resources;
- The effect of alternative remedial action measures on the reasonable availability of groundwater resources for present, future, and probable beneficial uses;
- Site-specific characteristics, including the potential for off-site migration of hazardous substances, the surface or subsurface soil, and the hydrogeologic conditions, as well as preexisting background contamination levels;
- Cost-effectiveness of alternative remedial action measures; and
- The potential environmental impacts of alternative remedial action measures, including but not limited to, land disposal of the untreated hazardous substances as opposed to treatment of the hazardous substances to remove or reduce its volume, toxicity, or mobility prior to disposal.

Proposed remedial actions in the work plan must be based upon, and be no less stringent than the following six regulations:

- Requirements established under federal regulations pursuant to Subpart E of the NCP (40 CFR 300.400 et seq.), as amended, which pertains to remedial action and selection of remedial alternatives; Regulations established pursuant to Division 7 (commencing with Section 13000) of the California Water Code, which pertains to state and regional water quality control; Applicable water quality control plans adopted pursuant to Section 13170 of the California Water Code;
- Article 3 (commencing with Section 13240) of Chapter 4 of Division 7 of the California Water Code, which pertains to water quality control plans and waste discharge requirements;
- Applicable state policies for water quality control adopted pursuant to Article 3 (commencing with Section 13140) of Chapter 3 of Division 7 of the California Water Code, to the extent that those policies are consistent with the federal regulations; and

Section 25356.1 of the HSC outlines public participation requirements for the RAW. Requirements include the preparation of a community profile report to determine public interest in the remedial

action, notice of the RAW in a newspaper of general circulation, provision of a minimum 30-day public comment period, and preparation of a responsiveness summary

Applicable provisions of the California HSC, to the extent those provisions are consistent with the federal regulations; and the PEA risk assessment findings. Section 25505 of the HSC requires businesses using hazardous materials to develop and submit a business plan describing the facility, inventory, a site map, emergency response and evacuation plans, and training programs, to the local Certified Unified Program Agency (CUPA), which, for the proposed project, is the Hazardous Materials Division of Nevada County Department of Environmental Health.

California Human Health Screening Levels

Developed by the California Environmental Protection Agency, pursuant to Health and Safety Code Section 57008, California Human Health Screening Levels (CHHSLs) are concentrations of chemicals in soil or soil gas below thresholds of concern for risk to human health: an excess lifetime cancer risk of one-in-a-million and a hazard quotient of 1 for non-cancer health effects.

Cortese List

The Hazardous Wastes and Substances Site (Cortese) List, maintained by Cal-EPA, is a list of data resources used by state and local agencies and developers to provide information about the location of hazardous materials release sites, per Government Code Section 65962.5. The DTSC, State Water Board, and California Department of Resources Recycling and Recovery all contribute data related to hazardous waste and substances sites, leaking underground storage tanks, solid waste disposal sites with waste constituents above hazardous waste levels, active Cease and Desist Orders and Cleanup and Abatement Orders, as well as hazardous waste facilities subject to corrective action.

National Pollutant Discharge Elimination System

Authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) Permit Program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. The NPDES Program is a federal program which has been delegated to the State of California for implementation through the State Water Resources Control Board (State Water Board) and the nine Regional Water Quality Control Boards (Regional Water Boards), collectively Water Boards (see the following State Water Resources Control Board section).

Stormwater Pollution Prevention Plan

Construction General Permits require the development of a Stormwater Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Any project that disturbs one or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Discharges of Stormwater Associated with Construction Activity Construction General Permit Order 2009-0009-DWQ. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

State Water Resources Control Board

The State Water Resources Control Board (SWRCB) protects water quality in California by setting statewide policy. The SWRCB supports the nine RWQCBs, which, within their areas of jurisdiction, protect surface and groundwater from pollutants discharged or threatened to be discharged to the waters of the state. For Nevada County, the Central Valley RWQCB maintains jurisdiction within the subject basin. This protection is carried out by the RWQCB through the issuance and enforcement of National Pollutant Discharge Elimination System permits, called Waste Discharge Requirements, regulation of leaking USTs and contaminated properties through the Leaking Underground Storage Tank (LUST) and Spills, Leaks, Investigation, and Cleanup (SLIC) programs, respectively. The SWRCB also regulates the handling, storage, and disposal of hazardous substances on construction projects. Permits and/or other action by the SWRCB may be required if contamination of water or soils occurs during construction of the proposed project.

Local Regulations

City of Grass Valley 2020 General Plan

The General Plan is a comprehensive plan and policy document regarding growth and development in the City of Grass Valley and the surrounding unincorporated area. The Grass Valley 2020 General Plan Safety (S)) Element identifies safety-related issues designed to reduce, eliminate, and avoid risks to persons and property from these issues. The Circulation (C) Element is intended to (1) promote the safe, efficient and reliable movement of the people and goods; (2) facilitate a level of transition from the automobile to other modes of transportation; and (3) provide an adequate level of transportation

service for all persons traveling in and through Grass Valley. The following goals (G), objectives (O), policies (P) and implementation actions (I) are relevant to the proposed project:

1-SG: Reduce the potential risk of death, injury, property damage, and economic and social dislocation resulting from hazards.

5-SO: Reduction of risk from exposure to hazardous materials, including contaminated sites

24-CP: Coordinate circulation and development plans with public safety agencies, fire departments/districts and emergency service providers.

4-SP: Based on location or probable need, require development plans in mined areas to include in depth assessments of potential safety, including mining-related excavations, and health hazards and accompanying mitigation measures.

7-SP: Identify, maintain, and mark evacuation routes for use in case of disasters or emergencies.

8-SP: Assure public awareness of fire-safety measures, including those addressing property maintenance and evacuation.

9-SP: Develop and implement fire-safe community design and landscaping standards, construction codes, and property maintenance regulations.

Local Hazard Mitigation Plan for Nevada County 2011-2016

The Nevada County Operational Area Emergency Services Council prepared this Local Hazard Mitigation Plan on behalf of the County, its incorporated cities and towns and participating districts. The planning process examined the recorded history of losses resulting from natural and selected human-caused hazards and analyzed the future risks to the county by these hazards. The plan names several mitigation goals and objectives that are based on the results of the risk assessment, and contains specific recommendations, action items and projects that can mitigate future disaster losses.

Nevada County Airport Land Use Compatibility Plan

The NCALUC (Mead & Hunt 2011) sets compatibility criteria applicable to local agencies in their preparation or amendment of land use plans and ordinances and to land owners in their design of new development. The influence area extends 1.5 miles from the airport's runway. Within Zone D, the Traffic Pattern Zone/Urban Overlay Zone, the plan requires a maximum residential density of 20 dwelling units/acre, but no intensities limit for other uses. Prohibited uses include highly noise-sensitive uses and hazards to flight. NCALUC airspace review is required for objects more than 3,207 feet above mean sea level (MSL). NCALUC review may be warranted for proposals for new development (including buildings, antennas, and other structures) having a height of more

than 100 feet within Compatibility Zone D. Land use development that may cause the attraction of birds to increase is also prohibited.

15.3 IMPACTS

Methods of Analysis

The baseline for hazards and hazardous materials includes the hazards and hazardous materials that currently exist in the area and which are identified in sources cited in the Environmental Setting. This section provides a qualitative discussion of the potential risks involving hazards and hazardous materials as a result of the proposed project.

Significance Criteria

Potential significant impacts associated with hazardous waste/materials impacts have been evaluated using the following criteria. Would the project:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?
- 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?
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within 0.25 miles of an existing or proposed school?
- Be located on a site which is included on a list of hazardous materials 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?
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?
- Create or expose residents to potential health hazards?

Project Impacts

Impact 15-1: Would the project create a significant hazard to the public or environment through routine transport, use, or disposal of hazardous materials?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation Measure 15a	Mitigation Measure 15a
Significance after mitigation:	Less than significant	Less than significant

Alternative A

As discussed in Section 15.1, Environmental Setting, the project site contains hazardous materials as a result of the past mining activities. These conditions must be remediated to make the site safe for human use. Remediation would involve the use, transport, and disposal of hazardous materials. Thus, the project would have a **potentially significant** impact associated with potential hazards associated with these activities. As discussed in this impact, implementation of the RAW would ensure that the remediation activities are carried out in a manner that does not create additional hazards. Mitigation Measure 15a specifies that implementation of the RAW must be completed to the satisfaction of the DTSC prior to proceeding with development of the proposed project. With implementation of the RAW as required by Mitigation Measure 15a, the impact would be reduced to a **less-than-significant** level.

Remediation of the project site, as well as construction and operation of residential and commercial uses could result in the transport, use, or disposal of hazardous materials. Remediation and construction would require use of heavy construction equipment (e.g., excavators, backhoes, grading machines, asphalt machines), the operation and maintenance of which would involve the use and handling of hazardous materials, including diesel fuel, gasoline, lubricants, and solvents. These hazardous materials would be used and stored within the area designated for the remediation and construction sites. Diesel fuel would be used to power the equipment and would be present in the fuel tanks of the individual pieces of equipment and potentially in larger quantity storage tanks used to refuel the equipment. Additionally, during remediation and construction of residential or commercial buildings, small quantities of lubricants and solvents would be stored in the support area for maintenance of construction equipment. The quantities of hazardous materials could exceed regulatory thresholds and thus require transport, handling, storage and disposal in accordance with federal, state, or local regulations, to minimize the potential for release of hazardous materials into the environment. Therefore, the use and presence is not anticipated to cause a significant hazard to the public or environment.

Alternative A would include cleanup of the former mine site. Prior to construction of the proposed project, an estimated 64,000 cubic yards of mine waste rock and processed tailings would need to be removed from the project site. As described in Section 15.1, Environmental Setting, the

contaminated soils, rock, and tailings contain constituents of potential concern (COPC) regarding human health, such as arsenic, antimony, vanadium, and other metals. The RAW describes two methods by which humans can be exposed to high levels of metals: contact with skin and incidental ingestion of surface soil, and inhalation of airborne particulates resulting from wind erosion of surface soil. The RAW describes procedures for conducting soil excavation, off-site disposal, and on-site placement at the project site, to make the project site safe for human use. Excavation and disposal, as well as burial of the mine waste, effectively reduces human health risk by eliminating the potential for human exposure (incidental ingestion, inhalation of airborne particulates, and dermal contact with the impacted soil). The RAW also includes a Site Safety Plan, which all parties involved in the remediation process would follow (Appendix J-3A).

Remediation would take place before construction of the proposed project. The RAW identified two separate strategies for remediation of AOC 1 and AOC 2. The mine waste within AOC 1 would be excavated and removed from the site while the waste in AOC 2 would be consolidated and buried beneath the proposed commercial development, as discussed further in the following paragraphs. Any mine waste and soil that would be consolidated and buried on site, or which would remain on site without consolidation and burial, must meet acceptable constituent concentration percentages, as identified in the RAW. Any remaining materials that exceed those percentages would be removed from the site (Appendix J-3A).

The RAW recommends excavation and off-site disposal for AOC 1. The roughly 1,700 cubic yards of mine waste and affected soil would be excavated and transported to an appropriate Class I or Class II solid waste disposal facility. Class II (non-hazardous) waste would be transported to and disposed at Norcal Waste Systems' Ostrom Road Landfill Inc., in Wheatland. Class I waste would be transported to and disposed at the Chem Waste Management facility in Kettleman Hills. Soil would be excavated via mechanical excavation using rubber-tired or track-mounted backhoe excavators and loaders. During excavation, stockpiling and loading, workers would dampen soil as necessary, using water trucks or hoses, to reduce dust generation. Before removing the affected soil, vegetation removal would also be conducted in the areas to be excavated using hand-held mechanical equipment to minimize disturbance of soil prior to excavation, before being removed from the work area. The soil would then be stockpiled onto and covered with plastic sheeting, adjacent to the excavation. The covered soil would be loaded into trucks and transported to an off-site landfill for disposal. Based on preliminary volume estimates, approximately 150 truckloads would be used for off-haul, and another 150 truckloads would be used for import of clean fill. The trucks used for off-haul would have closed-tarp bins or covered with tarps. They would exit the site via Spring Hill Drive (a public roadway with single lanes in each direction) to the south and Idaho Maryland Road (a public roadway with single lanes in each direction) to the west. Trucks would enter SR 20/49 southbound from Idaho-Maryland Road, approximately 1 mile southwest of the site. Transportation and disposal of waste from the site is to be conducted in accordance with applicable local, state, and federal regulations (Appendix J-3A).

The RAW recommends excavation and on-site placement (or capping) for AOC 2. An estimated 62,300 cubic yards of mine waste and affected soil would be excavated, transported within the site, and capped in an area that is not subject to surface water infiltration or groundwater seepage, such as the foundations of a building, or a parking lot, as shown in the conceptual plan provided on Figure 15-4, On-Site Containment. Similar to the excavation for AOC 1, excavation methods would include mechanical excavation using rubber-tired or track-mounted backhoe excavators and loaders, and soil would be damped to reduce dust generation. All transportation of mine waste and affected soil would occur within the site boundaries, and may include minor clearing and grading. The RAW, Appendix J-3A, includes a conceptual placement plan and general grading recommendations. Prior to implementation of the RAW, DTSC would review and approve site development plans showing the final development layout and waste placement details. In the event that any ground-disturbing activities would occur on the project site prior to the site remediation activities, DTSC must review the proposed ground-disturbing activities and the project proponent/construction contractor would mark remediation areas on the site so the areas may be avoided. After excavation and on-site placement, soil samples would be tested. If soil sample results meet the proposed remedial goals, the former location of AOC 2 would then be suitable for unrestricted land use, such as construction and implementation of the proposed project. Development of the proposed project would coincide with site remediation. Once construction of the proposed commercial building and paved parking area over the soil repository area is complete, in accordance with the project development plans, DTSC would be notified that the project is complete. The structures and pavement are intended to provide access restriction; however, if structures and pavement are not immediately constructed upon completion of site remediation, the waste placement area shall be fenced and posted until the structures and pavement are constructed (Appendix J-3A).

The project proposes to construct approximately 178,960 square feet of commercial building space, consisting of four major shops, six smaller shops, and three drive-through restaurants. Businesses such as these may be classified as small or large quantity generators of hazardous waste depending on the nature of their businesses. The operation of businesses that could be developed on lands designated for commercial use could result in the transport, use, or disposal of hazardous waste within the project area. However, there is a low potential for these materials to cause a significant hazard to the public or environment because all new businesses would be required to comply with the regulations, standards, requirements, and guidelines, established by federal and state law and overseen by agencies as previously described in Section 15.2, Regulatory Framework. Additionally, the California Safety Code requires all businesses that handle moderate amounts of hazardous materials to submit business plans and emergency management plans. Therefore the proposed project would not be expected to cause a significant hazard to the public or environment and the impact would remain **less than significant**.

The proposed project would also construct 90 multiple-family dwelling units. Hazardous wastes generated by residential uses are referred to as household hazardous waste. Households commonly

discard items such as paints, stains, oven cleaner, motor oil, and pesticides, as well as batteries, thermostats, lamps, televisions, and computer monitors that contain hazardous constituents. The county collected 1,023,398 tons of household hazardous waste through its various collection programs in 2014, or 10.42 pounds of hazardous household waste per person (California Department of Resources Recycling and Recovery 2016). Based on this average rate of hazardous household waste generation, buildout of residential development under the proposed project would allow for approximately 1,917.28 pounds of household hazardous waste each year. Household hazardous waste is exempt from reporting. Nevada County directs residents to the McCourtney Road Transfer Station in Grass Valley to dispose of household hazardous waste (Nevada County 2016). Therefore, it is anticipated that the generation of household hazardous waste or the disposal of it as a result of the residential development would result in a **less-than-significant** hazard to the public or environment.

Alternative A would place residences near the SR 20/49 corridor and possible hazardous materials being transported along the corridor. However, residences are already located in the vicinity of the project site and SR 20/49. The project would not increase the likelihood of hazardous spills or accidents on the highway. Nor would the project affect the type or amount of hazardous materials or the frequency of hazardous materials shipping. Therefore, this impact would be **less than significant**.

The DTSC approved the RAW and filed a Notice of Exemption from CEQA for the cleanup project (Appendix J-3B). Remediation, as well as construction and operation of the proposed project, would include oversight by the appropriate federal, state, and local agencies and would comply with applicable regulations regarding hazardous materials. Therefore, there is a low likelihood that hazardous materials would create a significant hazard to the public or environment through the routine transport, use, or disposal of materials during remediation, construction and operation of Alternative A. With implementation of Mitigation Measure 15a, this impact would be **less than significant**.

Alternative B

Alternative B would be constructed within the same project site and involve the same area of disturbance as Alternative A. It would require the same remediation outlined in the RAW and would result in the same low likelihood of a significant hazard to the public or environment through the routine transport, use, or disposal of materials during remediation and construction. Alternative B proposes to develop less commercial space, more multifamily dwelling units, and 8,500 square feet of office uses. The use of hazardous materials in a typical office use would be similar to the use of hazardous materials in commercial and residential areas. Thus Alternative B would have the same low likelihood of a significant hazard to the public or environment through the routine transport, use, or disposal of materials during project operation as Alternative A. With implementation of Mitigation Measure 15a, Alternative B would have a **less-than-significant** impact.

Impact 15-2: Would the project create a significant hazard to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation Measure 15a	Mitigation Measure 15a
Significance after mitigation:	Less than significant	Less than significant

Alternative A

Remediation of the project site and development of Alternative A, as previously described, would remove risks and improve safety related to human health and the environment, compared to existing conditions. However, during remediation and construction, activities such as soil excavation and stockpiling, rock excavation, fill slope grading, paving, and other disruption of the existing soil and geology on the project site would occur. Construction equipment that would be used during remediation or to build the proposed project has the potential to accidentally release oils, greases, solvents, and other finishing materials. Potential spills or upset of such materials would have the potential to affect surrounding land uses. However, because the volume in any single piece of construction equipment is generally less than 50 gallons, and fuel trucks are limited to 10,000 gallons or less, the amount of hazardous material released during a construction-related spill is typically small. While spills of hazardous materials are not uncommon during construction, the enforcement of construction and demolition standards, such as a stormwater pollution prevention plan (SWPPP) and BMPs by appropriate local and state agencies (i.e., fire departments) would minimize the potential for an accidental release of petroleum products and/or hazardous materials. Federal, state, and local laws would be enforced to reduce the effects of potential hazardous materials spills during construction.

Mechanical soil disturbance activities associated with construction would disrupt the existing soil and geology on the project site and have the potential to disrupt NOA, which often occurs in the Sierra Nevada foothills Area in ultramafic rock and serpentinite rock. If NOA is found during remediation or construction of the proposed project, NOA materials would be handled in accordance with Cal/EPA Air Resources Board Regulation 93105, Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations. This regulation requires site work be performed according to protocols established by an Asbestos Dust Mitigation Plan, which is included in the RAW (Appendix J-3A). The Asbestos Dust Mitigation Plan outlines engineering controls that must be used on site to reduce the risk of release of metals and NOA fibers into the environment during site clearing, excavation, grading, underground utility work, transportation, and disposal activities. Specifically, the measures that would be taken to ensure that asbestos-containing soil does not become airborne and thus create a health hazard include:

- Track-out prevention, including using a gravel pad or metal screen and spraying down vehicles that have entered the construction zone to prevent asbestos-containing soil from being transported off site on construction vehicles.
- Sufficiently wetting soil known to contain asbestos or tailings, especially during earthmoving activities, and
- Suspending all mechanical soil disturbance activities during high winds.

Physical hazards may exist due to the abandoned mine excavations identified at the site, as well as other mine excavations that may be present on and adjacent to the site. These may present hazards such as entrapment, collapse, or hazardous confined space conditions, to workers during construction and remediation. Such areas may not be suitable to support structural improvements. The RAW, Appendix J-3A, specifies methods to close the excavations and address the possibilities of physical hazards. Temporary measures are appropriate to reduce the existing physical hazards, but final physical closure of the excavations would be performed in accordance with recommendations from a qualified geotechnical engineer and with the approval of the local building department (Appendix J-3A).

With implementation of the RAW as required by Mitigation Measure 15a, oversight by the appropriate federal, state, and local agencies, including the DTSC which approved the PEA and the RAW (Appendix J-3B), and compliance with applicable regulations regarding hazardous materials, there would be limited potential for a reasonably foreseeable upset or accident during remediation, construction, or operation. Therefore, it is not anticipated that a significant hazard to the public or the environment would occur. This impact would be **less than significant**.

Alternative B

Alternative B would occur on the same project site, involve a similar area of disturbance, and would be subject to all the same federal, state, and local regulations and oversight as Alternative A. Primary oversight during remediation activities would come from DTSC. With implementation of the RAW as required by Mitigation Measure 15a there would be limited potential for a reasonably foreseeable upset or accident during remediation, construction, or operation, and Alternative B would it is not anticipated that a significant hazard to the public or the environment would occur. Therefore, Alternative B will have a **less-than-significant** impact.

Impact 15-3: Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within 0.25 miles of an existing or proposed school?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	No impact	No impact
Mitigation measures:	None required	None required
Significance after mitigation:	No impact	No impact

Alternative A and Alternative B

All existing nearby schools are more than 0.25 miles from the project site. William & Marian Ghidotti High School is approximately 0.5 miles northwest of the project site, separated from the project site by Highway 49. Nevada Union High School and Nevada Joint Union High School District (to the northwest), and Grass Valley Charter School (to the southwest) are all located approximately 1 mile from the project site. Both Alternative A and B would not include any operations that would emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 miles of an existing or proposed school. There would be no impact.

Impact 15-4: Would the project be located on a site which is included on a list of hazardous materials sites, and as a result, would create a significant hazard to the public or environment?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation Measure 15a	Mitigation Measure 15a
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

The project site is identified as an active voluntary cleanup site on the EnviroStor website (DTSC 2018) under the site name Spring Hill Mine. Therefore development of the site has a potential to create a hazard to the public or the environment, and this impact is **potentially significant.** As documented in Section 15.1, the project site is not designated as a hazardous materials site on any other Cortese List databases, and is not included on any state or federal list of potentially hazardous materials. DTSC adopted a CEQA Notice of Exemption for implementation of the RAW (Appendix J-3B). Completion of the remediation activities described in the RAW, as required by Mitigation Measure 15a and as previously summarized in Impact 15-1, would reduce the potential for development of the project site to result in hazards to the public and environment. Implementation of the RAW is a component of the proposed project under both Alternative A and Alternative B, and the RAW has already been approved by DTSC as sufficient to ensure that the hazardous materials existing within the project site would be appropriately removed or contained within the site to allow for unrestricted land use. Thus with implementation of the RAW as required

by Mitigation Measure 15a, there would be no potential for the public that may reside within or visit the project site to be exposed to hazardous materials and this impact would be reduced to a **less-than-significant** level for both Alternative A and Alternative B.

Impact 15-5: Would the project be 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, and as a result, would result in a safety hazard for people residing or working in the project area?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

The only public airport near the project site is the Nevada County Airport, which is located 1.45 miles from project site. The project site is within the 1.5-mile influence of the NCALUC. The site falls under Zone D, Traffic Pattern Zone and Urban Overlay Zone, which may require NCALUC review for proposals for new development (including buildings, antennas, and other structures) having a height of more than 100 feet within Compatibility Zone D (Mead & Hunt 2011). Land use development that may create attractions for birds is also prohibited.

The maximum proposed height of buildings under Alternative A and Alternative B is 40 feet. Neither alternative would include any features that would attract birds, such as ponds, pools, or wetlands. There may be some trash left on sidewalks or in the parking lot from patrons of the proposed restaurant uses within the site that could attract birds, however these would be typical of urban uses and would not be expected to attract large flocks of birds flying at elevations that could interfere with aircraft. Therefore, both Alternative A and Alternative B would result in no impact related to safety hazards for people residing or working in the project area.

Impact 15-6: Would the project be located within the vicinity of a private airstrip, and would result in a safety hazard for people residing or working in the project area?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

The nearest private airstrip to the project site is a helipad at the Sierra Nevada Memorial Hospital approximately 0.2 miles from the project site, separated from the project site by SR 20/49. The

helipad is for use by emergency helicopters only. The proposed project would not introduce land uses that are substantially different from those that currently exist near the project site and the Sierra Nevada Memorial Hospital helipad. Grass Valley Service Center Heliport, owned by Pacific Gas & Electric, is located approximately 2 miles from the project site, and would not be affected by the proposed project.

Construction and development of either Alternative A or Alternative B would have a less-than-significant impact related to interfering with private airstrips and creating a safety hazard for people residing or working in the project area.

Impact 15-7: Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A

As described in Section 15.1, the City of Grass Valley 2020 General Plan identifies SRs 20 and 49 as the city's primary evacuation routes and Brunswick Road, and Idaho-Maryland Road as secondary evacuation routes (City of Grass Valley 1999a). Under Alternative A, the proposed project would not require any modifications to these roadways other than installation of traffic signals at several locations as discussed in Chapter 8, Transportation.

Construction of the proposed project could result in increased construction-related vehicles on roads nearby and adjacent to the proposed site. This activity would be limited to the construction period and would affect only the streets and intersections adjacent to the project site, and as such, would be unlikely to interfere with emergency response vehicles (e.g., fire, police, or ambulance). Because of the project's proximity to the identified emergency evacuation routes, construction vehicles may use roads that are used as emergency access or evacuation. As part of preparation of the RAW, Holdrege & Kull contacted the City of Grass Valley and Caltrans District 3; neither agency found that the traffic associated with implementation of the RAW would interfere with routine roadway operations or emergency response (Appendix J-3A).

Operation of the various businesses or residences developed as part of the proposed project would introduce additional residents and attract other drivers to the project area, thereby increasing traffic on nearby roads, some of which serve as emergency evacuation routes. This has the potential to interfere with the response times of emergency vehicles. However, the project would adhere to appropriate site design for safety and evacuation, such as Safety Implementation Action 4-SI and Circulation Policy 24-CP in the City of Grass Valley 2020

General Plan. For information regarding project-related traffic impacts to nearby roads, such as SR 20/49, see Chapter 8, Transportation. For information regarding emergency response times, see Chapter 14, Public Services and Utilities.

Construction and operation of Alternative A would increase background traffic levels in the project region but would not introduce substantial roadway congestion or modify the City's identified evacuation routes. Therefore Alternative A would have a **less-than-significant** impact associated with impairing implementation of or physically interfering with the adopted emergency evacuation plan.

Alternative B

Alternative B would occur on the same project site and would maintain the same primary and secondary evacuation routes; the alternative would not include construction associated with the identified emergency evacuation roadways. Like Alternative A, Alternative B has the potential to affect emergency vehicle response times, although Alternative B would generate less peak hour traffic than Alternative A. However, both alternatives would adhere to appropriate site design for safety and evacuation, such as Safety Implementation Action 4-SI and Circulation Policy 24-CP in the City of Grass Valley 2020 General Plan. Therefore, Alternative B would have a less-than-significant impact.

Impact 15-8: Would the project expose people or structures to a significant risk of loss, injury, or death involving wildland fires?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	No impact	No impact
Mitigation measures:	None required	None required
Significance after mitigation:	No impact	No impact

Alternative A and Alternative B

The project site is located in an urban area, in a non-Very High Fire Hazard severity zone and local responsibility area (CAL FIRE 2008). Additionally, the proposed project consists of infill development in an area that already includes similar commercial and residential land uses served by local fire protection services. Several major roads surround the project site, such as SR 20/49, Idaho-Maryland Road, and Brunswick Road. These roads separate the developed project vicinity from the less-developed area to the east of the city. Therefore, both Alternative A and Alternative B would have **no impact** associated with exposing people or structures to a significant risk of loss, injury, or death involving wildland fires.

Impact 15-9: Would the project create or expose residents to potential health hazards?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Potentially significant	Potentially significant
Mitigation measures:	Mitigation Measure 15a	Mitigation Measure 15a
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B

The project site contains naturally occurring asbestos and was once used as a mining site. Earth-moving activities within the project site could release these materials into the air, which could expose people within the project site and in the project vicinity to health hazards. In addition, if the hazardous materials that are present on the site as a result of the past mining activities are not removed or capped, development of commercial, office, and residential uses within the site could expose people within the site to health hazards from exposure to these hazardous materials. Thus the project, under either Alternative A or Alternative B, would have a **potentially significant** impact associated with potential exposure of people to health hazards. As discussed in Impact 15-1 and 15-2, both alternatives would require the implementation of the RAW to remediate the known potential health hazards on the site, including preventing the release of naturally occurring asbestos through implementation of the Asbestos Dust Mitigation Plan included in the RAW. Mitigation Measure 15a specifies that implementation of the RAW must be completed to the satisfaction of the California Department of Toxic Substances Control prior to proceeding with development of the proposed project.

The proposed land uses under both Alternative A and Alternative B would be expected to use common hazardous materials, such as cleaning and property maintenance products, which are not expected to create substantial health hazards.

With implementation of the RAW as required by Mitigation Measure 15a, and compliance with all applicable federal, state, and local laws and regulations throughout construction and operation of the project, both Alternative A and Alternative B would have a **less-than-significant** impact due to the low likelihood of a hazardous impact related to public health.

Impact 15-10: Would the project contribute to a significant impact regarding hazards or hazardous materials in the cumulative condition?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	No impact	No impact
Mitigation measures:	None required	None required
Significance after mitigation:	No impact	No impact

Alternative A and Alternative B

The geographic scope for consideration of cumulative impacts related to hazards and hazardous materials is the Grass Valley area. Alternative A and Alternative B would occur on the same project site with a similar area of disturbance and under the same cumulative scenario. As discussed further below, ~~P~~potential hazardous materials impacts related to site-specific conditions is generally not regional in nature and impacts from one project typically do not combine with impacts from other projects in the area to create a cumulative impact. Thus, there would be no cumulative impact to which either alternative could contribute. Compliance with all applicable federal, state, and local regulations related to hazards and hazardous materials on a project-by-project basis would be required for all projects within the Grass Valley area and would ensure that site-specific impacts are appropriately addressed and cannot combine with site-specific impacts from other project sites.

For any projects in the Grass Valley area that would entail development of a previously developed site, the potential exists for release of hazardous substances during demolition and construction at those sites. For individuals not involved in construction activities, the greatest potential source of exposure to contaminants would be airborne emissions, primarily through dust either from soil remediation activities or from soil-disturbing activities during construction where previously unidentified contamination may exist. However, concentrations of airborne emissions, including emissions from construction equipment exhaust decrease, dust, and asbestos, decrease quickly with distance from the project site, and there are no reasonably foreseeable projects in the near term or cumulative condition that would involve construction on sites that are proximate to the Dorsey Marketplace project site. Thus there is no potential for airborne emissions from construction at the project site to combine with airborne emissions from other project construction and there is **no impact** in the cumulative scenario associated with airborne emissions during construction. Further, the dust and asbestos emission controls that would be implemented at the project site under the air quality mitigation measures and Asbestos Dust Mitigation Plan included in the RAW would ensure that airborne emissions from the project site are reduced to levels that do not cause significant adverse health effects. (Other potential pathways, such as direct contact with contaminated soils or groundwater, would not pose as great a risk to the public because such exposure scenarios are site specific and would typically be confined to the construction zones.)

Use, Storage, and Transport of Hazardous Materials during Construction

During the construction process, hazardous materials spills or accidents would typically be site-specific and would not combine with other uses to create a cumulative effect. Associated health and safety risks generally would be limited to those individuals using the materials or to persons in the immediate vicinity of the materials. Therefore there is **no impact** in the cumulative scenario associated with use, storage, and transport of hazardous materials during construction.

Use, Storage, and Transport of Hazardous Materials during Operation

The implementation of either Alternative would not introduce any new industrial land uses to the project site. During project operation, the use, storage, and transport of hazardous materials would be limited to materials such as paints, solvents, cleaning supplies, pool chemicals, pesticides, herbicides, and gas products. Both Alternatives, in conjunction with other existing, planned, and probable future projects within the City of Grass Valley, would result in an increase in the amount of hazardous materials used and stored within and transported through the City. New projects would involve similar requirements for use, storage, and transport of hazardous materials as the proposed project. The quantities of hazardous materials that would be present during occupancy of these residential and retail land uses under Alternative A and the residential, office, retail uses under Alternative B are expected to be minimal and would consist of typical cleaning and property maintenance products. Compliance with applicable hazardous materials management laws and regulations adopted at the federal, state, and local level would ensure cumulative impacts related to hazardous materials use remain less than significant; both Alternative A and Alternative B would have **no impact** associated with contributing to a significant cumulative impact.

15.4 MITIGATION MEASURES

Mitigation Measure 15a: The project applicant shall implement the Removal Action Workplan (RAW) as approved by the California Department of Toxic Substances Control prior to construction of the proposed project. This shall include excavation and off-site disposal for the waste in Area of Concern (AOC) 1, and on-site consolidation and burial of mine waste rock and tailings beneath the proposed commercial development in AOC 2. In AOC 1, vegetation removal must be conducted in the areas to be excavated using hand-held mechanical equipment to minimize disturbance of soil prior to excavation. In AOC 2, prior to implementation of the RAW, DTSC must review and approve site development plans showing the final development layout and waste placement details. In the event that any ground-disturbing activities would occur on the project site

prior to the site remediation activities, DTSC must review the proposed ground-disturbing activities and the project proponent/construction contractor would mark remediation areas on the site so the areas may be avoided. After excavation and on-site placement, soil samples must be tested and submitted to DTSC to verify that soil conditions meet the remedial goals defined in the RAW. Throughout all activities conducted in implementation of the RAW, contractors must adhere to each component of the RAW, including, but not limited to the Site Safety Plan and the Asbestos Dust Mitigation Plan.

15.5 REFERENCES CITED

Cal EPA (California Environmental Protection Agency). 2016a. *Sites Identified With Waste Constituents Above Hazardous Waste Levels Outside The Waste Management Unit.* Available at: http://www.calepa.ca.gov/sitecleanup/corteselist/CurrentList.pdf. Accessed: August 8, 2016.

Cal EPA (California Environmental Protection Agency). 2016b. *CDOCAO List*. Available at: http://www.calepa.ca.gov/sitecleanup/corteselist/CDOCAOList.xlsx. Accessed: August 8, 2016.

CAL FIRE (California Department of Forestry and Fire Protection). 2008. *Local Responsibility Area.* Available at: http://www.fire.ca.gov/fire_prevention/fhsz_maps_nevada. Accessed: August 4, 2016.

California Department of Resources Recycling and Recovery. 2016. *Household Waste County Summary Data*. Available at: http://www.calrecycle.ca.gov/HomeHazWaste/Reporting/Form303/CountySumm.htm. Accessed: August 17, 2016.

California State Water Resources Control Board. 2016. *Geotracker.* Available at: https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=dorsey+drive%252#. Accessed: August 18, 2016.

City of Grass Valley. 1999a. *City of Grass Valley 2020 General Plan*. Adopted November 1999.

City of Grass Valley. 1999b. *City of Grass Valley General Plan Update Environmental Impact Report*. Prepared for the City of Grass Valley by Quad Knopf. August 1999.

DTSC (California Department of Toxic Substances Control). 2007. *Hazardous Waste And Substances Site List.* Available at: http://www.envirostor.dtsc.ca.gov/public/

search.asp?PAGE=6&CMD=search&ocieerp=False&business_name=&main_street_number=&main_street_name=&city=&zip=&county=&branch=&status=ACT%2CBKLG%2CCOM&site_type=CSITES%2COPEN%2CFUDS%2CCLOSE&cleanup_type=&npl=&funding=&reporttype=CORTESE&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST&federal_superfund=&state_response=&voluntary_cleanup=&school_cleanup=&operating=&post_closure=&non_operating=&corrective_action=&tiered_permit=&evaluation=&spec_prog=&national_priority_list=&senate=&congress=&assembly=&critical_pol=&business_type=&case_type=&display_results=&pub=&hwmp=False&permitted=&pc_permitted=&inspections=&complaints=&ORDERBY=county&next=Next+50. Accessed: August 18, 2016.

DTSC (California Department of Toxic Substances Control). 2018. EnviroStor report for Spring Hill Mine (600000663). Available at: http://www.envirostor.dtsc.ca.gov/public/profile_report.asp?global_id=60000663. Accessed: September 7, 2018.

Mead & Hunt. 2011. *Nevada County Airport Land Use Compatibility Plan*. Available at: http://www.nctc.ca.gov/Reports/Aviation-Reports/index.html. Accessed: August 4, 2016.

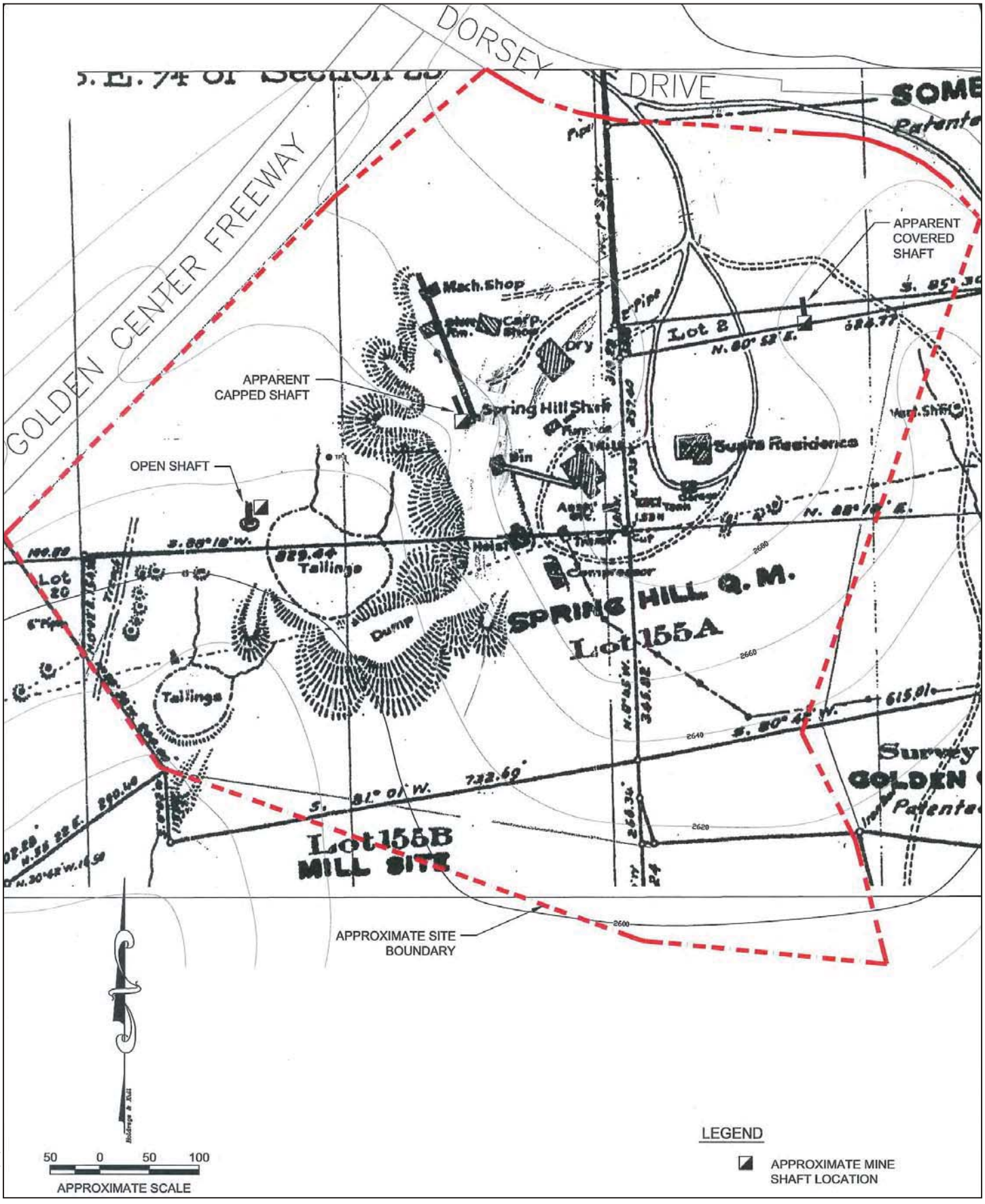
Nevada County. 2016. *Nevada County Public Works Recycling Facilities*. Available at: http://nevcounty.maps.arcgis.com/apps/webappviewer/index.html?id=d17cb4b387e24995be550c0dd89e073b. Accessed: August 17, 2016.

Quad Knopf. 1998. *Grass Valley General Plan Background Report.* November 1998.

U.S. Environmental Protection Agency. 2013a. *Envirofacts*. Available at: https://oaspub.epa.gov/enviro/enviroFACTS.quickstart?minx=-121.091480&miny=39.2032. Accessed: August 18, 2016.

U.S. Environmental Protection Agency. 2016a. *CERCLIS.* Available at: https://iaspub.epa.gov/enviro/efsystemquery.cerclis?fac_search=primary_name&fac_value=. Accessed: August 8, 2016.

U.S. Environmental Protection Agency. 2016b. *Toxic Resources Inventory.* Available at: http://www.zoomaru.net/alleventsdata.php?id=185005&display=&eportal=appac&sid=12&rtn=#.V7X7RP7dVD8. Accessed: August 8, 2016.



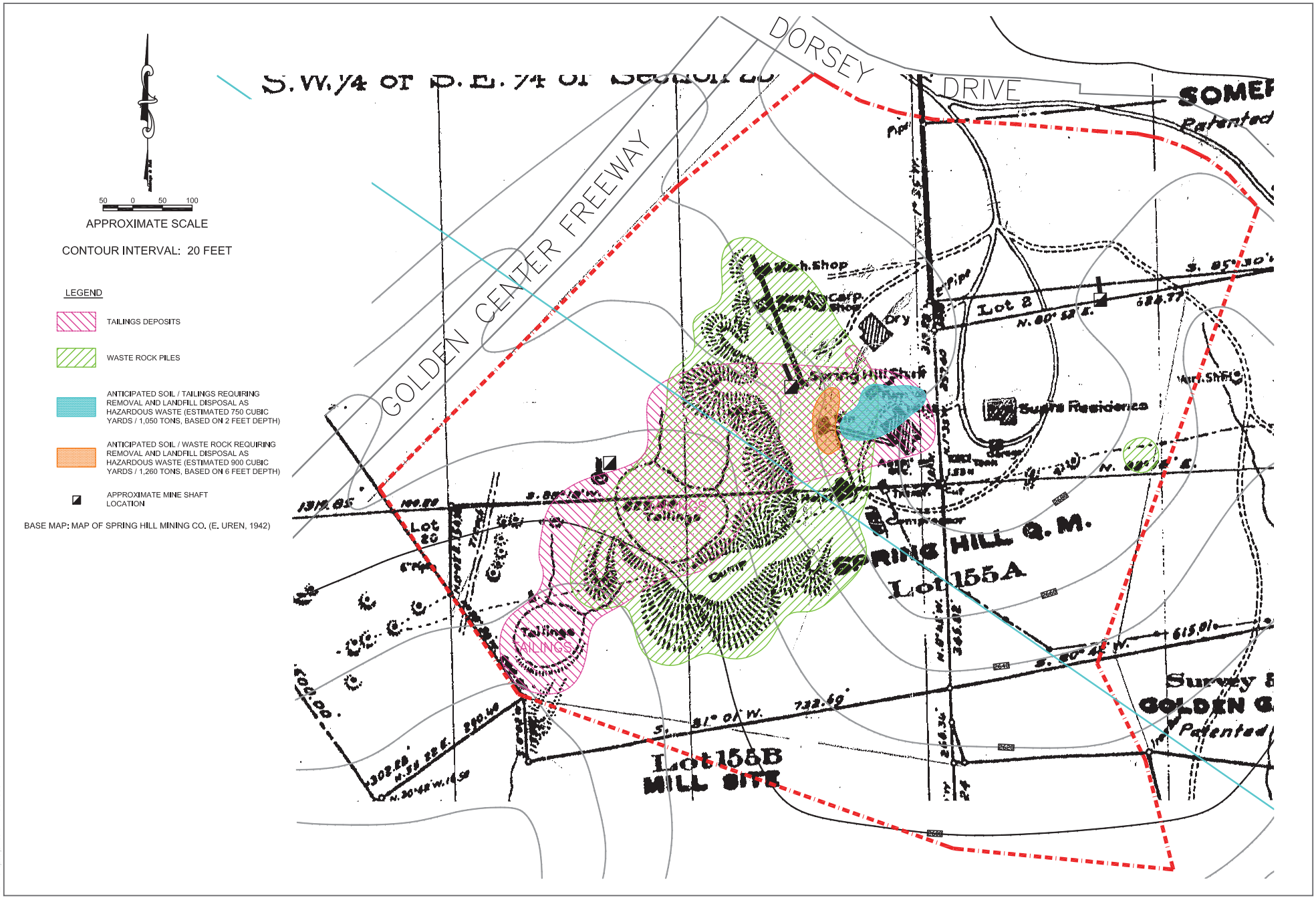
SOURCE: Holdredge & Kull 2007

FIGURE 15-1

Spring Hill Mine Site Plan

Dorsey Marketplace EIR

DUDEK



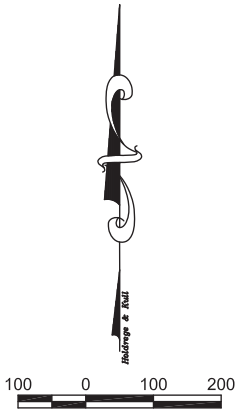
SOURCE: Holdredge & Kull 2008

FIGURE 15-2

Mine Waste Assessment Areas

Dorsey Marketplace EIR

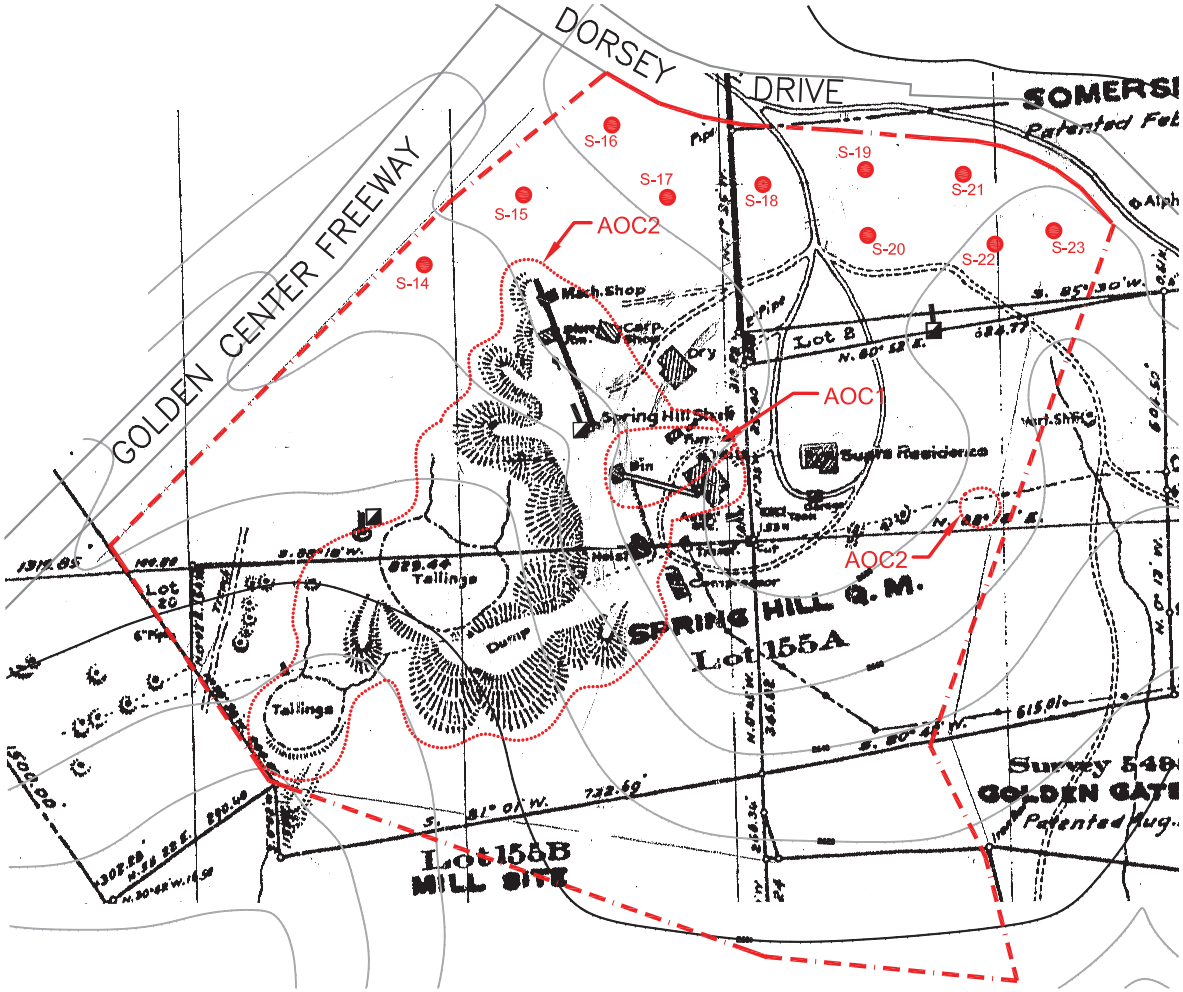
DUDEK



LEGEND

- SITE BOUNDARY
- AREA OF CONCERN (AOC) BOUNDARY
- APPROXIMATE RECORDED LOCATION OF MINE SHAFT
- S-14 APPROXIMATE LOCATION OF BACKGROUND SOIL SAMPLE

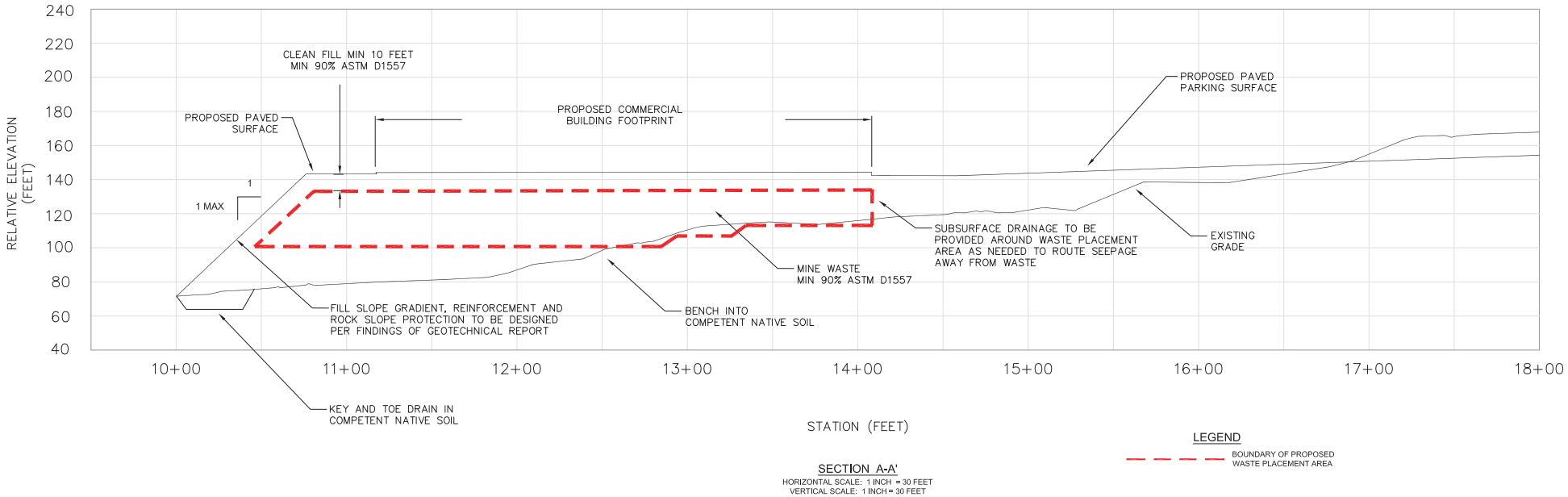
BASE MAP: MAP OF SPRING HILL MINING CO. (E. UREN, 1942)



SOURCE: Holdredge & Kull 2012

FIGURE 15-3
Areas of Concern
Dorsey Marketplace EIR

DUDEK



SECTION A-A'

HORIZONTAL SCALE: 1 INCH = 30 FEET
VERTICAL SCALE: 1 INCH = 30 FEET

SOURCE: Holdredge & Kull 2012

DUDEK

FIGURE 15-4

On-site Containment

Dorsey Marketplace EIR

CHAPTER 16
CEQA-MANDATED SECTIONS

This chapter includes the following considerations that are required to be discussed in an environmental impact report (EIR) in accordance with the California Environmental Quality Act (CEQA):

- Effects Not Found to Be Significant (Section 16.1)
- Significant and Unavoidable Environmental Impacts (Section 16.2)
- Significant and Irreversible Environmental Changes (Section 16.3)
- Growth Inducement (Section 16.4)
- Energy Consumption (Section 16.5)

Two versions of the proposed project are evaluated in this chapter. Alternative A would provide for up to 90 apartment units, approximately 178,960 square feet of commercial space, and a 3,200-square-foot clubhouse. Alternative B would provide 172~~1~~ apartments, approximately 104,350 square feet of commercial space, approximately 8,500 square feet of office space, and a 3,200-square-foot clubhouse.

16.1 EFFECTS NOT FOUND TO BE SIGNIFICANT

This section discusses potential environmental impacts from the proposed Dorsey Marketplace (proposed project) that were found not to be significant based on the analysis in the Notice of Preparation (NOP). The NOP was released for public review on February 11, 2016. No Initial Study was prepared with the NOP, as the City assumed that a number of impacts would be significant or potentially significant even after implementation of mitigation. All potential effects are evaluated in this Draft EIR. Each resource chapter identifies where no impacts would occur and those impacts that were determined to be less than significant.

16.2 SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL IMPACTS

Implementation of the project-specific mitigation measures identified in Chapters 3 through 15 would reduce most of the project's significant impacts to less than significant levels. Alternative A would result in the following significant and unavoidable impact (this impact would be less than significant under Alternative B):

- Impact 8-9: Would the project contribute to a cumulative increase in traffic that conflicts with adopted policies and plans related to intersection and roadway segment function, including consideration of LOS and ADT?

In addition, Alternative A and Alternative B would result in the following significant and unavoidable impact:

- Impact 11-1: Would the project impede the City or state efforts to meet AB 32 standards for the reduction of GHG emissions?

16.3 SIGNIFICANT AND IRREVERSIBLE ENVIRONMENTAL CHANGES

The CEQA Guidelines (14 CCR 15000 et seq.) mandate that an EIR address any significant irreversible environmental changes that would be involved in the proposed action should it be implemented (14 CCR 15126(c)). An impact would fall into this category if:

- The project would involve a large commitment of nonrenewable resources.
- The primary and secondary impacts of the project would generally commit future generations of people to similar uses.
- The project involves uses in which irreversible damage could result from any potential environmental incidents associated with the project.
- The proposed consumption of resources is not justified (e.g., the project results in wasteful use of energy).

Determining whether the proposed project may result in significant irreversible changes requires a determination of whether key resources would be degraded or destroyed in such a way that there would be little possibility of restoring them. The project site is located on an infill brownfield site within an urbanized area of the City of Grass Valley (City). The site supported mining activities in the past but is no longer a viable site for mining. Natural resources in the form of building materials would be used in the construction of the proposed project; these resources have varying degrees of renewability. However, their use would be characteristic of typical development projects and use of these resources for construction of the proposed project is not expected to negatively impact the availability of these resources for other uses. Due to the scale of the proposed project, the use of construction materials and nonrenewable resources would not be unusual or extraordinary, and as a result there would be no significant irreversible environmental effects related to resource consumption during construction.

The project would not result in impacts that commit future generations to similar uses. Under Alternative A, the project would construct 90 residential units, 178,960 square feet of commercial uses, and associated infrastructure. Under Alternative B, the project would construct 172~~1~~ residential units, 104,350 square feet of commercial uses, 8,500 square feet of office uses, and associated infrastructure. The project would be uniquely suited to the proposed residential, office,

and commercial uses. However, should the buildings become vacant in the future it would be feasible for interior renovations to be made to adjust the buildings to a different user or to demolish buildings and develop the site for a different land use.

The proposed project would not introduce highly hazardous land uses or activities to the project site such that there would be a potential for irreversible damage from incidents such as a release of hazardous materials, explosion, or other potentially catastrophic event. The project includes implementation of the approved Removal Action Workplan for the site, which would ensure that the hazardous materials currently present at the site are removed or capped such that occupation of the site does not expose people to adverse effects associated with hazardous materials.

On a permanent, long-term basis, the proposed project would consume energy. However, as discussed further in Section 16.5, the project's energy consumption does not constitute a significant and irreversible environmental change.

16.4 GROWTH INDUCEMENT

CEQA requires a discussion of ways in which the proposed project could induce growth in the project area. The CEQA Guidelines identify a project as growth inducing if it fosters economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment (14 CCR 15126.2(d)). New employees from commercial or industrial development and new population from residential development represent direct forms of growth. These direct forms of growth have a secondary effect of expanding the size of local markets and inducing additional economic activity in the area. A project could indirectly induce growth by reducing or removing barriers to growth or by creating a condition that attracts additional population or new economic activity.

The project's potential to induce growth in the project area is discussed in Chapter 4, Population, Employment, and Housing. In that analysis, the project was found to have a less-than-significant potential to induce growth in the region.

16.5 ENERGY CONSUMPTION

CEQA provides that an environmental impact report shall include a detailed statement identifying all significant effects on the environment of a proposed project, and mitigation measures proposed to minimize significant effects on the environment, including, but not limited to, "measures to reduce the wasteful, inefficient, and unnecessary consumption of energy" (California Public Resources Code, Section 21100(b)(1),(3)).

Appendix F of the CEQA Guidelines, Energy Conservation, includes recommendations for information that should be included in an EIR to "assure that energy implications are considered

in project decisions" (14 CCR 15000 et seq.). Appendix F directs that EIRs should include "discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy (see Public Resources Code section 21100(b)(3))" (14 CCR 15000 et seq.).

Appendix F lists potential energy impacts that may be relevant to the Energy Conservation analysis in an EIR. Where a listed item is applicable or relevant to a proposed project, the EIR should consider it. This analysis applied the following relevant listed items from Appendix F, subdivision (II)(F)(C), to the discussion of impacts: energy requirements and energy use efficiencies of the project by fuel type and amount for each stage of the project, the effects of the project on local and regional energy supplies and on requirements for additional capacity, compliance with existing energy standards, the effects of the project on energy resources, and the project's projected transportation energy use requirements and overall use of efficient transportation alternatives.

Additionally, Appendix F provides a list of potential energy impacts and conservation measures that may be relevant to the discussion of the Project Description. Accordingly, Chapter 2, Project Description, of this EIR includes discussions of utilities and project construction, which address the following relevant items from Appendix F, subdivision (II)(A): energy consuming equipment and processes to be used during the various phases of the project and identification of energy supplies that would serve the project. These issues are also discussed in Chapter 10, Air Quality, and Chapter 14, Public Services and Utilities, of this EIR.

In accordance with Appendix F, this EIR includes relevant information and analyses that address the energy implications of the project. This section represents a summary of the project's anticipated energy needs, impacts, and conservation measures. Information found herein, as well as other aspects of the project's energy implications, are discussed in greater detail elsewhere in this EIR, including in Chapter 8, Transportation; Chapter 10; Chapter 11, Climate Change; and Chapter 14.

16.5.1 Energy Setting

Local Service and Use

The project site is an infill development site and is located in an area where all public services are currently available. The introduction of the proposed project to the project area would increase local demands for electricity and natural gas, which are supplied by PG&E. As demonstrated in the following discussion, the energy demands of the proposed project would be consistent with the anticipated level of economic development and growth in the region, and PG&E would have sufficient available capacity to serve the proposed project. For the purposes of this analysis, energy consumption is measured in kWh or MMBtu. One million British thermal units is equivalent to 293.297 kWh.

Electricity

Pacific Gas & Electric (PG&E) provides electric services to 5.4 million customers throughout a 70,000-square-mile service area in northern and central California (PG&E 2016). The residents of Grass Valley receive their electrical service from PG&E. According to the California Energy Commission (CEC), PG&E consumed approximately 86.5 billion kilowatt-hours (kWh) of electricity in total in 2013 (CEC 2015). PG&E's commercial building electrical consumption was approximately 30.9 billion kWh, and the residential electrical consumption was approximately 31.4 billion kWh.

PG&E receives electric power from a variety of sources. According to PG&E's 2013 Power Content Label, 22% of PG&E's power came from eligible renewables, including biomass/waste, geothermal, small hydroelectric, solar, and wind sources. Large hydroelectric made up 10% of PG&E's power mix (CEC n.d.).

The Overview webpage at the California Energy Almanac, the online database of the CEC, states that statewide electricity generation exceeds 200,000 gigawatt-hours each year, with natural gas as the main source for electricity generation, responsible for 60.5% of the total in-state electric generation system power. In addition, the Renewables Portfolio Standard established a goal for California to increase the amount of electricity generated from renewable energy resources to 20% by 2010 and to 33% by 2020. Currently, California's in-state renewable generation is composed of biomass, geothermal, small hydro, wind, and solar generation sites that make up approximately 19.6% of the total in-state generational output (CEC 2014).

Based on recent energy supply and demand projections in California, statewide annual peak demand is projected to grow an average of 890 megawatts (MW) per year for the next decade, or 1.4% annually, while per capita consumption is expected to remain relatively constant at 7,200–7,800 kWh per person (CEC 2007). In Nevada County, the CEC reported an annual electrical consumption of approximately 656 million kWh in total, with 234 million kWh for non-residential use and 422 million kWh for residential use in 2013. Energy consumption went down in Nevada County for 2014; total consumption was 633 million kWh, of which 227 million was non-residential and 406 million was residential use (CEC, 2016).

Natural Gas

PG&E also provides natural gas service to the Grass Valley area. The system receives gas from PG&E's regional transmission system. (PG&E 2016). The CEC reports that PG&E consumed a total of approximately 480 million British thermal units (MMBtu) of natural gas in 2013, with 87.3 million MMBtu for commercial buildings and 200 million MMBtu for residential use. In Nevada County, total natural gas consumption was approximately 18.79MMBtu in 2016, with 5.89 MMBtu for non-residential use and 12.90 MBtu for residential use.

16.5.2 Regulatory Framework

Federal

Although there are federal regulations addressing energy efficiency in the built environment, fuel efficiency for motor vehicles, energy sources used by the United States, and national conservation goals, none of these regulations and policies applies directly to the proposed project and this analysis of the project's energy consumption.

State

California Environmental Quality Act

Appendix F of the CEQA Guidelines, as discussed previously, calls for discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

Global Warming Solutions Act

Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006 (Chapter 488, Statutes of 2006) enacted Sections 38500–38599 of the California Health and Safety Code. AB 32 establishes regulatory, reporting, and market procedures to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires reduction of statewide GHG emissions to 1990 levels by 2020. The procedures for reducing GHG emissions will relate to the generation and efficient use of energy. The California Air Resources Board adopted the Climate Change Scoping Plan in 2008, which is the state's plan to achieve the statewide GHG reductions required by AB 32. The most significant proposed GHG reductions are recommended through improving emission standards for light-duty vehicles, implementation of the Low-Carbon Fuel Standard, energy efficiency measures in buildings and appliances, and a renewable portfolio standard for electricity production.

California Energy Commission

The CEC's Integrated Energy Policy Report set forth policies that would enable the state to meet its energy needs under the carbon constraints established in the 2006 Global Warming Solutions Act. The Integrated Energy Policy Report also provides a set of recommended actions to achieve these policies.

Title 24, California Code of Regulations, Energy Efficiency Standards

Title 24 sets the energy efficiency standards for residential and nonresidential buildings. The CEC has adopted changes to the Building Energy Efficiency Standards to accomplish the following:

- Respond to California's energy crisis to reduce energy bills, increase energy delivery system reliability, and contribute to an improved economic condition for the state
- Respond to the AB 970 (Statutes of 2000) urgency legislation to adopt and implement updated and cost-effective building energy efficiency standards
- Respond to various statutes of 2001, which included urgency legislation to adopt energy efficiency building standards for outdoor lighting
- Emphasize energy efficiency measures that save energy at peak periods and seasons, improve the quality of installation of energy efficiency measures, incorporate recent publicly funded building science research, and collaborate with California utilities to incorporate results of appropriate market incentives programs for specific technologies

Additionally, the 2013 California Green Building Standards Code, or CALGreen Code (24 CCR 11), which took effect on January 1, 2014, requires buildings to reduce energy and water consumption and establishes specific performance standards that appliances and fixtures must meet. The code contains mandatory and voluntary measures for site planning and design, energy efficiency, water efficiency and conservation, materials conservation, resource use efficiency, and environmental quality.

State of California Energy Plan

The State Energy Plan, drafted by the CEC, identifies emerging trends in energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The plan recommends reductions in congestion and increased efficiency in the use of fuel supplies. The plan also encourages urban designs that reduce vehicle miles traveled and promote pedestrian and bicycle access.

Clean Energy and Pollution Reduction Act

Under Senate Bill 350, signed into law in October2015, the Clean Energy and Pollution Reduction Act of 2015 updates the Renewables Portfolio Standard and applies to all electricity retailers in California. These entities must meet the Renewables Portfolio Standard goals of 33% of retail sales from eligible renewables by the end of 2020, 40% by the end of 2024, 45% by 2027 and 50% by 2030.

California's Energy Storage Law

California's Energy Storage Law (Assembly Bill (AB) 2514) (Chapter 469, Statutes of 2010) requires the governing board of each publicly-owned utility to "determine appropriate targets, if any, for the utility to procure viable and cost-effective energy storage systems (Ca. Pub. Util. Code Section 2836(b)(1)). AB 2514 also requires that "all procurement of energy storage systems" by a publicly owned utility "shall be cost-effective" (California Public Utilities Code Section 2836.6).

Local Regulations

Neither the City of Grass Valley nor the NSAQMD have adopted any policies or regulations that specifically define energy consumption or conservation standards and goals. The City is currently working to prepare an energy action plan.

16.5.3 Impacts

Thresholds of Significance

Appendix F of the CEQA Guidelines does not provide a specific numeric threshold to evaluate the potential significance of the energy effects of a proposed project. Rather, the emphasis is on reducing "the wasteful, inefficient, and unnecessary consumption of energy" (Public Resources Code Section 21100(b)(1),(3)). In order to use this standard as a threshold of significance, the following criteria are considered in this analysis:

Project-related energy usage would be considered "wasteful, inefficient, and unnecessary" if:

- The project were to violate state and federal energy standards, including Title 24 of the California Code of Regulations.
- The project consumed a substantially greater amount of energy, in either the construction or operational phase, than a similar project.

The project objectives could be achieved through a feasible alternative that would substantially reduce the amount of energy required over the life of the project or through a feasible alternative that would include use of alternative fuels or energy systems.

Project Impacts

Impact 16-1: Would the project cause a temporary increase in wasteful, inefficient, and unnecessary energy consumption due to construction?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None Required	None Required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

As discussed in Chapter 2, both Alternative A and Alternative B would require very similar construction that would last for an approximately 60-month-long construction period. The construction phases anticipated to occur include demolition of the existing building foundations and other mining remnants on site, site clearing and hazard remediation, grading, and trenching for utilities followed by building construction, paving, architectural coating, and installation of landscaping.

Heavy-duty construction equipment associated with demolition and construction activities would rely on diesel fuel, as would haul trucks involved in removing the materials from demolition of the existing on-site buildings.

Heavy-duty construction equipment of various types would be used during each phase of construction. The California Emissions Estimator Model (CalEEMod) analysis discussed in Chapter 10, and included in Appendix I to this EIR, includes the proposed construction schedule and assumed equipment usage. Based on that analysis, over all phases of construction, diesel-fueled, on-site construction equipment would run for an estimated 8,700 hours, as summarized in Table 16-1.

Table 16-1
Construction Equipment

Equipment Description	Hours
345 CAT Excavator	480
320 CAT Excavator	480
314 CAT Excavator	360
308 CAT Excavator	360
120 CAT Motor Grader	200
140 CAT Motor Grader	200
633 CAT Scrapers	720
D10 CAT Dozers	600
D8 CAT Dozers	600
750 John Deere Dozer	420

Table 16-1
Construction Equipment

Equipment Description	Hours
815 CAT Compactors	600
563 CAT Compactor -	600
433 CAT Compactor	400
950 CAT Loader	400
938 CAT Loader	400
924 CAT Loader	400
430 CAT Backhoes	400
210 John Deere Skip Loaders	400
Kenworth Water Trucks 2000-4000 gal	680
345 CAT Excavator	480

Source: Appendix I.

Assuming an average diesel fuel efficiency of 1.74 gallons per hour, on-site construction equipment would consume approximately 15,138 gallons of diesel. With a conversion factor of 40.7 kWh per gallon of diesel, the energy consumption due to hauling would be approximately 616,116.6 kWh (Appendix I).

As reported in the Removal Action Workplan, it is expected that approximately 150 total truck trips (which is 300 one-way trips) would be required to haul the debris from grading (Appendix J-3A). Over the grading period, this would generate approximately 6,000 vehicle miles traveled (VMT). Assuming an average diesel fuel efficiency of 6 miles per gallon for medium-heavy duty and heavy-heavy duty haul trucks (EIA 2013), hauling would consume approximately 36,000 gallons of diesel. With a conversion factor of 40.7 kWh per gallon of diesel, the energy consumption due to hauling would be 1,465,200 kWh.

During the remaining construction phases, it is expected that vendors will travel to and from the site in diesel-fueled vehicles to deliver materials. CalEEMod estimates that 102 total trips will be taken by vendors, which would generate approximately 6.6 VMT. Assuming an average diesel fuel efficiency of 6 miles per gallon (EIA 2013), vendor trips would consume approximately 673.2 gallons of diesel. With a conversion factor of 40.7 kWh per gallon of diesel, the energy consumption due to vendor trips to and from the site would be approximately 27,388.24 kWh.

The number of construction workers required would vary based on the construction phase and activity. The fuel construction workers would require for transportation would depend on the total number of worker trips estimated for the duration of construction activity. CalEEMod estimates that construction will generate 416 worker trips, which would generate approximately 16.8 VMT. Assuming an average fuel efficiency of 17.5 miles per gallon (DOT 2014), demolition and construction activities on site would use approximately 6,988.8 gallons of gasoline for construction

worker trips. With a conversion factor of 33.7 kWh per gallon of gasoline, the annual energy consumption due to gasoline-fueled transportation by construction worker trips to and from the project site would be 284,444.16 kWh.

According to a study by the U.S. Energy Information Administration, California's transportation sector consumed a total of 14.1 billion gallons of gasoline and 3 billion gallons of diesel (EIA 2013). Based on the fuel usage amounts presented in the previous text, demolition of the existing buildings on site and construction would use approximately 6,989 gallons of gasoline and 51,801 gallons of diesel. This would comprise less than 0.00005% of gasoline fuel consumption and 0.0017% of diesel fuel consumption in the State.

Temporary electric power for as-necessary lighting and electronic equipment such as computers inside temporary construction trailers would be provided by PG&E. The electricity used for such activities would not result in a net increase in on-site electricity use over the existing buildings' electricity usage, as the daily demand for lighting and electronics at the buildings currently on site would be higher than that for construction.

Project construction would also involve use of non-renewable or slowly renewable resources used to create building materials including certain types of lumber and other forest products; aggregate materials used in concrete and asphalt such as sand, gravel, and stone; metals such as steel, copper, and lead; petrochemical construction materials such as plastics; and water.

Construction would comply with all relevant energy-related regulations by conserving energy and natural resources to the extent feasible. The energy demands due to diesel and gasoline use during construction would be small relative to statewide and local demands for fuel use, as discussed previously. The energy consumption during project construction would be commensurate with typical construction projects and would not use energy wastefully or inefficiently. Therefore, the temporary short-term consumption energy consumption impacts due to construction are considered **less than significant**.

Impact 16-2: Would the project cause a permanent increase in wasteful, inefficient, and unnecessary energy consumption or fail to comply with state and federal energy standards?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None Required	None Required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A

The total annual energy demands of Alternative A are described and quantified in the following text.

Daily Operations

As discussed in Chapter 2, Alternative A proposes to construct approximately 178,960 square feet of commercial building space, 90 multi-family dwelling units and a 3,200-square foot clubhouse. The project would also construct a new circulation system throughout the proposed project and would install landscaping and recreational facilities.

As described in Chapter 4, Alternative A is expected to generate between 260 and 280 jobs and the addition of 90 dwelling units is expected to result in approximately 184 new residents.

Daily operation of Alternative A would generate demand for electricity, natural gas, and water supply, as well as generating wastewater requiring off-site conveyance, treatment, and disposal.

PG&E uses a variety of renewable energy sources to generate a portion of its electricity, and these sources would contribute to the project's electricity supply. Due to the nature of the project site, which is located in a developed, landlocked area, it would be infeasible to use on-site renewable energy sources such as hydropower, biodiesel, or ocean-dependent technologies. However, consistent with the California Green Building Code, solar panels would be provided in association with the proposed residential land use.

The CalEEMod program estimates energy usage associated with building systems that are regulated under Title 24 (such as the heating and cooling system), lighting, and use of office equipment, appliances, plug-ins, and other sources not covered by Title 24. The CalEEMod program estimates that the commercial project components would consume 1.30789e+006 British thermal units (kBtu) of natural gas and 2,582,170 kWh of electricity (including for parking lot lighting) annually (Appendix I). The CalEEMod modeling results also indicate that the residential component of the project would consume 971,962 kBtu of natural gas annually and the residences would consume 428,315 kWh. Thus, Alternative A would consume 2,279,852 kBtu of natural gas annually and 3,010,485 kWh annually (Appendix I).

The CalEEMod modeling estimates that Alternative A would generate approximately 8,338.8 daily vehicle trips during the week. It is noted that the traffic impacts analysis demonstrates that a substantial portion of these daily trips would remain on site or would be considered pass-by trips. However, for the purposes of this energy consumption analysis, all of the trips (including those that remain internal to the site and those that are pass-by trips) are considered. Using the default assumptions in CalEEMod regarding trip length and total VMT, the project is expected generate a total of 15,680,281 VMT annually (Appendix I). Assuming an average fuel efficiency of 17.5 miles per gallon (DOT 2014), the proposed project would increase consumption of gasoline by 274,404,918 gallons annually. With a conversion factor of 33.7 kWh per gallon of gasoline, the annual energy consumption due to these trips would be 9,247,445,720 kWh.

There would be an increase in local energy consumption due to the proposed project. However, because the project would incorporate energy-efficient elements as required by the City's Building Code, the energy consumption of Alternative A would not be wasteful or inefficient. The demand for housing and jobs in the City demonstrates that the energy consumption used by this or any in-fill project would not be unnecessary. Therefore, the impact of energy consumption at the proposed project is considered **less than significant**.

Operations would also expel energy through trash collection, the recycling process, and the greenhouse gases expelled by recomposing solid waste in landfills.

The use of deciduous trees in purposeful landscaping will reduce a buildings need for energy by the shade cooling the building and the lack of leaves allowing more sunlight and thus heat on the exterior of the building. Furthermore, the use of trees and vegetation extensively throughout the site would reduce the local urban heat island effect and thus reduce the need for cooling during the summer.

Additional Project Design Features

CEQA Guidelines, Appendix F, Energy Conservation, states that the "goal of conserving energy implies the wise and efficient use of energy." It lists three means of achieving this goal: decreasing overall per capita energy consumption, decreasing reliance on fossil fuels, and increasing reliance on renewable energy sources" (14 CCR 15000 et seq.). Public transit, such as fixed bus routes, reduce vehicle trips and result in decreased demand for transportation-related energy. Grass Valley maintains six public transit routes including one which goes up to Nevada City. The project site is located along two different routes and is directly adjacent to a transfer point.

Additionally, Alternative A would include the use of recycled materials in construction and the recycling or reuse of construction materials and debris, and would include other energy conservation features such as parking lot shade trees and Energy Star appliances.

Conclusion

Overall, the proposed project would result in an increase in energy consumption, with the project requiring a total of 9,247,445,720 kWh associated with vehicle trips to/from and within the project site, 3,010,485 kWh in on-site electricity consumption, and 2,279,852 kBtu in on-site natural gas consumption. As noted in Section 16.5.1, Energy Setting, the project's energy demands would be consistent with the anticipated level of economic development and growth in the region. The demand for local housing and commercial spaces in the project area demonstrate that the energy consumption of these facilities would not be unnecessary. Therefore, impacts related to wasteful, inefficient, or unnecessary energy consumption would be **less than significant.**

Alternative B

Daily Operations

As discussed in Chapter 2, Alternative B proposes to construct approximately 104,350 square feet of commercial building space, 8,500 square feet of office space and 172~~1~~ multi-family dwelling units. The project would also construct a new circulation system throughout the proposed project and would install landscaping and recreational facilities. As discussed in Chapter 4, Alternative B would be expected to generate between 170 and 190 jobs and to support a residential population of 349 people.

The daily operation of Alternative B would generate demand for electricity, natural gas, and water supply, as well as generating wastewater requiring off-site conveyance, treatment, and disposal. PG&E uses a variety of renewable energy sources to generate a portion of its electricity, and these sources would contribute to the project's electricity supply. Due to the nature of the project site, which is located in a developed, landlocked area, it would be infeasible to use on-site renewable energy sources such as hydropower, biodiesel, or ocean-dependent technologies. However, consistent with the California Green Building Code, solar panels would be provided in association with the proposed residential land use.

The CalEEMod program estimates energy usage associated with building systems that are regulated under Title 24 (such as the heating and cooling system), lighting, and use of office equipment, appliances, plug-ins, and other sources not covered by Title 24. The CalEEMod program estimates that the office and commercial project components would consume 813,649 British thermal units (kBtu) of natural gas and 1,660,410 of electricity (including for parking lot lighting) annually (Appendix I).

The CalEEMod modeling results also indicate that the multiple-family component of the project would consume 1.84673e+006 kBtu of natural gas annually and the multi-family residences would consume 813,798 kWh. Thus Alternative B would consume 2,660,379 kBtu annually and 813,798 kWh annually (Appendix I).

The CalEEMod modeling estimates that Alternative B would generate approximately 8,872.67 daily vehicle trips during the week. It is noted that the traffic impacts analysis demonstrates that a substantial portion of these daily trips would remain on site or would be considered pass-by trips. However, for the purposes of this energy consumption analysis, all of the trips (including those that remain internal to the site and those that are pass-by trips) are considered. Using the default assumptions in CalEEMod regarding trip length and total VMT, the project is expected generate a total of 17,584,086 VMT annually (Appendix I). Assuming an average fuel efficiency of 17.5 miles per gallon (DOT 2014), Alternative B would increase consumption of gasoline by 1,008,805 gallons annually. With a conversion factor of 33.7 kWh per gallon of gasoline, the annual energy consumption due to these trips would be 33,861,926 kWh.

There would be an increase in local energy consumption due to Alternative B. However, because the project would incorporate energy-efficient elements as required the City's Building Code, the energy consumption of the proposed project would not be wasteful or inefficient. The demand for housing and jobs in the City demonstrates that the energy consumption used by this or any in-fill project would not be unnecessary. Therefore, the impact of energy consumption from Alternative B is considered **less than significant**.

Operations would also expel energy through trash collection, the recycling process, and the greenhouse gases expelled by recomposing solid waste in landfills.

The use of deciduous trees in purposeful landscaping will reduce a buildings need for energy by the shade cooling the building and the lack of leaves allowing more sunlight and thus heat on the exterior of the building. Furthermore, the use of trees and vegetation extensively throughout the site would reduce the local urban heat island effect and thus reduce the need for cooling during the summer.

Additional Project Design Features

CEQA Guidelines, Appendix F, Energy Conservation, states that the "goal of conserving energy implies the wise and efficient use of energy." It lists three means of achieving this goal: decreasing overall per capita energy consumption, decreasing reliance on fossil fuels, and increasing reliance on renewable energy sources" (14 CCR 15000 et seq.). Public transit, such as fixed bus routes, reduce vehicle trips and result in decreased demand for transportation-related energy. Grass Valley maintains six public transit routes including one which goes up to Nevada City. The project site is located along two different routes and is directly adjacent to a transfer point.

Additionally, Alternative B would include the use of recycled materials in construction and the recycling or reuse of construction materials and debris, and would include other energy conservation features such as parking lot shade trees and Energy Star appliances.

Conclusion

Overall, the proposed project would result in an increase in energy consumption, with the project requiring a total of 33,861,926 kWh associated with vehicle trips to/from and within the project site, 813,798 kWh in on-site electricity consumption, and 2,660,379 kBtu in on-site natural gas consumption. As noted in Section 16.5.1, the project's energy demands would be consistent with the anticipated level of economic development and growth in the region. The demand for local housing and commercial spaces in the project area demonstrate that the energy consumption of these facilities would not be unnecessary. Therefore, impacts related to wasteful, inefficient, or unnecessary energy consumption would be less than significant.

Impact 16-3: Could the proposed project objectives be achieved through a feasible alternative that would substantially reduce the amount of energy required over the life of the project or through a feasible alternative that would include use of alternative fuels or energy systems?

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than Significant	Less than Significant
Mitigation measures:	None Required	None Required
Significance after mitigation:	Less than Significant	Less than Significant

Alternative A and Alternative B

As discussed under Impacts 16-1 and 16-2, both Alternatives would have a less than significant impact related to energy consumption during construction and during operation. The approximate amount of energy consumed by the project is also identified previously. CEQA Guidelines, Appendix F, Energy Consumption, states that the alternatives in an EIR should be compared "in terms of overall energy consumption and in terms of reducing wasteful, inefficient and unnecessary consumption of energy" (14 CCR 15000 et seq.). The analysis of project alternatives provided in Chapter 17 of this EIR includes consideration of whether any of the feasible project alternatives would substantially reduce the amount of energy required over the life of the project and finds that each of the alternatives would result in reduced overall energy consumption compared to Alternative A and B; however, this is because the alternatives would either change the proposed land use or reduce the size of the proposed project. None of these alternatives would result in a more efficient use of energy. As the local demand for housing, employment, and retail/commercial services increases, energy will be consumed in providing those services. A reduction in the amount of housing or commercial and office space developed on site would not necessarily reduce energy consumption, as local residents would continue to drive out of the City to seek commercial/retail services and commute to places of employment. Therefore, both Alternative A and Alternative B will have less than significant impacts.

16.5.4 Mitigation Measures

No mitigation measures are required.

16.6 REFERENCES CITED

14 CCR 15000–15387 and Appendices A–L. Guidelines for Implementation of the California Environmental Quality Act, as amended.

24 CCR 11. California Green Building Standards Code (CALGreen). January 1, 2014.

California Public Resources Code, Sections 2100—21177. California Environmental Quality Act (CEQA), as amended.

California Public Utilities Code Section 2836.

CEC. 2007. California Energy Demand 2008–2018 Staff Revised Forecast. CEC-200-2007-015-SF2. November 2007.

CEC. 2014. "Overview." California Energy Almanac. http://www.energyalmanac.ca.gov/. 2014.

CEC. 2016. *Electricity Consumption by County*. http://ecdms.energy.ca.gov/elecbycounty.aspx. Accessed June 6, 2016.

EIA (Energy Information Administration). 2013. *Annual Energy Outlook 2013 with Projections to 2040*. DOE/EIA-0383(2013). U.S. Energy Information Administration, Independent Statistics and Analysis. April 2013. http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf.

DOT (U.S. Department of Transportation). 2014. "Table 4-23: Average Fuel Efficiency of U.S. Light Duty Vehicles." Bureau of Transportation Statistics. http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_04_23.html.

PG&E (Pacific Gas & Electric). 2016. "Company Profile." Accessed 2016. http://www.pge.com/en/about/company/profile/index.page.

CHAPTER 17
ALTERNATIVES TO THE PROPOSED PROJECT

17.1 INTRODUCTION

Pursuant to the California Environmental Quality Act (CEQA) Guidelines, environmental impact reports (EIRs) are required to "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" (14 CCR 15126.6(a)). This alternatives analysis is prepared in support of CEQA's goals to foster informed decision making and public participation (14 CCR 15126.6(a)). An EIR is not required to evaluate the environmental impacts of alternatives at the same level of detail as the proposed project, but it must include enough information to allow meaningful evaluation, analysis, and comparison with the proposed project.

The alternatives analysis is required even if the alternatives "would impede to some degree the attainment of the project objectives, or would be more costly" (14 CCR 15126.6(b)). An EIR must evaluate "only those alternatives necessary to permit a reasoned choice" (14 CCR 15126.6(f)) and does not need to consider "every conceivable alternative" to a project (14 CCR 15126.6(a)). The alternatives evaluated should be "potentially feasible" (14 CCR 15126.6(a)), but inclusion of an alternative in an EIR does not constitute definitive evidence that the alternative is in fact "feasible." The final decision regarding the feasibility of alternatives lies with the decision makers for a given project who must make the necessary findings addressing the feasibility of alternatives for avoiding or substantially reducing a project's significant environmental effects (California Public Resources Code, Section 21081; see also 14 CCR 15091).

This chapter identifies the alternatives that were included for analysis, evaluates the environmental impacts associated with them, and compares the impacts with those of the proposed Dorsey Marketplace (proposed project). This chapter also identifies those alternatives considered by the City of Grass Valley (City) but not carried forward for detailed analysis, and it describes the basis for the Town's decision to omit those alternatives from the detailed analysis.

In conformity with CEQA, the purpose of this analysis is to focus on alternatives that are potentially feasible, and that would avoid or substantially lessen any of the significant effects of the project. It is noted that the analysis in the Environmental Analysis, Chapters 3 through 15, finds that the proposed project would result in significant and unavoidable impacts. Most of the project's significant or potentially significant impacts would be reduced to less than significant levels with implementation of the mitigation measures included in this EIR. Those impacts that would remain significant and unavoidable are addressed in Section 16.2, Significant and Unavoidable Environmental Impacts.

17.2 PROJECT OBJECTIVES

The primary objectives of the proposed project are set forth in Chapter 2, Project Description, of this Draft EIR. The project applicant has set forth the following objectives for the proposed project:

- Create a high-quality mixed-use infill project combining residential, retail, and community uses through the re-use of an existing brownfield site consistent with the City's plans for the Core Priority Development Area and its Economic Strategic Plan.
- Develop an infill site adjoining and proximate to existing infrastructure, high density residential, affordable and senior housing, Sierra Nevada Memorial Hospital and medical offices, and existing businesses along Idaho-Maryland Road.
- Construct the Spring Hill Drive connector between Dorsey Drive and Idaho Maryland Road, consistent with the City's General Plan.
- Incorporate safe and convenient walking paths, access to public transit, enhanced bicycle circulation.
- Redevelop the property to allow for the environmental clean-up of a brownfield former mining site.
- Develop the project site in such a way as to make a positive contribution to the City's satisfaction of its Regional Housing Needs Allocation through the creation of new quality high-density market-rate housing.
- Create new retail uses that will capture more local sales tax dollars, reducing the amount of sales tax leakage from City and County residents shopping in other jurisdictions, and reducing vehicle miles traveled, air quality impacts and greenhouse gas emissions associated with shopping destinations outside the area.
- Develop a retail mixed use center that incorporates quality design, local art and community amenities that delivers a lifestyle oriented experience.
- Develop a diverse mix of retail uses that allows a single vehicle trip to the project site verses multiple vehicle trips to a number of retail locations to enjoy a similar shopping experience, thereby reducing vehicle miles traveled, air quality impacts and greenhouse gas emissions.
- Develop a mixed-use project that includes high-density residential uses to reduce the need for vehicular trips to satisfy resident retail needs.

17.3 ALTERNATIVES ANALYSIS

Throughout Chapters 4 through 15, Alternative A and Alternative B have been evaluated at an equal level of detail. This section evaluates three additional alternatives to the proposed project,

including two variations of the No Project Alternative. The No Project Alternative is a required element of an EIR pursuant to Section 15126.6(e) of the CEQA Guidelines that examines the environmental effects that would occur if the project were not to proceed. The other alternatives are discussed as part of the "range of reasonable alternatives." The environmental effects of each alternative relative to the environmental effects of Alternative A and Alternative B are evaluated below. The conclusions from this analysis are listed in the alternatives summary matrix provided at the end of this discussion.

The project alternatives were chosen based on a balancing of considerations of each alternative's ability to best meet the project objectives stated above and to avoid or substantially lessen the significant effects of the proposed project. The selected alternatives constitute a reasonable range of project alternatives due to their consideration of different variations in the size and layout of proposed project components. As noted previously, the intent of this alternatives analysis is to identify a means of avoiding or substantially lessening any of the significant effects of the proposed project. The analysis throughout chapters 4 through 15 show that under either Alternative A or Alternative B, the project would result in no significant and unavoidable environmental effects. The project would result in 30 significant and potentially significant impacts that would be reduced to less-than-significant levels with implementation of the mitigation measures identified in this EIR.

The project alternatives are evaluated as part of the "range of reasonable alternatives" required under CEQA. They are described in the following subsections. The alternatives addressed in this section are listed below, followed by a more detailed discussion of each.

Alternatives Considered but Rejected

Bifurcation of the Spring Hill Extension. During the NOP comment period, a number of concerns were raised that traffic would be negatively impacted on Idaho-Maryland Road. In order to alleviate these concerns, consideration was given to an alternative would bifurcate Spring Hill Drive so that it would not provide a connection between Dorsey Drive and Idaho-Maryland Road. However, by bifurcating Spring Hill Drive within the project site, the project would no longer be consistent with the Circulation Element of the General Plan. In addition, the City has maintained an easement on the property specifically for the extension of Spring Hill. Thus this alternative is considered infeasible because it would impede attainment of the City's established transportation plans.

17.3.1 Alternative 1a: No Project/No Build

Under the No Project/No Build Alternative, the project site would remain in its current condition. No building demolition, grading, remediation, or new construction would occur. The site would remain vacant, and the existing chaparral and woodlands would not be removed.

Land Use

Alternative A and Alternative B would alter the land use of the project site. Implementation of mitigation measures specified in Chapter 3, Land Use, would ensure these changes would result in less than significant impacts related to consistency with policies and regulations. The No Project/No Build Alternative would result in no changes to land uses in the project vicinity. However, the project site is anticipated to be developed under the City's Core Priority Development Area and its Economic Strategic Plan. The No Project/No Build Alternative would be inconsistent with these plans, but would not preclude development of the site at a future time. Thus there would be no land use impacts under this alternative. Although land use impacts would be less than significant under the Alternative A and Alternative B, there would be no land use impacts under the No Project/No Build Alternative. The No Project/No Build Alternative would have somewhat reduced land use impacts compared to Alternative A and Alternative B.

Population and Housing

Alternative A and Alternative B would not result in any significant impacts associated with the provision of housing nor would the project induce substantial growth elsewhere in the City. The No Project/No Build Alternative would not contribute to any impacts to housing or induce growth because there would be no change to the existing conditions and there would be no new construction. However, none of the residential or commercial land uses proposed for the site would be developed, thus the provision of high-density residential land uses that may be capable of meeting some of the City's need for multi-family housing would not be achieved under this alternative. Compared to Alternative A and Alternative B, the No Project/No Build Alternative would have greater impacts related to population and housing because it would not provide any new multi-family housing.

Biological Resources

Alternative A and Alternative B would result in potentially significant impacts to biological resources associated with the loss of protected trees, special status plant species, and nesting birds. With implementation of mitigation measures specified in Chapter 6, these impacts would be reduced to less than significant levels. The No Project/No Build Alternative would result in no changes to biological resources. No nesting birds would be disturbed and all existing trees would remain in place.

While all of the biological resource impacts of Alternative A and Alternative B would be reduced to less than significant levels with implementation of mitigation measures, no development would occur under the No Project/No Build Alternative and there would be no loss of or disturbance to habitat or protected trees. Therefore, the No Project/No Build Alternative would have reduced biological resources impacts compared to Alternative A and Alternative B.

Cultural Resources

Alternative A and Alternative B would result in potentially significant impacts associated with disturbance of archaeological resources. There is a low potential for project construction to disturb unknown subsurface prehistoric or historic resources and human remains; mitigation is included that would reduce potential impacts to a less than significant level. The No Project/No Build Alternative would result in no potential to disturb existing buildings or subsurface cultural resources or human remains and would avoid these potential impacts and thus would have reduced cultural resource impacts compared to Alternative A and Alternative B.

Visual Resources

Alternative A and Alternative B would result in potentially significant impacts to visual resources associated with loss of trees and changes in the visual character of the project site. Mitigation measures are identified to reduce these impacts to less than significant levels by identifying performance standards for project site landscaping to ensure that effective visual screening of the proposed development is provided.

Under the No Project/No Build Alternative, no site remediation or construction would occur; as a result, the No Project/No Build Alternative would result in no changes to existing visual conditions and visual character of the site. The hillside and ponderosa pine forest vegetation would not be changed or altered under this alternative. Therefore, the No Project/No Build Alternative would have reduced aesthetic impacts compared to Alternative A and Alternative B.

Transportation and Circulation

Alternative A would increase traffic in the project vicinity due to the introduction of commercial and residential land uses to the currently vacant project site. Implementation of mitigation measures would be necessary to ensure that most impacts to traffic and circulation in the vicinity are reduced to less than significant levels, however one impact would remain significant and unavoidable due to the length of vehicle queues at the Dorsey Drive/SR 20/49 interchange in the cumulative plus project scenario. Alternative B would generate less traffic than Alternative A, but would also increase traffic in the project vicinity and require implementation of mitigation measures requiring the project applicant to provide a fair-share contribution to installation of traffic signals at a few intersections. Traffic impacts under Alternative B would all be reduced to less than significant levels with implementation of mitigation. Since the No Project/No Build Alternative would not introduce any development to the project site, this alternative would result in no changes to transportation and circulation conditions in the project vicinity compared to existing conditions. The No Project/No Build Alternative would have no impacts on transportation and circulation. Therefore, the No Project/No Build Alternative would have reduced transportation and circulation impacts compared to Alternative A and Alternative B.

Noise

Alternative A and Alternative B would result in potentially significant impacts associated with noise generated during project construction and operation. Mitigation measures are identified to ensure that noise exposure for residents of the project site and existing residents on adjacent parcels remain within the acceptable noise level range as established by the City of Grass Valley. The No Project/No Build Alternative would avoid all noise generation from site remediation, construction, and increases in traffic associated with Alternative A and Alternative B. Therefore, the No Project/No Build Alternative would have reduced noise impacts compared to Alternative A and Alternative B.

Air Quality

Alternative A and Alternative B would result in potentially significant air quality impacts during project construction and project operation. Implementation of mitigation measures would reduce the air pollutant emissions during construction to a less than significant level. Under the No Project/No Build Alternative, no site remediation or construction would occur, and the No Project/No Build Alternative would neither increase nor decrease emissions of air pollutants. Thus, the No Project/No Build Alternative would result in no impacts to air quality.

Greenhouse Gas Emissions

Alternative A and Alternative B would result in a significant and unavoidable impact related to greenhouse gas (GHG) emissions during project operation. Implementation of mitigation measures would reduce the GHG emissions, but emissions would remain significant and unavoidable. Under the No Project/No Build Alternative, there would be no operational emissions of GHGs. Thus, the No Project/No Build Alternative would result in no impacts associated with GHG emissions.

Geology, Soils, Seismicity, and Paleontology

Alternative A and Alternative B would not expose future residents to risks due to earthquakes or unstable soils and impacts would be less than significant. Compliance with existing state and local regulations would ensure that substantial erosion or loss of topsoil would be less than significant. There is low potential for the site to support paleontological resources, disturbance of which would be a potentially significant impact. Mitigation is identified to reduce this impact to less than significant.

No impacts to geology or soils or paleontological resources would occur under the No Project/No Build Alternative because there would be no site disturbance, grading, or project construction. Therefore, the No Project/No Build Alternative would have reduced impacts to geology, soils, seismicity, and paleontology compared to Alternative A and Alternative B.

Hydrology and Water Quality

Alternative A and Alternative B would incorporate BMPs and meet NPDES permit requirements, and thus would not result in any significant impacts to groundwater supply, or increases in sediment and erosion on local waterways during construction. Further, the project would include three small stormwater detention basins that would be sized sufficiently to ensure that the project does not result in an increase in stormwater runoff rates from the project site, thus the project's stormwater flows would not exceed capacity of existing stormwater infrastructure. All of these impacts were determined to be less than significant.

There would be no impacts to hydrology or water quality related to an increase in stormwater, loss of groundwater, or inadequate stormwater infrastructure under the No Project/No Build Alternative because there would be no increase in impervious surfaces under this alternative and no development. Therefore, impacts would be reduced compared to Alternative A and Alternative B.

Public Services and Utilities

Alternative A and Alternative B would have less than significant impacts related to existing public services including police, fire, solid waste disposal, emergency access, parks, libraries, schools, or dry utilities. Alternative A and Alternative B would increase demand for these services and utilities but the demand would be within the levels anticipated by the applicable service providers and impacts would remain less than significant.

The No Project/No Build Alternative would not develop new housing, commercial space, or office space that would generate an increase in population requiring public services and utilities to accommodate the increase in demand. Therefore, the No Project/No Build Alternative would have reduced public services and utilities impacts compared to Alternative A and Alternative B.

Hazards and Hazardous Materials

Alternative A and Alternative B would not result in any impacts related to the use, transport, or handling of hazards and hazardous materials during project construction and operation. However, Alternative A does include remediation of the site. The No Project/No Build Alternative would result in no changes to hazardous conditions and would not include remediation. No new hazardous materials (such as fuel for construction equipment and cleaning products) would be used at the project site.

Impacts related to hazards and hazardous materials would be less than significant under Alternative A and Alternative B. While the No Project/No Build Alternative would not introduce new hazardous materials to the site during construction or operations, it would also not remediate the hazardous materials currently on site. Overall, this alternative would have similar impacts associated with hazards and hazardous materials as Alternative A and Alternative B.

Energy Consumption

Both construction and operation of Alternative A and Alternative B would result in less-than-significant impacts associated with energy consumption. The No Project/No Build Alternative would result in no changes in energy consumption on the project site. No energy consumption associated with construction, vehicle trips, or on-site operation would occur. Impacts related to energy consumption would be less than significant under Alternative A and Alternative B, but because there would be no construction or new on-site sources under the No Project/No Build Alternative, impacts would be less severe than under Alternative A and Alternative B.

17.3.2 Alternative 1b: No Project/Existing Designations

This alternative assumes development would occur under the existing General Plan and Zoning designations for the project site. As discussed in Chapter 2, Project Description, all 26.8 acres of the project site are designated as Business Park in the General Plan and zoned Commercial Business Park. This zoning code requires the following setbacks: 20 feet from fronts of buildings to major streets, 40 feet from parking areas to major streets, 10 feet from fronts of buildings to local streets, 15 feet from parking areas to local streets, 30 feet from building sides to streets, and 10 feet from the rears of buildings to residential uses. Based on the required setbacks and area necessary for parking, roads, and other infrastructure, this alternative assumes approximately 200,000 square feet of development. The existing easement for Spring Hill Drive would be used to connect Idaho Maryland Road to Dorsey Drive. The area of disturbance within the project site would essentially be the same as Alternative A and Alternative B. Therefore, impacts would be similar.

Land Use

Alternative A and Alternative B would alter the planned land uses of the project site. Implementation of mitigation measures would ensure that these changes would result in less than significant impacts related to land use. The No Project/Existing Designations Alternative would develop the project site under the existing General Plan and Zoning designations. This alternative would result in office, limited manufacturing and some retail space, and could include up to 15 residential units per acre. With appropriate location of the land uses within the project site, such as placing the warehouse space near existing light industrial in the southern portion of the project site, the development would be generally consistent and compatible with adjacent land uses. Impacts would remain less than significant. Alternative A, Alternative B, and the No Project/Existing Designations Alternative would result in development of the currently vacant site, introducing new land uses adjacent to existing residences. The entire site would support Commercial Business Park uses, resulting in commercial and office uses, and potentially some residential use, being placed adjacent to existing businesses and residences. In contrast, Alternative A and Alternative B would place

residential and commercial retail land uses adjacent to most of the existing residences and businesses that surround the project site. The No Project/Existing Designations Alternative would have similar impacts related to land use as Alternative A and Alternative B.

Population and Housing

Alternative A and Alternative B would not result in any significant impacts associated with the provision of housing nor would the project induce substantial growth elsewhere in the City. The No Project/Existing Designations Alternative would support a similar mixed-use project, but would permit fewer residential units, and warehouse retail versus commercial retail space. A total of 90 multi-family units would be constructed under Alternative A and 172~~1~~ multi-family units would be constructed under Alternative B. These units would contribute to meeting the City's Regional Housing Needs as anticipated under the City's Housing Element. Under the existing zoning, up to 15 residential units per acre, or up to 400 residential units would be permitted on the 26.8 acres. However, given the Business Park designation in the General Plan and the Commercial Business Park zoning, it is expected that the majority of the site would be developed with office, some retail, and business park-type uses, with a limited amount of residential units. Under this alternative, impacts to population and housing would be similar to the impacts of Alternative A and Alternative B.

Biological Resources

Alternative A and Alternative B would result in potentially significant impacts to biological resources associated with the loss of protected trees and possible disturbance to special status plant species and nesting birds. With implementation of mitigation measures, these impacts would be reduced to less than significant levels. Under the No Project/Existing Designations Alternative, the project site would be cleared and graded, similar to Alternative A and Alternative B, and the development footprint would be the same. Thus it is anticipated that the loss protected trees and possible disturbance to special status plant species and nesting birds would be similar to Alternative A and Alternative B, requiring implementation of the same mitigation measures to reduce potential impacts to special status plant species and nesting birds to a less than significant level.

Overall, the No Project/Existing Designations Alternative would result in similar impacts to biological resources as Alternative A and Alternative B. All impacts under either Alternative A, Alternative B, or this alternative would be reduced to less-than-significant levels with implementation of mitigation measures.

Cultural Resources

Alternative A and Alternative B would result in potentially significant impacts associated with disturbance of archaeological resources. While the potential for disturbance to unknown subsurface

prehistoric or historic resources and human remains is considered low, mitigation is included that would reduce potential impacts to a less than significant level.

Development under the No Project/Existing Designations Alternative would result in a similar area of disturbance as well as potential disturbance to archaeological resources as Alternative A and Alternative B because the same grading and earthmoving activities could potentially disturb unknown subsurface resources. Thus impacts to cultural resources would be the same under the No Project/Existing Designations Alternative and Alternative A and Alternative B.

Visual Resources

Alternative A and Alternative B would result in potentially significant impacts to visual resources associated with loss of trees and changes in the visual character of the project site. Mitigation measures are identified to reduce these impacts to less than significant levels by identifying performance standards for project site landscaping to ensure that effective visual screening of the proposed development is provided.

The No Project/Existing Designations Alternative would result in the same alteration of the visual conditions at the project site as Alternative A and Alternative B by developing commercial, warehouse, and possibly a limited amount of residential land uses, replacing nearly all of the existing vegetation on site with new buildings. With implementation of the same mitigation measures as required for Alternative A and Alternative B, the No Project/Existing Designations Alternative would result in similar impacts to visual resources.

Transportation and Circulation

Alternative A would increase traffic in the project vicinity due to the introduction of commercial and residential land uses to the currently vacant project site. Implementation of mitigation measures would be necessary to ensure that most impacts to traffic and circulation in the vicinity are reduced to less than significant levels, however one impact would remain significant and unavoidable due to the length of vehicle queues at the Dorsey Drive/SR 20/49 interchange in the cumulative plus project scenario. Alternative B would generate less traffic than Alternative A, but would also increase traffic in the project vicinity and require implementation of mitigation measures requiring the project applicant to provide a fair-share contribution to installation of traffic signals at a few intersections. Traffic impacts under Alternative B would all be reduced to less than significant levels with implementation of mitigation.

The No Project/Existing Designations Alternative would introduce a similar level of development to the project site, supporting development of Corporate Business Park land uses, which would include warehouses, commercial and office uses, and limited residential uses. It is expected that the traffic generation associated with a Corporate Business Park would be less than

the traffic generation of either Alternative A or Alternative B because the retail and residential uses anticipated under those alternative have higher trip generation rates than warehouse and office uses. Thus the No Project/Existing Designations Alternative would have reduced transportation impacts compared to Alternative A and Alternative B.

Noise

Alternative A and Alternative B would result in potentially significant impacts associated with noise generated during project construction and operation. Mitigation measures are identified to ensure that noise exposure for residents of the project site and existing residents on adjacent parcels remain within the acceptable noise level range as established by the City of Grass Valley. The No Project/Existing Designations Alternative would result in development of a similar project, including similar amounts of noise generation from construction and increases in noise generated from the proposed land uses. Therefore, the No Project/Existing Designations Alternative, assuming incorporating the same types of mitigation measures, would have similar noise impacts as Alternative A and Alternative B.

Air Quality

Alternative A and Alternative B would result in less than significant air quality impacts during project construction and during project operation. Implementation of mitigation measures would reduce the air pollutant emissions to less than significant levels. Under the No Project/Existing Designations Alternative, the level of construction activity on the site would be similar to Alternative A and Alternative B and would be expected to result in similar impacts. Operation of the No Project//Existing Designations Alternative would generate less vehicle trips which would reduce the air pollution emissions associated with the project. Thus impacts to air quality would be less under the No Project//Existing Designations Alternative compared to Alternative A and Alternative B.

Climate Change

Alternative A and Alternative B would result in significant and unavoidable impacts related to GHG emissions during project operation. Implementation of mitigation measures would reduce the GHG emissions, but emissions would remain significant and unavoidable. Under the No Project/Existing Designations Alternative, construction emissions would be similar to those under Alternative A and Alternative B, while operational emissions would be reduced commensurate with the reduction in traffic volumes associated with the No Project/Existing Designations Alternative. The impact associated with GHGs emissions would be reduced under this alternative, but would be expected to remain significant and unavoidable.

Geology, Soils, Seismicity, and Paleontology

Alternative A and Alternative B would not expose future residents to risks due to earthquakes or unstable soils and impacts would be less than significant. Compliance with existing state and local regulations would ensure that substantial erosion or loss of topsoil would be less than significant. There is low potential for the site to support paleontological resources, disturbance of which would be a potentially significant impact. Mitigation is identified to reduce this impact to less than significant.

Because the No Project/Existing Designations Alternative would involve the same site remediation and area of disturbance for construction, this alternative would result in the same impacts related to geology, soils, seismicity, and paleontology as Alternative A and Alternative B.

Hydrology and Water Quality

Alternative A and Alternative B would incorporate BMPs and meet NPDES permit requirements, and thus would not result in any significant impacts to groundwater supply, increases in stormwater flows that could exceed capacity of stormwater infrastructure, or increases in sediment and erosion on local waterways during construction. All of these impacts were determined to be less than significant.

The No Project/Existing Designations Alternative would develop a project with Corporate Business Park land uses and would involve construction in the same area of disturbance as Alternative A and Alternative B. The No Project/Existing Designations Alternative would result in a similar amount of impervious surface within the project site. BMPs and other mitigation measures to address such impacts would be similar to those for Alternative A – for example, the alternative would likely also use vegetated swales and detention basins to control stormwater runoff. Therefore, the No Project/Existing Designations Alternative would have similar impacts to hydrology and water quality related to an increase in stormwater, loss of groundwater, or inadequate stormwater infrastructure it would meet the same performance standards for stormwater management as Alternative A and Alternative B.

Public Services and Utilities

Alternative A and Alternative B would have less than significant impacts related to existing public services including police, fire, solid waste disposal, emergency access, parks, libraries, schools, and dry utilities. Alternative A and Alternative B would increase demand for these services and utilities but the demand would be consistent with the levels anticipated by the applicable service providers and impacts would remain less than significant.

The No Project/Existing Designations Alternative would support a similar mixed-use development consisting of warehouse retail, business park, office, and some residential land uses. The existing

zoning allows for up to 8 residential units per acre; therefore, this alternative could generate more than 200 residential units while Alternative A includes 90 units and Alternative B includes 1721 units. However, given the business park land use, it is likely that the existing designations alternative would generate a smaller population increase than Alternative A or Alternative B. The alternative would still require public services and utilities but would likely at a lower demand for services compared to Alternative A. Therefore, the No Project/Existing Designations Alternative would have similar or reduced public services and utilities impacts compared to Alternative A and Alternative B.

Hazards and Hazardous Materials

Alternative A and Alternative B would result in less than significant impacts related to the use, transport, or handling of hazards and hazardous materials during project construction and operation. Impacts related to hazards and hazardous materials would be less than significant under Alternative A and Alternative B. The No Project/Existing Designations Alternative would involve the same site remediation activities as either Alternative A or Alternative B and would result in similar less-than-significant impacts related to hazards and hazardous materials.

Energy Consumption

Both construction and operation of Alternative A and Alternative B would result in less-than-significant impacts associated with energy consumption. The No Project/Existing Designations would result in similar impacts to energy consumption on the project site. Energy efficiency (meaning the amount of energy used per square foot of building space or per dwelling unit) under the No Project/Existing Designations Alternative would be similar to Alternative A and Alternative B. Traffic generation would be reduced under the No Project/Existing Designations Alternative, which would reduce the total amount of energy consumed, however it would not change the energy efficiency of the vehicle traffic associated with the project. Therefore, impacts related to energy consumption associated with the No Project/Existing Designations Alternative would be similar to those of Alternative A and Alternative B.

17.3.3 Alternative 2: Reduced Development

This alternative would reduce the amount of development relative to the originally proposed project, Alternative A. It would reduce commercial development by about 15% and residential development by 50% in an effort to reduce impacts associated with the extent of the area of disturbance within the project site. This would result in 153,000 square feet of commercial development and 45 multi-family residential units.

The Reduced Development Alternative assumes a reduced development footprint to avoid grading and developing on the hilltop and to increase retention of existing ponderosa pines and McNabb cypress. The extension of Spring Hill Drive through the project site would occur in the same

alignment as proposed under Alternative A and Alternative B. This alternative would still require a General Plan Amendment to change the land use designation on the site from Business Park to Commercial and Residential Urban High Density and a rezone from Corporate Business Park to Commercial (C-2) and Multiple Dwelling Residential (R-3), as in Alternative A.

Land Use

Alternative A and Alternative B would alter the planned land uses of the project site. These changes would result in less than significant impacts related to land use and would not require implementation of mitigation measures.

The Reduced Development Alternative would develop a similar project, with reduced densities across the site, resulting in fewer residential units and less commercial space. The development would be generally consistent and compatible with adjacent land uses. Impacts would remain less than significant and would be similar to those of Alternative A and Alternative B.

Population and Housing

Alternative A and Alternative B would not result in any significant impacts associated with the provision of housing nor would the project induce substantial growth elsewhere in the City.

The Reduced Development Alternative would develop a similar project, with reduced densities across the site, resulting in a lower residential population for the site. Alternative A would support approximately 184 residents, Alternative B would support approximately 349 residents, and the Reduced Development Alternative would support approximately 92 residents. This level of population growth is consistent with the City of Grass Valley General Plan growth projections and impacts would remain less than significant. This alternative would have a similar but reduced ability as Alternative A and Alternative B to contribute to achievement of the City's Housing Element goals. Thus the Reduced Development Alternative would result in similar impacts related to population and housing as Alternative A and Alternative B.

Biological Resources

Alternative A and Alternative B would result in potentially significant impacts to biological resources associated with the loss of protected trees and possible disturbance to special status plant species and nesting birds. With implementation of mitigation measures, these impacts would be reduced to less than significant levels. Under the Reduced Development Alternative, only part of the project site would be developed. It is expected that approximately 18 acres of the site would be developed with commercial uses and associated parking and approximately 3 acres of the site would be developed with residential uses and associated parking. This would allow for an increase in the amount of open space and retention of natural habitat, including allowing for preservation

of a portion of the ponderosa pine forest on top of the knoll near the center of the site and a portion of the McNabb cypress woodland in the northeastern and southeastern corners of the site. Thus it is anticipated that the loss of sensitive natural communities, loss of protected trees and possible disturbance to special status plant species and nesting birds would be reduced compared to Alternative A and Alternative B.

Cultural Resources

Alternative A and Alternative B would result in potentially significant impacts associated with disturbance of archaeological resources. While the potential for disturbance to unknown subsurface prehistoric or historic resources and human remains is considered low, mitigation is included that would reduce potential impacts to a less than significant level.

Development under the Reduced Development Alternative would result in a smaller area of disturbance as well as potential disturbance to archaeological resources than Alternative A because this alternative would entail less grading and earthmoving activities that could potentially disturb unknown subsurface resources. Because some grading and earthwork still exists, there is still a potential for disturbance. Mitigation measures would ensure the proper protocols are followed in the event any resources were found under Alternative A, Alternative B, or the Reduced Density Alternative thus the potential impacts of the Reduced Density Alternative would be similar to those of Alternative A and Alternative B.

Visual Resources

Alternative A and Alternative B would result in potentially significant impacts to visual resources associated with loss of trees and changes in the visual character of the project site. Mitigation measures are identified to reduce these impacts to less than significant levels by identifying performance standards for project site landscaping to ensure that effective visual screening of the proposed development is provided.

The Reduced Development Alternative would also result in alteration of the visual conditions at the project site by a mixture of residential, commercial, and office uses. However, a portion of the ponderosa pine forest on top of the knoll near the center of the site and a portion of the McNabb cypress woodland in the northeastern and southeastern corners of the site would be retained. Under the Reduced Development Alternative, impacts to aesthetics would be reduced compared to Alternative A and Alternative B because less of the site would be developed and more trees would remain on site and visible from off-site locations.

Transportation and Circulation

Alternative A and Alternative B would increase traffic in the project vicinity due to the introduction of commercial, residential, and office (in Alternative B only) land uses to the currently vacant project site. Implementation of mitigation measures would be necessary to reduce impacts to traffic and circulation in the vicinity. Alternative A would result in one significant and unavoidable impact due to the length of vehicle queues at the Dorsey Drive/SR 20/49 interchange in the cumulative plus project scenario. Alternative B would generate less traffic than Alternative A, but would also increase traffic in the project vicinity and require implementation of mitigation measures requiring the project applicant to provide a fair-share contribution to installation of traffic signals at a few intersections. Traffic impacts under Alternative B would all be reduced to less than significant levels with implementation of mitigation.

The Reduced Development Alternative would introduce a lower level of development to the project site. While this alternative would contribute traffic to the existing transportation and circulation network in the project vicinity, the increase in traffic volumes would be reduced. Therefore, this alternative would result in reduced impacts compared to Alternative A and Alternative B.

Noise

Alternative A and Alternative B would result in potentially significant impacts associated with noise generated during project construction and operation. Mitigation measures are identified to ensure that noise exposure for residents of the project site and existing residents on adjacent parcels remain within the acceptable noise level range as established by the City of Grass Valley. The Reduced Development Alternative would result in development of a similar but smaller scale project. Due to fewer residential units and less commercial and office space, this alternative is anticipated to require less construction than Alternative A and Alternative B, resulting in reduced noise generation from construction and the proposed land uses as well as from traffic. Therefore, the Reduced Development Alternative would have similar but reduced noise impacts compared to Alternative A and Alternative B.

Air Quality

Alternative A and Alternative B would result in potentially significant air quality impacts during project construction and less than significant impacts during project operation. Implementation of mitigation measures would reduce the air pollutant emissions during construction to a less than significant impact. The Reduced Development Alternative would require less development on site and would generate less traffic than Alternative A and Alternative B. The Reduced Development Alternative is expected to result in reduced air pollutant emissions during project construction and operation compared to Alternative A and Alternative B.

Climate Change

Alternative A and Alternative B would result in significant and unavoidable impacts related to GHG emissions during project operation. Implementation of mitigation measures would reduce the GHG emissions, but emissions would remain significant and unavoidable. The Reduced Development Alternative would involve less construction intensity and operational emissions than Alternative A and Alternative B. While the total GHG emissions during construction would be reduced, it is expected that some construction phases would continue to result in significant GHG emissions. The Reduced Development Alternative would reduce those emissions by approximately 10%; however, the emissions would continue to exceed the recommended threshold of 1,100 metric tons CO_2E annually and the impact would remain significant and unavoidable.

Geology, Soils, Seismicity, and Paleontology

Alternative A and Alternative B would not expose future residents to risks due to earthquakes or unstable soils and impacts would be less than significant. Compliance with existing state and local regulations would ensure that substantial erosion or loss of topsoil would be less than significant. There is low potential for the site to support paleontological resources, disturbance of which would be a potentially significant impact. Mitigation is identified to reduce this impact to less than significant.

The Reduced Development Alternative would involve the same site remediation activities as Alternative A and Alternative B but would disturb slightly less of the project site. Similar to Alternative A and Alternative B, there would be no significant impacts associated with risks to the public due to earthquakes or unstable soils and there would be no impacts to paleontological resources. Compliance with existing requirements would mitigate for potential impacts associated with construction-related erosion. Impacts of the Reduced Development Alternative associated with geology, soils, seismicity, and paleontology would be similar to the impacts of Alternative A and Alternative B.

Hydrology and Water Quality

Alternative A and Alternative B would incorporate BMPs and meet NPDES permit requirements, and thus not result in any significant impacts to groundwater supply, increases in stormwater flows that could exceed capacity of stormwater infrastructure, or increases in sediment and erosion on local waterways during construction. All of these impacts were determined to be less than significant.

The Reduced Development Alternative would develop a mixed-use project similar to Alternative A and Alternative B but would involve construction in a slightly smaller area of disturbance. This alternative would have similar but reduced impacts to hydrology and water quality related to an increase in stormwater, loss of groundwater, adequacy of stormwater infrastructure, and flood hazards because development would occur in generally similar areas and there would be a similar

(although smaller) increase in impervious surfaces under this alternative as under Alternative A. Therefore, impacts would be similar to Alternative A and Alternative B.

Public Services and Utilities

Alternative A and Alternative B would have less than significant impacts related to existing public services including police, fire, solid waste disposal, emergency access, libraries, schools, and dry utilities. Alternative A and Alternative B would increase demand for these services and utilities but the demand would be consistent with the levels anticipated by the applicable service providers and impacts would remain less than significant. The Reduced Development Alternative would develop a similar mixed-use project, although there would be fewer residential units and less commercial and office space. This alternative would generate a smaller population increase than Alternative A and Alternative B. This alternative would still require public services and utilities but would have a slightly lower demand for services compared to Alternative A and Alternative B. Therefore, the Reduced Development Alternative would have slightly reduced public services and utilities impacts.

Hazards and Hazardous Materials

Alternative A and Alternative B would result in less than significant impacts related to the use, transport, or handling of hazards and hazardous materials during project construction and operation. Impacts related to hazards and hazardous materials would be less than significant under Alternative A and Alternative B. The same site remediation required for Alternative A and Alternative B would occur under the Reduced Development Alternative. This alternative would result in similar less-than-significant impacts related to hazards and hazardous materials as Alternative A and Alternative B.

Energy Consumption

Construction and operation of Alternative A would result in less-than-significant impacts associated with energy consumption. Because the Reduced Development Alternative would entail less development than Alternative A and Alternative B, it would result in a reduced total amount of energy consumption, but it would have relatively the same energy efficiency. Thus impacts related to energy consumption would be similar and would remain less than significant under Alternative A and Alternative B.

17.3.4 Alternative 3: Vertical Mixed Use

The alternative entails a vertical mixed use development. This allows for a reduced project footprint which accommodates greater preservation of existing resources within the project site. The development would reduce the amount of commercial development by about 25% and

increase residential development by about 20% compared to Alternative A, resulting in 135,000 square feet of commercial space and 108 multi-family residential units. It is expected that this would involve development on approximately 18 acres of the 26.8-acre project site. Most buildings would be two or three stories tall with commercial uses on the ground floor and residential units on the second and third stories, similar to the mixed office-residential building proposed under Alternative B. Some buildings would be a single story and would support only commercial uses.

By reducing the overall development footprint, the Vertical Mixed-Use Alternative would accommodate retaining a portion of the ponderosa pine forest on top of the knoll near the center of the site and a portion of the McNabb cypress woodland in the northeastern and southeastern corners of the site. The extension of Spring Hill Drive through the project site would occur in the same alignment as proposed under Alternative A and Alternative B. This alternative would still require a General Plan Amendment to change the land use designation on the site from Business Park to Commercial and a rezone from Corporate Business Park to Commercial (C-2) or Neighborhood Commercial.

The residential units would include balconies and would not exceed a maximum density of 15 residential units per acre. Upper floors may also be occupied by office uses. Per the City's Development Code, C-2 zoning allows a maximum height of 50 feet or four stories, requires no front setbacks and a rear 25-foot setback abutting existing residential uses, and there is no maximum site coverage. Businesses such as restaurants, markets, pharmacies, banks, and office are permitted. A Use Permit would be required for drive-through facilities, a single tenant floor area of over 10,000 square feet, and any commercial component that would operate outside of the hours from 8:00 a.m. to 6:00 p.m. (per 17.44.140 of the Development Code).

Land Use

Alternative A and Alternative B would alter the planned land uses of the project site. These changes would result in less than significant impacts related to land use and would not require implementation of mitigation measures.

The Vertical Mixed-Use Alternative would develop a similar project, but with a smaller footprint. Compared to Alternative A it would have more residential units and less commercial space; compared to Alternative B it would have fewer residential units and more commercial space. Similar to both Alternative A and Alternative B, the Vertical Mixed Use Alternative would be generally consistent and compatible with adjacent land uses. The land use impacts of the Vertical Mixed Use Alternative would be similar to the impacts of Alternative A and Alternative B.

Population and Housing

Alternative A and Alternative B would not result in any significant impacts associated with the provision of housing nor would the project induce substantial growth elsewhere in the City. The Vertical Mixed-Use Alternative would develop a similar project. Under Alternative A, the site would support approximately 184 residents, under Alternative B it would support 349 residents, and under the Vertical Mixed-Use Alternative the site would support approximately 220 residents. This level of population growth is consistent with the City of Grass Valley General Plan growth projections and impacts would remain less than significant. The Vertical Mixed-Use Alternative would include 108 multi-family dwelling units, which would contribute to achievement of the City's Housing Element goals slightly more than Alternative A and somewhat less than Alternative B. The Vertical Mixed-Use Alternative would result in similar impacts related to population and housing as Alternative A and Alternative B.

Biological Resources

Alternative A and Alternative B would result in potentially significant impacts to biological resources associated with the loss of protected trees and possible disturbance to special status plant species and nesting birds. With implementation of mitigation measures, these impacts would be reduced to less than significant levels. Under the Vertical Mixed-Use Alternative, it is expected that 18 acres of the project site would be developed, leaving 8.7 acres of open space. This would allow for preservation of a portion of the ponderosa pine forest on top of the knoll near the center of the site and a portion of the McNab cypress woodland in the northeastern and southeastern corners of the site. Thus it is anticipated that the loss of sensitive natural communities, loss of protected trees and possible disturbance to special status plant species and nesting birds would be reduced compared to Alternative A and Alternative B and the impacts to biological resource from the Vertical Mixed-Use Alternative would be less than those of Alternative A and Alternative B.

Cultural Resources

Alternative A and Alternative B would result in potentially significant impacts associated with disturbance of archaeological resources. While the potential for disturbance to unknown subsurface prehistoric or historic resources and human remains is considered low, mitigation is included that would reduce potential impacts to a less than significant level.

Development under the Vertical Mixed-Use Alternative would result in a smaller area of disturbance as well as potential disturbance to archaeological resources than Alternative A and Alternative B because this alternative would entail less grading and earthmoving activities that could potentially disturb unknown subsurface resources. Because site remediation, grading and earthwork would be needed, there is still a potential for disturbance. Mitigation measures would ensure the proper protocols are followed in the event any resources were found under Alternative

A, Alternative B, or the Vertical Mixed-Use Alternative thus the potential impacts of the Vertical Mixed-Use Alternative would be similar to those of Alternative A and Alternative B.

Visual Resources

Alternative A and Alternative B would result in potentially significant impacts to visual resources associated with loss of trees and changes in the visual character of the project site. Mitigation measures are identified to reduce these impacts to less than significant levels by identifying performance standards for project site landscaping to ensure that effective visual screening of the proposed development is provided.

The Vertical Mixed-Use Alternative would also result in alteration of the visual conditions at the project site by a mixture of residential, commercial, and office uses. The two- and three-story mixed use buildings would be similar heights and massing as the heights and massing of buildings under Alternative A and Alternative B. Further, as discussed in the Noise section for this alternative, it is possible that a noise attenuation barrier would be needed along the western project site boundary. This could result in an increase in visual impacts because visual screening would be more difficult to accomplish for a solid wall compared to a series of buildings. However, a portion of the ponderosa pine forest on top of the knoll near the center of the site and a portion of the McNab Cypress woodland in the northeastern and southeastern corners of the site would be retained. Overall, impacts to aesthetics under the Vertical Mixed-Use Alternative would be similar to those of Alternative A and Alternative B because less of the site would be developed and more trees would remain on site and visible from off-site locations but more of the built features may be visible from viewpoints to the west of the project site.

Transportation and Circulation

Alternative A would increase traffic in the project vicinity due to the introduction of commercial and residential land uses to the currently vacant project site. Implementation of mitigation measures would be necessary to reduce impacts to traffic and circulation in the vicinity, however one significant and unavoidable impact would remain due to the length of vehicle queues at the Dorsey Drive/SR 20/49 interchange. Alternative B would generate less traffic than Alternative A, but would also increase traffic in the project vicinity and require implementation of mitigation measures requiring the project applicant to provide a fair-share contribution to installation of traffic signals at a few intersections. All traffic impacts under Alternative B would be reduced to less-than-significant levels with implementation of mitigation.

The Vertical Mixed-Use Alternative would introduce a similar level of development to the project site. It would have more residential space and less commercial space than Alternative A, and would have less residential space and more commercial space than Alternative B. While this alternative would contribute traffic to the existing transportation and circulation network in the

project vicinity, the increase in PM peak hour traffic volumes would be reduced compared to Alternative A; commercial uses tend to generate higher PM peak hour traffic volumes than residential uses due to people shopping for goods and services during their evening commute. Similarly, the Vertical Mixed-Use Alternative would be expected to have slightly higher PM peak hour traffic volumes than Alternative B. With implementation of mitigation measures requiring the project applicant to contribute a fair share of funding towards necessary roadway improvements, it is expected that the traffic impacts of the Vertical Mixed-Use Alternative would be reduced to a less-than-significant level, thus impacts of the Vertical Mixed-Use Alternative would be similar to those of Alternative A and Alternative B.

Noise

Alternative A and Alternative B would result in potentially significant impacts associated with noise generated during project construction and operation. Mitigation measures are identified to ensure that noise exposure for residents of the project site and existing residents on adjacent parcels remain within the acceptable noise level range as established by the City of Grass Valley. The Vertical Mixed-Use Alternative would result in development of a similar development and would require similar amount of construction. With preservation of a portion of the ponderosa forest on the knoll near the center of the site and the McNab cypress woodland in the northeastern and southeastern corners of the site, construction and operational activities would generally occur further from existing residents than under Alternative A and Alternative B. Thus there would be a reduced potential for noise impacts to existing residents. However, this alternative would place more residential units closer to SR 20/49 than is proposed under Alternative A or Alternative B. Those units could be exposed to unacceptable noise levels, which could be mitigated with the construction of noise attenuation barriers. Therefore, the Vertical Mixed-Use Alternative would have similar noise impacts compared to Alternative A and Alternative B.

Air Quality

Alternative A and Alternative B would result in potentially significant air quality impacts during project construction and less than significant impacts during project operation. Implementation of mitigation measures would reduce the air pollutant emissions to a less than significant level. The Vertical Mixed-Use Alternative would require slightly less development on site than Alternative A and slightly more than Alternative B. Thus the Vertical Mixed-Use Alternative is expected to result in reduced air pollutant emissions during project operation compared to Alternative A and increase air pollutant emissions compared to Alternative B. However, impacts would be similar.

Climate Change

Alternative A and Alternative B would result in significant and unavoidable impacts related to GHG emissions during project operation. Implementation of mitigation measures would reduce the GHG

emissions, but emissions would remain significant and unavoidable. The Vertical Mixed-Use Alternative would involve less operational emissions than Alternative A but more operational emissions than Alternative B. It is expected that emissions would continue to exceed the recommended threshold of 1,100 metric tons CO_2E annually and the impact would remain significant and unavoidable.

Geology, Soils, Seismicity, and Paleontology

Alternative A and Alternative B would not expose future residents to risks due to earthquakes or unstable soils and impacts would be less than significant. Compliance with existing state and local regulations would ensure that substantial erosion or loss of topsoil would be less than significant. There is low potential for the site to support paleontological resources, disturbance of which would be a potentially significant impact. Mitigation is identified to reduce this impact to less than significant.

The Vertical Mixed-Use Alternative would involve the same site remediation activities as Alternative A and Alternative B but would disturb slightly less of the project site. Similar to Alternative A and Alternative B, there would be no significant impacts associated with risks to the public due to earthquakes or unstable soils and there would be no impacts to paleontological resources. Compliance with existing requirements would mitigate for potential impacts associated with construction-related erosion. Impacts of the Vertical Mixed-Use Alternative associated with geology, soils, seismicity, and paleontology would be similar to the impacts of Alternative A and Alternative B.

Hydrology and Water Quality

Alternative A and Alternative B would incorporate BMPs and meet NPDES permit requirements, and thus not result in any significant impacts to groundwater supply, increases in stormwater flows that could exceed capacity of stormwater infrastructure, or increases in sediment and erosion on local waterways during construction. All of these impacts were determined to be less than significant.

The Vertical Mixed-Use Alternative would develop a mixed-use project similar to Alternative A and Alternative B but with a smaller area of disturbance and would create less impervious surfaces than either Alternative A or Alternative B. Therefore, it would entail fewer impacts to hydrology and water quality related to an increase in stormwater, loss of groundwater, and adequacy of stormwater infrastructure. Therefore, impacts would be similar to but less than Alternative A and Alternative B.

Public Services and Utilities

Alternative A and Alternative B would have less than significant impacts related to existing public services including police, fire, solid waste disposal, emergency access, libraries, schools, and dry utilities. Alternative A and Alternative B would increase demand for these services and utilities but the demand would be consistent with the levels anticipated by the applicable service providers and impacts would remain less than significant.

The Vertical Mixed-Use Alternative would develop a similar mixed-use project, although it would entail slightly more residential units and less commercial retail space than Alternative A and somewhat less residential units and more commercial space than Alternative B. This alternative would therefore result in a similar overall demand for services and similar impacts to public services and utilities as compared to Alternative A and Alternative B.

Hazards and Hazardous Materials

Alternative A and Alternative B would result in less than significant impacts related to the use, transport, or handling of hazards and hazardous materials during project construction and operation. Impacts related to hazards and hazardous materials would be less than significant under Alternative A and Alternative B. The same site remediation required for Alternative A and Alternative B would occur under the Vertical Mixed-Use Alternative. This alternative would result in similar less-than-significant impacts related to hazards and hazardous materials as Alternative A and Alternative B.

Energy Consumption

Construction and operation of Alternative A and Alternative B would result in less-than-significant impacts associated with energy consumption. Because the Vertical Mixed-Use Alternative would entail a smaller construction footprint than Alternative A, it would result in similar but reduced construction-related impacts to energy consumption as Alternative A and Alternative B. This alternative would consume slightly less energy than Alternative A because it would entail slightly more residential units and slightly less commercial retail space, which would reduce the amount of vehicle trips and on-site electrical consumption at the project site. This alternative would consume approximately the same amount of energy as Alternative B because it would involve fewer residential units but more commercial space. However, energy efficiency of the buildings constructed on site would be the same as Alternative A and Alternative B, thus impacts related to energy consumption would be similar and would remain less than significant.

17.3.5 Alternative 4: Tiered Alternative

This Alternative would create a tiered project site, featuring three tiers separated by sloped grades to more closely match the natural grade of the site. It would develop 138,700 square feet of commercial retail space and 90 multi-family apartments. Smaller shops would be located on the northern and eastern portions, a larger anchor store would be developed on the southwestern side, and apartments would be developed on the southeastern portion. This alternative would preserve the hilltop from grading and development. Most of the existing easement for Spring Hill Drive would be used to connect Idaho Maryland Road to Dorsey Drive, but the connection to Dorsey Drive would be moved slightly west, as in Alternative A and Alternative B. This alternative would still require a General Plan Amendment to change the land use designation on the site from Business Park to Commercial and Residential Urban High Density and a rezone from Corporate Business Park to Commercial (C-2) and Multiple Dwelling Residential (R-3).

Land Use

Alternative A and Alternative B would alter the planned land uses of the project site. These changes would result in less than significant impacts related to land use and would not require implementation of mitigation measures.

The Tiered Alternative would develop a similar project, but with a smaller footprint and less commercial space. The development would be generally consistent and compatible with adjacent land uses. Impacts would remain less than significant and would be similar to those of Alternative A and Alternative B.

Population and Housing

Alternative A and Alternative B would not result in any significant impacts associated with the provision of housing nor would the project induce substantial growth elsewhere in the City.

The Tiered Alternative would develop a similar project, with the same residential component as Alternative A and fewer residential units than Alternative B. Alternative A and the Tiered Alternative would support approximately 184 residents, while Alternative B would support 349 residents. This level of population growth is consistent with the City of Grass Valley General Plan growth projections and impacts would remain less than significant. The Tiered Alternative would include up to 90 multi-family dwelling units, consistent with Alternative A. Thus this alternative would have a similar ability as Alternative A to contribute to achievement of the City's Housing Element goals but would have a reduced ability to contribute to achievement of the City's Housing Element goals compared to Alternative B.

Biological Resources

Alternative A and Alternative B would result in potentially significant impacts to biological resources associated with the loss of protected trees and possible disturbance to special status plant species and nesting birds. With implementation of mitigation measures, these impacts would be reduced to less than significant levels. Under the Tiered Alternative, only part of the project site would be developed. This would allow for an increase in the amount of open space and natural habitat retained, such as preservation of the hilltop and more of the Ponderosa pines, although loss of some trees would still occur. The Tiered Alternative would not allow for preservation of the McNab cypress woodland within the project site, similar to both Alternative A and Alternative B. It is anticipated that the loss of protected trees and possible disturbance to special status plant species and nesting birds would be reduced compared to Alternative A and Alternative B. Mitigation would still be implemented to reduce potential impacts to special status plant species and nesting birds to a less than significant level, as under Alternative A and Alternative B.

Overall, the Tiered Alternative would result in reduced impacts to biological resources compared to Alternative A and Alternative B. All impacts to biological resources under either Alternative A or this alternative would be reduced to less than significant with implementation of mitigation measures.

Cultural Resources

Alternative A and Alternative B would result in potentially significant impacts associated with disturbance of archaeological resources. While the potential for disturbance to unknown subsurface prehistoric or historic resources and human remains is considered low, mitigation is included that would reduce potential impacts to a less than significant level.

Development under the Tiered Alternative would result in a slightly smaller area of disturbance as well as potential disturbance to archaeological resources than Alternative A and Alternative B because this alternative would entail less grading and earthmoving activities that could potentially disturb unknown subsurface resources. Because site remediation, grading and earthwork would be needed, there is still a potential for disturbance. Mitigation measures would ensure the proper protocols are followed in the event any resources were found under Alternative A, Alternative B, or the Tiered Alternative thus the potential impacts of the Tiered Alternative would be similar to those of Alternative A and Alternative B.

Visual Resources

Alternative A and Alternative B would result in potentially significant impacts to visual resources associated with loss of trees and changes in the visual character of the project site. Mitigation measures are identified to reduce these impacts to less than significant levels by identifying performance standards for project site landscaping to ensure that effective visual screening of the proposed development is provided.

The Tiered Alternative would also result in alteration of the visual conditions at the project site by developing a mixture of residential, commercial retail, and office uses. The two- and three-story mixed use buildings would be similar heights and massing as the heights and massing of buildings under Alternative A and Alternative B. However, a portion of the ponderosa pine forest on top of the knoll near the center of the site would be retained. Additionally, the slopes in between the development tiers would offer more opportunities for landscaping and tree planting that would be visible from many of the key viewpoints and could help the site blend in more with the existing environment. Under the Tiered Alternative, impacts to aesthetics would be reduced compared to Alternative A and Alternative B because less of the site would be developed and more ponderosa pines would be retained.

Transportation and Circulation

Alternative A would increase traffic in the project vicinity due to the introduction of commercial and residential land uses to the currently vacant project site. Implementation of mitigation measures would reduce impacts to traffic and circulation in the vicinity, however a significant and unavoidable impact would remain under Alternative A due to the lengths of vehicle queues at the Dorsey Drive/SR 20/49 interchange. Alternative B would generate less traffic than Alternative A, but would also increase traffic in the project vicinity and require implementation of mitigation measures requiring the project applicant to provide a fair-share contribution to installation of traffic signals at a few intersections. All impacts under Alternative B would be reduced to less than significant levels.

The Tiered Alternative would introduce a similar level of development to the project site, with the same residential component but less commercial space than Alternative A and with less residential development and more commercial development than Alternative B. While this alternative would contribute traffic to the existing transportation and circulation network in the project vicinity, the increase in PM peak hour traffic volumes would be reduced compared to Alternative A because the amount of commercial space would be reduced. Similarly, the Tiered Alternative would be expected to have slightly higher PM peak hour traffic volumes than Alternative B. With implementation of mitigation measures requiring the project applicant to contribute a fair share of funding towards necessary roadway improvements, it is expected that the traffic impacts of the Tiered Alternative would be reduced to a less-than-significant level, thus impacts of the Tiered Alternative would be less than those of Alternative A and similar to those of Alternative B.

Noise

Alternative A would result in less-than-significant impacts associated with noise generated during project construction and operation. The Tiered Alternative would result in development of a similar project. Due to a smaller footprint and less grading and fill, this alternative is

anticipated to require a shorter construction timeframe than Alternative A, resulting in reduced noise generation from construction and the proposed land uses as well as from traffic. Additionally, slightly less commercial land uses would be expected to slightly decrease operational noise. Therefore, the Tiered Alternative would have similar but reduced noise impacts compared to Alternative A.

Alternative A and Alternative B would result in potentially significant impacts associated with noise generated during project construction and operation. Mitigation measures are identified to ensure that noise exposure for residents of the project site and existing residents on adjacent parcels remain within the acceptable noise level range as established by the City of Grass Valley. The Tiered Alternative would result in development of a similar development and would require similar amount of construction. With preservation of a portion of the ponderosa forest on the knoll near the center of the site, construction and operational activities would generally occur further from existing residents than under Alternative A and Alternative B. Thus there would be a reduced potential for noise impacts to existing residents. Therefore, the Tiered Alternative would have similar but slightly reduced noise impacts compared to Alternative A and Alternative B.

Air Quality

Alternative A and Alternative B would result in potentially significant air quality impacts during project construction and less than significant impacts during project operation. Implementation of mitigation measures would reduce the air pollutant emissions to a less than significant level. The Tiered Alternative would require slightly less development on site than Alternative A and slightly more than Alternative B, and would generate less traffic than Alternative A but more traffic than Alternative B. Thus the Tiered Alternative is expected to result in reduced air pollutant emissions during project operation compared to Alternative A and increased air pollutant emissions compared to Alternative B. However, impacts would be similar and would remain less than significant.

Climate Change

Alternative A and Alternative B would result in significant and unavoidable impacts related to GHG emissions during project operation. Implementation of mitigation measures would reduce the GHG emissions, but emissions would remain significant and unavoidable. The Tiered Alternative would involve less operational emissions than Alternative A but more operational emissions than Alternative B. Emissions would continue to exceed the recommended threshold of 1,100 metric tons CO_2E annually and the impact would remain significant and unavoidable.

Geology, Soils, Seismicity, and Paleontology

Alternative A and Alternative B would not expose future residents to risks due to earthquakes or unstable soils and impacts would be less than significant. Compliance with existing state

and local regulations would ensure that substantial erosion or loss of topsoil would be less than significant. There is low potential for the site to support paleontological resources, disturbance of which would be a potentially significant impact. Mitigation is identified to reduce this impact to less than significant.

The Tiered Alternative would involve the same site remediation activities as Alternative A and Alternative B but would disturb slightly less of the project site. Similar to Alternative A and Alternative B, there would be no significant impacts associated with risks to the public due to earthquakes or unstable soils and there would be no impacts to paleontological resources. Compliance with existing requirements would mitigate for potential impacts associated with construction-related erosion. Impacts of the Tiered Alternative associated with geology, soils, seismicity, and paleontology would be similar to the impacts of Alternative A and Alternative B.

Hydrology and Water Quality

Alternative A and Alternative B would incorporate BMPs and meet NPDES permit requirements, and thus not result in any significant impacts to groundwater supply, increases in stormwater flows that could exceed capacity of stormwater infrastructure, or increases in sediment and erosion on local waterways during construction. All of these impacts were determined to be less than significant.

The Tiered Alternative would develop a mixed-use project similar to Alternative A and Alternative B but with a smaller area of disturbance. Therefore, it would entail fewer impacts to hydrology and water quality related to an increase in stormwater, loss of groundwater, and adequacy of stormwater infrastructure because development would occur on a smaller footprint and would decrease impervious surfaces as compared to Alternative A and Alternative B. Therefore, impacts would be similar to but slightly reduced compared to Alternative A and Alternative B.

Public Services and Utilities

Alternative A and Alternative B would have less than significant impacts related to existing public services including police, fire, solid waste disposal, emergency access, libraries, schools, and dry utilities. Alternative A and Alternative B would increase demand for these services and utilities but the demand would be consistent with the levels anticipated by the applicable service providers and impacts would remain less than significant.

The Tiered Alternative would develop a similar mixed-use project, although it would entail less commercial retail space than Alternative A and somewhat less residential units and more commercial space than Alternative B. This alternative would therefore result in a similar overall demand for services and similar impacts to public services and utilities as compared to Alternative A and Alternative B.

Hazards and Hazardous Materials

Alternative A and Alternative B would result in less than significant impacts related to the use, transport, or handling of hazards and hazardous materials during project construction and operation. Impacts related to hazards and hazardous materials would be less than significant under Alternative A and Alternative B. The same site remediation required for Alternative A and Alternative B would occur under the Tiered Alternative. This alternative would result in similar less-than-significant impacts related to hazards and hazardous materials as Alternative A and Alternative B.

Energy Consumption

Construction and operation of Alternative A and Alternative B would result in less-than-significant impacts associated with energy consumption. Because the Tiered Alternative would entail a smaller construction footprint than Alternative A and Alternative B, it would result in similar but reduced construction-related impacts to energy consumption as Alternative A and Alternative B. This alternative would consume slightly less energy than Alternative A because it would entail the same number of residential units and slightly less commercial retail space, which would reduce the amount of vehicle trips and on-site electrical consumption at the project site. This alternative would consume approximately the same amount of energy as Alternative B because it would involve fewer residential units but more commercial space. However, energy efficiency of the buildings constructed on site would be the same as Alternative A and Alternative B, thus impacts related to energy consumption would be similar and would remain less than significant.

17.4 SUMMARY MATRIX

A matrix displaying the major characteristics and significant environmental effects of each alternative is provided in Table 17-1 to summarize the comparison of impacts for each alternative.

Table 17-1
Project Alternatives Impacts Summary

Environmental Issue	Alternative A	Alternative B	No Project/ No Build	No Project/Existing Designations	Reduced Development	Vertical Mixed Use	Tiered
Land Use	LTS	LTS	▼	—	—	—	—
Population and Housing	LTS	LTS	▲ (remains LTS)	—	—	—	— relative to Alt A ▼ relative to Alt B
Biological Resources	LTS	LTS	▼	—	▼	▼	▼
Cultural Resources	LTS	LTS	▼	—	—	—	—
Visual Resources	LTS	LTS	▼	—	▼	—	▼
Transportation and Circulation	LTS	LTS	▼	▼	▼	—	▼ relative to Alt A — relative to Alt B
Noise	LTS	LTS	▼	—	▼	—	▼
Air Quality	LTS	LTS	▼	▼	▼	▼	▼ relative to Alt A ▲ relative to Alt B
Climate Change	SU	SU	▼	▼ (remains SU)	▼ (remains SU)	▼ (remains SU)	▼ relative to Alt A ▲ relative to Alt B (remains SU)
Geology, Soils, Seismicity, and Paleontology	LTS	LTS	▼	—	—	—	—
Hydrology and Water Quality	LTS	LTS	▼	—	—	▼	▼
Public Services and Utilities	LTS	LTS	▼	—	▼	—	—
Hazards and Hazardous Materials	LTS	LTS	—	—	—	—	—
Energy Consumption	LTS	LTS	▼	—	—	—	—

▲ Alternative is likely to result in greater impacts to issue when compared to proposed project.
— Alternative is likely to result in similar impacts to issue when compared to proposed project.
▼ Alternative is likely to result in reduced impacts to issue when compared to proposed project.
LTS = Less than significant impact.
SU = Significant and unavoidable impact.

17.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

As shown in Table 17-1, the Reduced Development Alternative would provide for reductions in the severity of impacts associated with biological resources, visual resources, transportation, noise, air quality, and public services. However all of these impacts would remain less than significant under Alternative B while Alternative A would result in a single significant and unavoidable impact to transportation. Additionally, the Reduced Development Alternative would reduce the severity of impacts related to GHG emissions and climate change, but the impact would remain significant and unavoidable in all alternatives. Because the Reduced Development Alternative would reduce the severity of several impacts, this is the Environmentally Superior Alternative.

APPENDIX E

Biological Technical Report

Dorsey Marketplace Development Project
Biological Technical Report
City of Grass Valley, California

Prepared for:

The City of Grass Valley
125 E. Main Street
Grass Valley, CA 95945
Contact: Thomas Last, Community Development Director

Prepared by:

DUDEK
853 Lincoln Way, Suite 208
Auburn, CA 95603
Contact: Laura Burris
LBurris@dudek.com
530-863-4656

JULY 2016, REVISED AUGUST 2019

TABLE OF CONTENTS

Section **Page No.**

APPENDICES

FIGURES

TABLES

1 INTRODUCTION

This assessment describes the existing conditions for the proposed Dorsey Marketplace Project site in the community of Grass Valley, Nevada County, California (Figure 1). This report provides a preliminary assessment of the biological resources observed or potentially present on the site, potential constraints associated with development of the site, and related regulatory requirements.

1.1 Project Location

The proposed project site is located in the City of Grass Valley, which is located along State Route (SR) 20/49 between Nevada City and Alta Sierra. The project site is bordered by SR 20/49 to the west, Dorsey Drive to the north, the Old Barn and Ernie's Storage to the south and the Grass Valley Terrace Apartments to the east. The project would be accessible from Dorsey Drive and from Spring Hill Drive, which accesses Idaho-Maryland Road. The project is located in Section 23, Township 16 North, and Range 8 East of the U.S. Geological Survey (USGS) Grass Valley 7.5' quadrangle. The approximate center of the site corresponds to 39°13'39.3" North latitude and 121°2'31.7" West longitude (Figure 2).

1.2 Project Description

The currently proposed project at Dorsey Marketplace involves developing an approximately 27-acre parcel of land. Proposed land uses include commercial, residential, and recreational facilities. Two project designs are being considered; the development footprint would be substantially the same under either design.

The proposed project is requesting a General Plan Amendment and rezone to change the land use designation on the site from Business Park to Commercial (21.2 acres) and Residential Urban High Density (5.7 acres). The project is also requesting a rezone from Corporate Business Park to Commercial (C-2) and Residential (R-3). This would facilitate the proposed development. One project design would construct 181,900 square feet of commercial building space and 90 multi-family dwelling units. The other project design would construct 171 apartments, approximately 105,000 square feet of commercial space, and approximately 8,500 square feet of office space. Within the commercial component of the project, each project design includes four pads for drive-through restaurants (with sizes ranging between 3,000 and 4,000 square feet) while the number and size of major shops and small shops varies between the two designs. The proposed dwelling units would be offered as market-rate rental units and are expected to include 1-, 2-, and 3-bedroom units. They would be constructed as two-story buildings in the southeast corner of the project site in the project design that includes 90 apartments. In the project design that includes 171 apartments, the dwelling units would be constructed in two-story buildings in

both the southeast and southwest corners of the site; some of the buildings in the southwest corner would also include the 8,500 square feet of office space included in this design. In both designs, the residential area would include an apartment clubhouse and pool and a tot lot and small dog park would also be provided within the project site.

2 REGULATORY BACKGROUND

Federal

The following federal regulations pertaining to biological resources would apply to the proposed project.

Federal Endangered Species Act

The Federal Endangered Species Act (FESA) (16 USC 1533) gives joint authority to list a species as threatened or endangered to the Secretary of the Interior (represented by the U.S. Fish and Wildlife Service) and the Secretary of Commerce (represented by the National Marine Fisheries Service). Under FESA, the "take" of endangered or threatened fish, wildlife, or plants species or adverse modifications to critical habitat, in areas under federal jurisdiction is prohibited. Under the Act take is defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct". The USFWS and NMFS have interpreted the definition of "harm" to include significant habitat modification that could result in the take of a species.

Either an incidental take permit under Section 10(a) or an incidental take statement under Section 7 is required if an activity would result in the take of a federally listed species. Section 7 requires the reviewing agency to determine whether any federally listed species, or species proposed for listing, may be present on the project site and if the project is likely to affect the species. Additionally, the reviewing agency must determine if a proposed project is likely to jeopardize the existence of a listed species or a proposed listed species, or result in destruction or adverse modification of proposed or designated critical habitat for such species. FESA requires the federal government to designate "critical habitat" for any listed species, which is defined as specific areas within the geographical area occupied by the species at the time of listing if they contain physical or biological features essential to the species conservation, and those features that may require special management considerations or protection. Additionally, it includes specific areas outside the geographical area occupied by the species if the regulatory agency determines that the area itself is essential for conservation.

USFWS and/or NMFS must authorize projects where a federally listed species is present and likely to be affected by an existing or proposed project. Generally, terrestrial and freshwater fish species are under the jurisdiction of USFWS, while marine and anadromous fish species are under the jurisdiction of NMFS. Project authorization may involve a letter of concurrence that the project will not result in the take of a listed species, or a Biological Opinion that describes what measures must be undertaken to minimize the likelihood of an incidental take. Projects determined by USFWS and NMFS to jeopardize the continued existence of a species cannot be

approved under a Biological Opinion. Take that is incidental to the lawful operation of a project is permitted under Section 10(a) through approval of a Habitat Conservation Plan (HCP), where a federal agency is not authorizing, funding, or carrying out the project.

Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) (16 USC Section 703, Supp. I, 1989) regulates and prohibits taking, killing, possessing, harming, or trading in migratory birds. The act addresses whole birds, parts of birds, and bird nests and eggs. This international treaty for the conservation and management of bird species that migrate through one or more countries is enforced in the United States by the U.S. Fish and Wildlife Service.

Clean Water Act

The objective of the Clean Water Act (CWA) is to restore and maintain the chemical, physical and biological integrity of waters of the United States (as defined in the Code of Federal Regulations 33 CFR 328.3[a]). Section 401 of the Act (33 USC 1341) prohibits the discharge of any pollutant into waters of the United States. Project applicants for a federal license or permit to conduct activities including, but not limited to, the creation or operation of facilities, which may result in discharge into waters of the United States, must obtain certification that the project would not violate applicable effluent limitations and water quality standards. Section 404 of the Act (33 USC 1344) requires a federal license or permit from the Army Corps of Engineers prior to the discharge of dredge or fill material into waters of the United States, unless activity is exempt from Section 404 permit requirements. Permit applicants must demonstrate that they have attempted to avoid or minimize impacts on the resource; however, if no further minimization of impacts is possible, the applicant is required to mitigate remaining impacts on all federally-regulated waters of the United States. In California the State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCBs) are responsible for the protection of water quality.

State

The following state regulations pertaining to biological resources would apply to the proposed project.

California Endangered Species Act

The California Endangered Species Act and Section 2081 of the California Department of Fish and Game Code identifies measures to ensure state-listed species and their habitats are conserved, protected, restored and enhanced. The Act requires permits from the CDFG for activities that could result in the take of a state-listed species threatened or endangered species.

"Take" is defined as to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill (Fish and Game Code Section 86). Section 2080 of the Fish and Game Code prohibits the take of state-listed plants and animals unless otherwise permitted under Sections 2080.1, 2081, and 2835. Section 20814(b) affords CDFG the authority to issue permits for incidental take for otherwise lawful activities. To authorize an incidental take the impacts of the take must be minimized and fully mitigated. Issuance of incidental take permits for may not jeopardize the continued existence of a state-listed species. For species listed as threatened or endangered under FESA, CDFG may rely on a federal incidental take statement or permit to authorize an incidental take under CESA.

The California Fish and Game Commission maintains a list of threatened and endangered species (Fish and Game Code Section 2070). The California Fish and Game Commission maintains two additional lists; a Candidate species list, which identifies species under review for addition to either the endangered or threatened species list, and a species of special concern list which serves as a watch list based on limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value.

California Fully Protected Species and Species of Special Concern

The classification of "fully protected" was the CDFG's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. California Fish and Game Code sections (fish at Section 5515, amphibians and reptiles at Section 5050, birds at Section 3511, and mammals at Section 4700) dealing with "fully protected" species states that these species may not be taken or possessed at any time and no provisions in this code or any other law shall be construed to authorize permits for the take of fully protected species. Species of special concern are broadly defined as animals not listed under the FESA or CESA, but which are nonetheless of concern to the CDFG because are declining at a rate that could result in listing or historically occurred in low numbers and known threats to their persistence currently exist. This designation is intended to elicit special consideration for these animals by the CDFG, land managers, consulting biology, and others. Additionally, this is intended to stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species, and focus research and management attention on them.

California Department of Fish and Game Code Section 3503

Birds of prey are protected in California under the Fish and Game Code (Section 3503.5, 1992). Under Section 3503.5 it is "unlawful to take, possess, or destroy any birds in the order Falconiformes (diurnal birds of prey) or Strigiformes (owls) or to take, possess, or destroy any nest or egg of any bird except as otherwise provided by this code or any regulation adopted

pursuant thereto." Disturbance during breeding season that results in the incidental loss of fertile eggs or nestlings or otherwise leads to nest abandonment is considered "taking" by the CDFG.

California Native Plant Protection Act

The California Native Plant Protection Act (California Fish and Game Code Sections 1900-1913) and the Natural Communities Conservation Planning Act provide guidance on the preservation of plant resources. Vascular plants which have no designated status or protection under state or federal endangered species legislation, but are listed as rare or endangered by the CNPS, are defined as follows:

1. ~~List~~ California Rare Plant Rank (CRPR) 1A: Plants presumed extinct
2. ~~List~~ CRPR 1B: Plants rare, threatened, or endangered in California and elsewhere
3. ~~List~~ CRPR 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere
4. ~~List~~ CRPR 3: Plants about which more information is needed – a review list
5. ~~List~~ CRPR 4: Plants of limited distribution – a watch list

Generally, plants ~~on CNPS List~~with CRPR 1A, 1B, or 2 are considered to meet the criteria for endangered, threatened or rare species as outlined by Section 15380 of the CEQA Guidelines. Additionally, plants listed on CNPS List 1A, 1B, or 2 also meet the definition of Section 1901, Chapter 10 (Native Plant Protection Act) and Sections 2062 and 2067 (CESA) of the California Fish and Game Code.

California Department of Fish and Game Code Sections 1600-1616

Under Sections 1600-1616 of the California Fish and Game Code, CDFG regulates activities that would substantially alter the flow, bed, channel, or bank of streams and lakes. Such activities require a 1602 Lake and Streambed Alteration Agreement from the CDFG. California Code of Regulations (CCR) defines a stream as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). The term stream includes rivers, creeks, ephemeral streams, dry washes, canals, aqueducts, irrigation ditches and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. Removal of riparian vegetation also requires a Section 1602 Lake and Stream Alteration Agreement from the CDFG.

State Water Resources Control Board

The State Water Resources Control Board (SWRCB) administers Section 401 of the CWA which requires that an applicant for a Section 404 permit first obtain a certification, or waiver thereof, that the project will not violate applicable state water quality standards. The authority to either grant certification or waive the requirement for certification has been delegated by the SWRCB to nine regional boards, including, in Sonoma County the North Coast Regional Water Quality Control Board (NCRWQCB). The SWRCB protects all waters of the State, but has special responsibility for isolated wetlands and headwaters. These waterbodies have high resources value but are vulnerable to filling and may lack regulation by other programs. Projects that require a USACE permit, or fall under other federal jurisdiction, and have the potential to impact waters of the State are required to comply with the terms of the Water Quality Certification Program. If a proposed project does not require a federal license or permit, but does involve activities that may result in a discharge of harmful substances to waters of the State, the Water Boards have the option to regulate such activities under its State authority in the form of Waste Discharge Requirements or Certification of Waste Discharge Requirements.

3 PROJECT SETTING

3.1 Land Uses

The project site is characterized as chaparral and coniferous woodland with several developed areas (Figure 3). It was the former location of the Spring Hill Mine, which operated at the site intermittently during the late 1800s and through the 1940s. Abandoned mine features located onsite include excavations, pits, remnants of building foundations, stockpiles of mine waste rock, and dry tailings ponds (Holdrege & Kull 2012). The project site is bounded on all sides by urban development.

3.2 Soils and Topography

In general, the native topsoil consists of clay, gravelly clay, and sandy clay; beneath the clay layer is the bedrock consisting of diabase and serpentine rock, which, in the trenches that appear on the site, are moderately to severely weathered. In these trenches, the clay layer over of the serpentine and diabase is approximately 2.5 feet thick. The Dubakella complex dominates the majority of the site's soil conditions (NRCS 2016). The site is a part of the ultramafic-mafic 'basement' of the Lake Combie complex. According to the Natural Resources Conservation Service (USDA 2016) the three soil types mapped within the site and include: Placer diggings; Rock outcrop-Dubakella complex, 5 to 50 percent slopes; and Sites loam, 9 to 15 percent slopes.

Placer diggings are generally found where historic mining practices have altered the land. Placer diggings consist of numerous minor components. Rock outcrops-Dubakella complex soils consist of ultrabasic rock outcrops in Dubakella soils on hills and mountains. These are rocky, well-drained soils that often contain serpentinite components. Sites loams consist of well-drained clay loams derived from metabasic residuum weathered from metasedimentary rock.

3.3 Watershed and Hydrology

The project site is located in the Upper Bear hydrological unit (HUC 18020126). Aquatic features within the site include numerous erosional channels and one depression at the southwestern end of the project site (Figure 4). Based on historic aerial photography and visual inspection during the site survey, these features are only periodically inundated and tend to remain inundated for short periods, depending on frequency and duration of rainfall events.

A formal wetland delineation has not been completed for the site. However, based on the site assessment, the numerous erosional features onsite appear to be the result of erosion of uplands from rainwater runoff and likely do not meet the three criteria for wetlands including hydrophytic vegetation, hydrology, and soils. Several flat areas at the top of the hill crest, in the center of the project site, were inundated with rainwater at the time of the site surveys; however,

they did not contain any other indicators of hydrology, wetland vegetation, and were unlikely to remain inundated for extended periods of time. It is unlikely any of these features would be considered waters of the United States and the State of California, and would therefore not require permits from CDFW, ACOE and RWQCB if impacts to these features from development of the property are unavoidable. Although the depression at the southwestern end of the project site did not display any hydrophytic vegetation other than cottonwood trees on the margin, and was not inundated at the time of the site survey, this area appears to collect water that drains from the some of the linear drainage features and the sloped areas in the central portion of the site. The water exits this depression and enters travels through an intermittent drainage before entering a culvert and going underground at the southern property boundary. This depression and intermittent drainage may be considered jurisdictional by the ACOE or the RWQCB if the water moves through the storm drain system under the development to the south of the project site and eventually intersects with Wolf Creek to the south.

4 METHODOLOGY

4.1 Literature Review and Background Research

Prior to conducting fieldwork, the following available resources were reviewed to assess the potential for biological and wetland resources within the study area and vicinity:

- a 1:200-scale aerial photograph (Bing Maps 2014; Google Earth 2014),
- the USGS 7.5-minute topographic quadrangle (USGS 2014),
- a records search of the California Natural Diversity Database (Figure 3; CDFW 2016),
- a list of plants generated by a query of the California Native Plant Society's Inventory of Rare and Endangered Plants (CNPS 2016),
- A list of species generated from a review of the US Fish and Wildlife Service's (USFWS) list of federal endangered and threatened species (USFWS 2016),
- the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2016), and
- the National Wetland Inventory (USFWS 2016).

4.2 Site Survey

Potential biological and wetland constraints were assessed in the field by Dudek biologist Laura Burris on March 4 and July 22, 2016. The site surveys consisted of walking the project area to identify habitat conditions, document all plant and animal species observed, and to determine if potential wetlands and waters of the U.S. were present within the project site. A follow-up evaluation of potential wetland resources was conducted by Dudek biologists Laura Burris and Tera Stoddard on July 27, 2016. The Dudek biologist collected georeferenced photographic records that represent the onsite habitats and wetlands (Appendix A).

4.2.1 Vegetation Community and Land Cover Types

The surveys were conducted on foot to visually cover the entire site. An aerial photograph (Google Earth 2015) with an overlay of the property boundary, and surrounding buffer was utilized to map the vegetation communities and record any special-status or sensitive biological resources while in the field. Nomenclature for vegetation communities follows A Manual of California Vegetation, Second Edition (Sawyer, et.al. 2009).

4.2.2 Flora

All plant species encountered during the field survey were identified to the lowest taxonomic group possible and recorded directly into a field notebook. Common and scientific names for plant species with a California Rare Plant Rank (CRPR, formerly CNPS List) follow the CNPS On-Line Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2015). Nomenclature for all other plant species observed on the site follows The Jepson Manual, Vascular Plants of California, Second Edition (Baldwin, ed 2012). A list of plant species observed on the site is presented in Appendix B.

4.2.3 Fauna

Wildlife species detected during the field survey by sight, calls, tracks, scat, or other signs were recorded directly into a field notebook. The site was scanned with and without binoculars to aid in the identification of wildlife. In addition to species actually detected during the surveys, expected wildlife use of the site was determined by known habitat preferences of local species and knowledge of their relative distributions in the area.

4.2.4 Jurisdictional Wetlands

Dudek conducted a constraints-level analysis for potentially jurisdictional waters and wetlands based on criteria provided by the following agencies:

- Waters of the U.S., including wetlands, under the jurisdiction of the U.S. Army Corps of Engineers (ACOE) pursuant to Section 404 of the federal Clean Water Act.
- Wetlands under the jurisdiction of the Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the Clean Water Act and the Porter-Cologne Act.
- Wetlands under the jurisdiction of CDFW, pursuant to Section 1602 of the California Fish and Game Code.

Pursuant to the federal Clean Water Act (CWA), ACOE- and RWQCB-jurisdictional areas include those supporting all three wetlands criteria described in the ACOE manual: hydric soils, hydrology, and hydrophytic vegetation. Areas regulated by the RWQCB are generally coincident with the ACOE, but may also include isolated features that have evidence of surface water inundation pursuant to the state Porter Cologne Act. These areas generally support at least one of the three ACOE wetlands indicators but are considered isolated through the lack of surface water hydrology/connectivity downstream. The extent of CDFW-regulated areas typically include

areas supporting a predominance of hydrophytic vegetation (i.e., 50% cover or greater) where associated with a stream channel.

Specifically, Dudek performed a constraints-level wetland assessment on the property, reviewed current and historical aerial photography, and then identified potentially jurisdictional features based on aerial signatures and field observations.

5 RESULTS OF SURVEY

A total of 40 species of vascular plants were recorded during the site surveys (Appendix B). Of these 40 species, 27 are native to California. The rest of these species are non-native. The timing of the surveys was chosen to ensure identification of plants onsite to a taxonomic level sufficient to determine rarity.

Seven wildlife species or sign were observed during the field surveys: northern flicker (*Colaptes auratus*), several unidentified sparrows, dark-eyed junco (*Junco hyemalis*), bushtit (*Psaltriparus minimus*), and raccoon (*Procyon lotor*) scat.

5.1 Land Cover Types

Five land cover types exist on the project site. The majority of the site consists of whiteleaf manzanita (*Arctostaphylos viscida*) chaparral, McNab cypress (*Hesperocyparis macnabiana*) woodland (Figure 4). The remaining portion of the project site consists of, Ponderosa pine (*Pinus ponderosa*) forest, Fremont cottonwood (*Populus fremonti*) woodland, and ruderal/developed. These land cover types are described in Table 1 and in further detail below.

Table 1
Vegetation Communities and Vegetation Types

Alliance	Vegetation Type	Acres
Arctostaphylos viscida shrubland	California chaparral	11.76
(NA)	Developed	0.69
(NA)	Disturbed/Ruderal	5.22
Populous fremontii	Cottonwood forest	0.65
Pinus ponderosa forest	Mixed coniferous forest	6.62
Callitropsis macnabiana forest	McNabb Cypress Woodland	3.33
	Total	**28.28**

Whiteleaf Manzanita Chaparral. There are approximately 11.8 acres of whiteleaf manzanita chaparral onsite. The whiteleaf manzanita chaparral is dominated in most areas by whiteleaf manzanita. In other areas, whiteleaf manzanita is codominant in the canopy with scrub oaks (*Quercus berberidifolia* and *Q. durata*) and ceanothus (*Ceanothus cuneatus*). The shrub canopy in the chaparral is dense and little vegetation grows under the shrubs. The few herbaceous species noted in the chaparral included bedstraw (*Galium aparine*). Openings in the chaparral were either barren or dominated by annual grasses and forbs.

McNabb Cypress Woodland. There are approximately 3.3 acres of McNabb cypress woodland onsite. McNabb cypress woodland is dominated by McNab cypress in the overstory. This canopy in this habitat type was generally short (less than 20 feet in height) and was either densely clustered or scattered with whiteleaf manzanita chaparral between trees. McNab cypress forms a dense canopy and herbaceous vegetation was minimal in the understory. This vegetation community is a fire-adapted species and is known to occur primarily on soils derived from basalt, conglomerate, gabbro, greenstone, or serpentine substrates (Sawyer et al 2009).

McNab cypress woodland has a State rarity ranking of S3.2 and a global rarity rank of G3 (CDFW 2010).

Ponderosa Pine Forest. There is approximately 6.6 acres of coniferous forest onsite. Ponderosa pine trees are the dominant plant in this vegetation community. The trees onsite are tall and well-spaced, allowing for the growth of a sparse shrub layer in the understory. The shrub layer consists of ceanothus, whiteleaf manzanita, toyon (*Heteromeles arbutifolia*), and immature madrone trees (*Arbutus menzesii*). Herbaceous vegetation is sparse and primarily consists of an unidentifiable lily.

Cottonwood Forest. An approximately 0.6-acre stand of mature Fremont cottonwood (*Populus fremontii*) occurs in the southwestern corner of the project site. This area is the lowest point on the property and it appears that water runoff from the hillside collects there. Associated species include Himalayan blackberry (*Rubus armeniacus*) and coyote brush (*Baccharis pilularis*). No standing water was noted at the time of the site surveys.

Cottonwood forest has a State rarity ranking of S3.2 and a global rarity rank of G4 (CDFW 2010).

Ruderal/Developed. Approximately 5.9 acres of ruderal/developed land cover occurs on the project site. Developed areas on the project site include a gravel parking lot at the northern end and several cleared dirt access roads. Additionally, historic mining facilities are present in the western portion of the project area, including cement foundations and mine tailing depressions. These areas have been altered through human disturbance and may support a variety of native and nonnative vegetation.

5.2 Special-Status Plant and Animal Species

For the purpose of this constraints evaluation, special-status plant and animal species are defined as those species that fall into one or more of the following categories:

1. Officially listed or proposed for listing under the State and/or Federal Endangered Species Acts.

2. State or Federal candidate for possible listing.

3. Species meeting the criteria for listing, even if not currently included on any list, as described in Section 15380 of the CEQA Guidelines.

4. Protected under the Federal Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act.

5. Species considered by the CDFW to be a "Species of Special Concern."

6. Species that are biological rare, very restricted in distribution, declining throughout their range, or have a critical, vulnerable stage in their life cycle that warrants monitoring.

7. Populations in California that may be on the periphery of a species' range, but are threatened with extirpation in California.

8. Species closely associated with habitat that is declining in California at an alarming rate (e.g., wetlands, riparian, old growth forests, desert aquatic systems, native grasslands, vernal pools, etc.).

9. Species designated as a special-status, sensitive, or declining species by other state, or federal agencies, or non-governmental organizations.

The potential occurrence of special-status plant and animal species on the Project site was initially evaluated by developing a list of special-status species that are known to or have the potential to occur in the Project vicinity. This list was primarily derived from a review of the California Natural Diversity Database (CDFG 2015), the CNPS Inventory of Rare and Endangered Plants (CNPS 2015), and the USFWS lists of federal endangered and threatened species (USFWS 2015) for all or some combination of the following USGS 7.5-minute quadrangles: Grass Valley, French Corral, Nevada City, North Bloomfield, Chicago Park, Rough and Ready, Wolf, Lake Combie and Colfax~~Redwood Point, Newark, Niles, Milpitas, Mountain View, Palo Alto, Mindego Hill, Cupertino, and San Jose West~~.

5.2.1 Special-Status Plant Species

Results of the CNDDB and CNPS searches revealed 11 special-status plant species that have potential to occur on or in the vicinity of the project site. Of these, four were removed from consideration due to lack of suitable habitat within or adjacent to the project area, or the project site is outside of the species' known range (refer to Appendix C). Four special-status plant species have low potential to occur at the project site due to lack of appropriate soil substrates or habitat onsite. Three special-status plant species have moderate potential to occur at the project

site. These include Stebbins' morning-glory (*Calystegia stebbinsii*), Follett's monardella (*Monardella follettii*), and Sierra blue grass (*Poa sierrae*). These species are discussed further in Table 2 and in the following section.

No special-status plants were observed during the field surveys. ~~; however, t~~The site survey conducted in March 2016 occurred ~~was conducted~~ at a time when special-status plants would not be evident and identifiable while the site survey conducted in July 2016 occurred at a time when special-status plants would be evident and identifiable.

Table 2
Special-status Plant Species with Potential to Occur in the Project site

Common Name	Scientific Name	Status (Federal/State/CNPS)
Stebbins' morning-glory	*Calystegia stebbinsii*	FE/ CE/ 1B.1
~~Dubious pea~~Follett's monardella	~~*Lathyrus sulphureus var. argillaceus*~~*Monardella follettii*	None/ None/ 1B.2~~3~~
Sierra blue grass	*Poa sierrae*	None/ None/ 1B.3

Sources: CNPS 2016, CDFW 2016, USFWS 2016

Stebbins' Morning-glory

Stebbins' morning-glory (*Calystegia stebbinsii*) is a perennial rhizomatous herb found in serpentine or gabbroic soils in openings in chaparral and cismontane woodland (CNPS 2016). This species generally blooms from April through July. This species is known from El Dorado and Nevada Counties at elevations ranging from 600 to 3,600 feet above mean sea level (amsl).

The nearest previously documented occurrence of Stebbins' morning-glory is located approximately 3.8 miles southwest of the project site in similar habitat (CDFW 2016). Openings in the chaparral and serpentine soils within the project area may provide potentially suitable habitat for this species; however, this species has been documented i~~-~~n Nevada County only in association with chaparral containing chamise (*Adenostoma fasciculatum*), manzanita (*Arctostaphylos* sp.), and foothill pine (*Pinus sabiniana*) (USFWS 2002). This species was not observed at the project site during the site surveys, one of which ~~were~~ was conducted when it would be evident and identifiable. Thus, it is unlikely this species occurs within the Project site.

~~Dubious Pea~~Follett's Monardella

Follett's monardella (Monardella follettii) is a perennial shrub found in lower montane coniferous forest with rocky, serpentine soils (CNPS 2016). This species generally blooms from

June through September (Jepson eFlora Project 2012). ~~Dubious pea (*Lathyrus sulphureus* var. *argillaceus*) is a perennial herb found in cismontane woodland, lower montane coniferous forest, and upper montane coniferous forest (CNPS 2016). This species generally blooms from April through July (Jepson eFlora Project 2012).~~ Follett's monardella is known from Nevada and Plumas counties at elevations range from 1,969 to 6,562 feet amsl. ~~This species is known from Calaveras, El Dorado, Nevada, Placer, Shasta, and Tehama counties at elevations ranging from 192 to 3,051 feet amsl.~~

Although the CNPS database indicates that this species has been documented in Nevada County, t~~T~~he nearest ~~previously~~ documented occurrence in the CNDDB ~~of dubious pea~~ is located ~~approximately 0.35 miles southwest~~more than 40 miles northeast of the project site ~~in similar habitat~~ (CDFW 2016). Montane coniferous forest onsite provides potentially suitable habitat for this species. ~~The common sweet pea (*Lathyrus latifolius*) was observed within the Project site. No other species of pea (*Lathyrus* spp.) were~~ This species was not noted during the site surveys, one of which ~~were~~ was performed when this plant would be evident and identifiable. Thus, it is unlikely this species occurs within the Project site.

Sierra Blue Grass

Sierra blue grass (*Poa sierrae*) is a perennial rhizomatous herb found in openings of lower montane coniferous forest (CNPS 2016). This grass species generally blooms from April through July. This species is known from Butte, El Dorado, Madera, Nevada, Placer, Plumas, and Shasta counties at elevations ranging from 1,198 to 4,921 feet amsl.

The nearest previously documented occurrence of this species is located approximately 7.5 miles southeast of the project site (CDFW 2016). The montane woodland onsite provides potentially suitable habitat for this species. This species was not observed within the project site during the site surveys, one of which ~~were~~ was performed when the grass species onsite, including those in the genus *Poa*, were evident and identifiable by habit, inflorescence, and fruit. Thus, it is unlikely this species occurs within the project site.

5.2.2 Special-Status Animal Species

Results of the CNDDB and USFWS searches revealed nine listed or special-status wildlife species, or species proposed for listing as rare, threatened, or endangered by either the CDFW or the USFWS. Of these, seven were removed from consideration due to lack of suitable habitat within or adjacent to the project area, or the project site is outside of the species' known range. These were California red-legged frog (*Rana draytonii*), foothill yellow-legged frog (*Rana boylii*), western pond turtle (*Actinemys marmorata*), California black rail (*Laterallus jamaicensis coturniculus*), Sierra Nevada red fox (*Vulpes vulpes necator*), west coast distinct population of

fisher (*Pekania pennant*), and valley elderberry longhorn beetle (*Desmocerus californicus dimpophus*). No suitable riparian or aquatic habitat exists for California red-legged frog, foothill yellow-legged frog, California black rail, or western pond turtle. There is an extremely low possibility of California black rail to utilize the depression in the southwest corner of the project site on the site due to its exposed nature and small size.

Blainville's horned lizard (*Phrynosoma blainvillii*) and northern goshawk (*Accipiter gentilis*) have low potential to be present within the site based on the available habitat. These species are discussed in Table 3 and in the following section.

Table 3
Special-status Animal Species with Potential to Occur in the Project site

Common Name	Scientific Name	Status (Federal/State)
Birds		
Northern goshawk	*Accipiter gentilis* (nesting)	None/ SSC
Reptiles		
Blainville's horned lizard	*Phrynosoma blainvillii*	None/ SSC

Sources: CDFW 2016, USFWS 2016

All raptor species found in California are protected by California Fish and Game Code 3503.5 and may use the site for nesting or foraging. Although raptor species have the potential to nest on the site and forage adjacent to the site, the site does not provide substantially important habitat, due to its small size, that would affect raptor species from continuing to exist within the area.

Northern Goshawk

Northern goshawks are known to nest within ponderosa pine forest; however, the site is surrounded by development and highly degraded areas and it is unlikely that this species would utilize this isolated stand for nesting (Shuford ed. 2008). Additionally, this species was not observed during the site survey. It is unlikely this species is nesting within the site.

Blainville's Horned Lizard

Blainville's horned lizard prefers sandy soil substrates; thus, although the openings in the chaparral habitat may provide potentially suitable habitat, it is unlikely this species would occur on the project site due to the lack of appropriate soils (Zeiner, ed. 1988-1990). This species was not observed within the project site during the March site assessment; however, the weather

during the site visit was cold and rainy and this species may not have been very active under such conditions. Additionally, no Blainville's horned lizard individuals were observed within the project site during the July site assessment when the weather was more conducive to supporting activity by this species.

5.3 Sensitive Resources and Habitats

Sensitive natural communities onsite include McNabb cypress woodland and a small stand of Fremont cottonwood forest in the southwestern corner of the site. ~~One sensitive natural community occurs within the project site: McNabb cypress woodland.~~ The location and extent of these resources are depicted in Figure 4. ~~This~~ McNabb cypress woodland is ranked S3.2 and G3 and is known in the Sierra Nevada only from a few isolated stands in Butte, Yuba, Nevada, and Amador counties (Sawyer et al 2009). These habitats onsite have been disturbed in the past by adjacent development and are isolated from other similar habitat by surrounding urbanization.

5.4 Wildlife Corridors and Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation; they may be continuous habitat or discrete habitat islands that function as stepping stones for wildlife dispersal.

The project site is bounded on all sides by development and is not contiguous with any wildlife habitat or corridors. The site may provide important island habitat for birds and other wildlife adapted to urban environments.

5.5 Aquatic Resources

The site visit conducted on July 27, 2016 focused on potentially jurisdictional aquatic features that were noted during the previous two site visits. Table 4 presents the aquatic features that were identified within the Project site and their potential jurisdiction. These features are displayed graphically in Figure 4.

Table 4: Potentially Jurisdictional Wetlands and Waters of the U.S.

Feature ID	Cowardin Code	Potential Jurisdiction	Acres	Linear Feet
Drainages				
Cement-lined drainage	None	None	0.05	750.00
Ephemeral Drainage – 01		None	0.016	350.50
Intermittent Drainage – 01		ACOE/RWQCB	0.011	118.00
		Total	**0.077**	**1,218.50**
Wetlands				
Seasonal Wetland – 01		ACOE/RWQCB	0.065	N/A
		Total	**0.065**	**N/A**

Drainages

Three types of linear drainages were observed in the project site: Cement-lined drainage, ephemeral drainage (ED), and intermittent drainage (ID). One wetland feature was observed at the site: seasonal wetland (SW). The Cement-lined drainage appears to have been constructed as part of the drainage system for the SR 20/49 and associated off-ramps. The drainage conveys rainwater runoff during storm events north to south through the western edge of the Project site. The water drains to ED-01, where it travels through a vegetated channel and appears to drain to SW-01.

Water from the surrounding hillsides appear to also collect at SW-01. Water exits SW-01 and travels through ID-01 before entering a culvert and going underground at the southern property boundary. Any connectivity to downstream waters of the U.S. is not apparent; however, if this water does move through the storm drain system under the development to the south of the Project site, and eventually intersects with Wolf Creek to the south, there is potential that ID-01 and SW-01 may be considered jurisdictional by the ACOE or the RWQCB.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Potential Impacts

6.1.1 Special-Status Plant Species

Three special-status plant species have ~~moderate~~ potential to occur within the project site: Stebbins' morning-glory, ~~dubious pea~~Follett's monardella, and Sierra blue grass. No special-status plant species were observed on the site during the surveys, which were conducted when the species would be evident and identifiable.~~; however, the site survey was conducted when the plants were not evident or identifiable. Because there is suitable habitat for special-status plant species at the project site, there is potential that these species may be present~~ Thus, impacts to special-status plant species are not anticipated to occur.

Although special-status plant species were not observed during the site survey, they could become established within the project site in subsequent years if conditions are favorable (climate, rainfall, seed dispersal from other local populations). If construction does not occur within one year of the plant surveys, there is potential that special-status plants could become established. Direct impacts to special-status plant species could result from project implementation as a result of ground disturbance and vegetation clearing. To reduce potential for impacts, avoidance and minimization measures including preconstruction surveys during the appropriate time of year, are included in Section 6.2.

6.1.2 Special-Status Wildlife Species

Two special-status species have the potential to utilize the site for nesting, foraging, cover and/or local migration routes. All native birds in California are protected by the federal Migratory Bird Treaty Act (MBTA) of 1918 and Section 3503.5 of the California Fish and Game Code, which specifically protects raptors. The site has suitable nesting habitat for several common raptor and other nesting bird species found in California such as northern flicker.

6.1.3 Sensitive Natural Communities

Potential impacts from the proposed project would occur to all land covers types present on site as described in Section 5. Sensitive natural communities onsite include McNabb cypress woodland and a small stand of Fremont cottonwood forest in the southwestern corner of the site. Dudek recommends avoidance of sensitive habitats to the extent feasible through the establishment of avoidance buffers prior to construction. If avoidance is not feasible, further mitigation such as enhancement, restoration, or compensation would be necessary.

6.1.4 Aquatic Resources

The erosional features throughout the site, the cement-lined drainage, and the vegetated upland swale of ED-01 are not likely jurisdictional under regulation of the ACOE, RWQCB, and CDFW. However, SW-01 and ID-01 may be considered jurisdictional if there is some connectivity or adjacency to other waters of the U.S. or state. Dudek recommends a detailed jurisdictional delineation be verified by the appropriate regulatory agencies (e.g., ACOE and CDFW) prior to any permanent plans for development of this property.

If any features are considered jurisdictional, impacts would require authorization from the resource agencies listed above in the form of wetland permits (e.g., 404 Nationwide Permit, 401 Water Quality Certification, and 1602 Streambed Alteration Agreement respectively). Required compensatory mitigation would provide no net loss of jurisdictional habitats. Examples of potential mitigation may include mitigation credits to be purchased at a wetlands mitigation bank, or alternatively, in-lieu fee mitigation could be arranged with the resource agencies. Permit processing can take six to nine months for minor impacts less than one half-acre in size; and up to 2 years for impacts greater than one half-acre with special status species impacts (Individual Permit). If the jurisdictional impacts exceed 300 feet, the project would technically require an Individual Permit, unless a waiver is granted to allow for issuance of a Nationwide Permit authorization.

6.2 Recommended Avoidance and Minimization Measures

With implementation of the following avoidance and minimization measures, potential impacts to special-status and sensitive biological and wetland resources should be reduced or eliminated.

AMM-01: Avoid Sensitive Habitat

- For the protection of potential wetland resources, McNab cypress forest, and cottonwood forest, these areas shall be avoided by all construction activities to the maximum extent feasible.

- If avoidance of potential wetland resources is not feasible, a wetland delineation and habitat assessment shall be prepared by a qualified biologist and consultation with the US Fish and Wildlife Service and the US Army Corps of Engineers would be required.

- If avoidance and preservation of McNab cypress forest is not possible, consultation with the CDFW would be required to devise appropriate onsite enhancement, restoration, or offsite compensation of impacts to sensitive natural communities such as McNab cypress woodland and cottonwood forest. For example, a 1:1 mitigation ratio for habitat

preserved to habitat impacted will be implemented through purchase of offsite habitat or mitigation credits.

AMM-02: Conduct Preconstruction Surveys

- If construction takes place during the nesting bird season (February 1 through September 30), a nesting bird survey shall be completed by a qualified biologist two weeks prior to construction to determine if any birds are nesting on or near the site (including a 500 foot buffer for raptors). If no active nests are observed during the preconstruction survey, no further measures are required for nesting birds.

- If any active nests are observed during surveys, a suitable avoidance buffer from the nests will be determined and flagged by the qualified biologist based on species, location and planned construction activity. Consultation with CDFW may be required to determine appropriate buffer distances. These nests shall be avoided until the young have fledged and the nests are no longer active, as determined by the qualified biologist. Dudek also recommends removing any habitat (i.e. trees and brush) outside of the breeding bird season.

- Prior to construction, surveys for Blainville's horned lizard shall be conducted by a qualified biologist familiar with this species' biology. If this species is not observed during the preconstruction survey, no further measures for Blainville's horned lizard are required.

- If Blainville's horned lizard is noted within the project area, consultation with CDFW will be required to determine whether additional avoidance or mitigation measures are warranted.

AMM-03: Implement Worker Environmental Awareness Program

- A qualified biologist will develop and implement a worker environmental awareness program (WEAP) detailing protections for potential special-status species that may be encountered in or adjacent to the project site. The WEAP will describe identification and avoidance measures to ensure no impacts to special status species such as Blainville's horned lizard, special-status plant communities and species, and nesting birds.

7 REFERENCES CITED

16 U.S.C. 703–712. Migratory Bird Treaty Act, as amended.

AOU. 2012. Check-List of North American Birds: List of the 2,078 Bird Species Known From the AOU Check-list Area. Accessed from http://www.aou.org/checklist/north/full.php

California Department of Fish and Wildlife (CDFW). 2016. Special Animals List. Periodic publication. Natural Diversity Database. January 2016. 51 pp. Website https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline=1 (accessed March 2016).

CDFW. 2016b. California Natural Diversity Database (CNDDB). Rarefind, Version 5 (Commercial Subscription). Sacramento, California: CDFW, http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp.

CDFW. 2016c. "State and Federally Listed Endangered, Threatened, and Rare Plants of California." California Natural Diversity Database. CDFW, Biogeographic Data Branch. July 2015, http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEPlants.pdf.

CDFW. 2016. Special Vascular Plants, Bryophytes, and Lichens List. California Natural Diversity Database.http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp.

California Native Plant Society (CNPS), Rare Plant Program. 2016. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org (accessed February 2016).

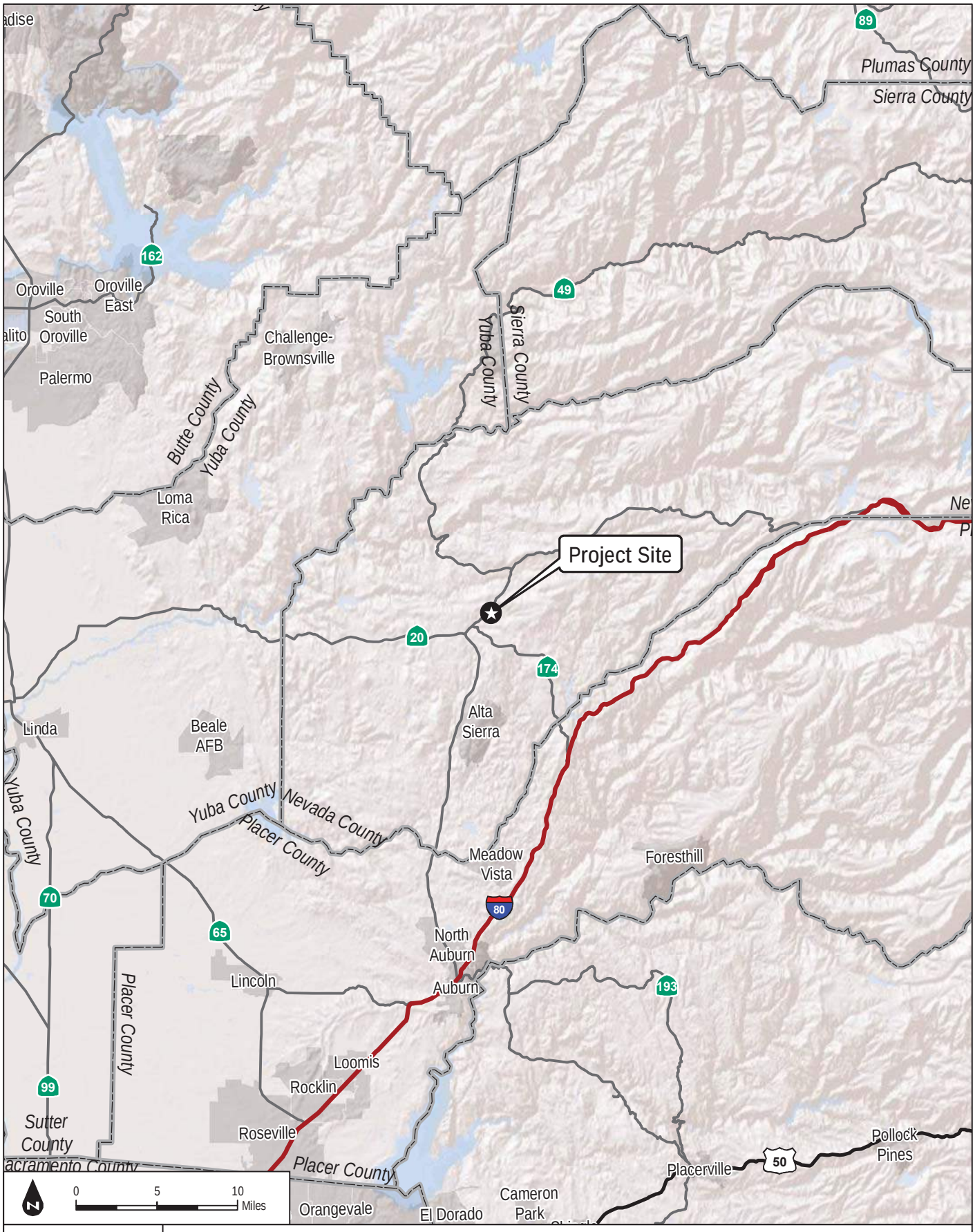
Jepson eFlora Project. 2012. Jepson eFlora. Berkeley, California: University of California. Accessed March 2016. http://ucjeps.berkeley.edu/cgi-bin/get_JM_name_data.pl

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento. 1300 pp.

Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

United States Fish and Wildlife Service (USFWS). 2002. Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills. Region 1, U.S. Fish and Wildlife Service, Portland, Oregon. August 30, 2002.

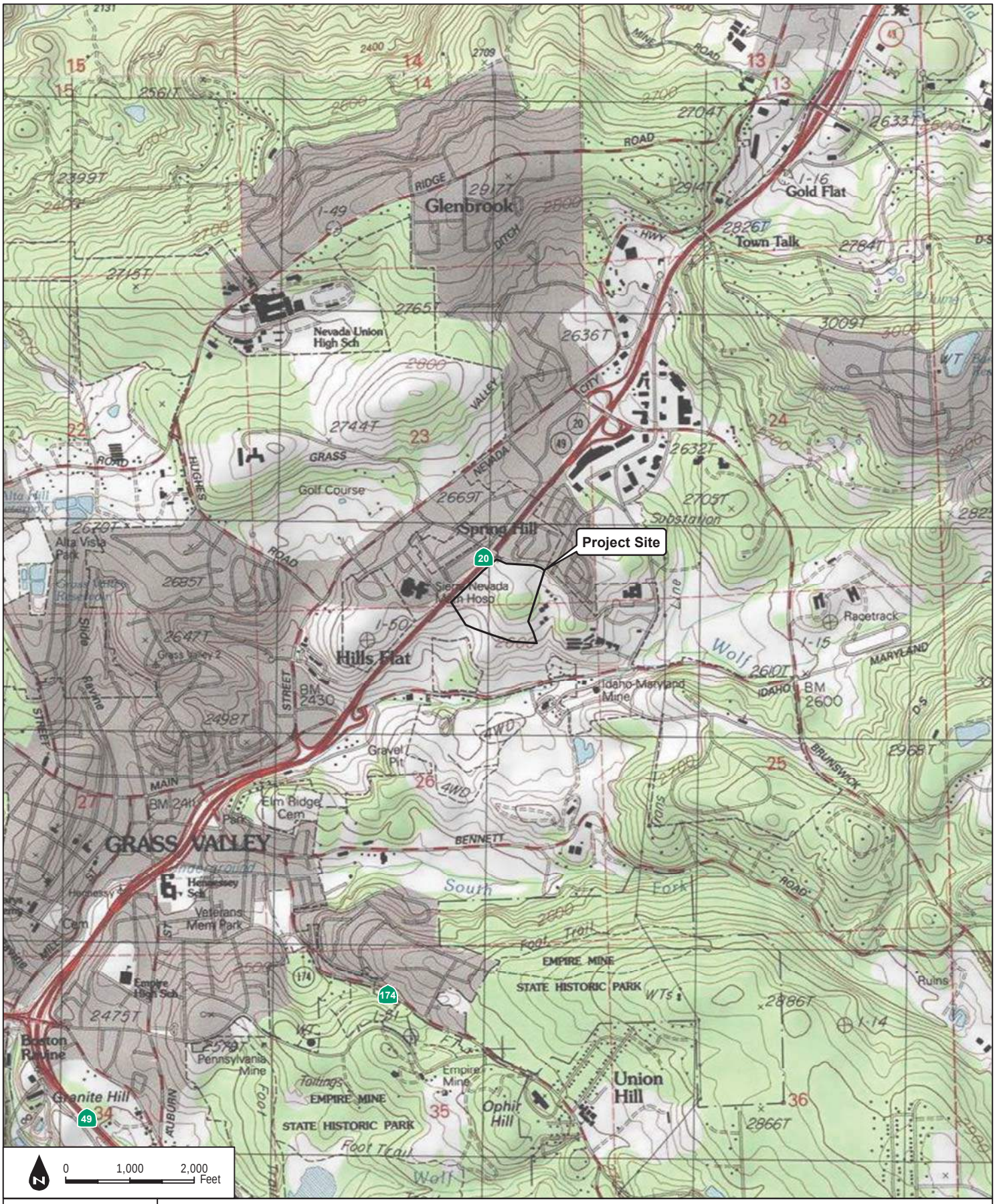
Zeiner, D.C., W.F.Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Depart. of Fish and Game, Sacramento, California.



DUDEK

FIGURE 1
Regional Map

Dorsey Marketplace Biological Technical Report



SOURCE: USGS Topo 7.5-Minute Grass Valley Quadrangle.

FIGURE 2

Site and Vicinity Map

DUDEK

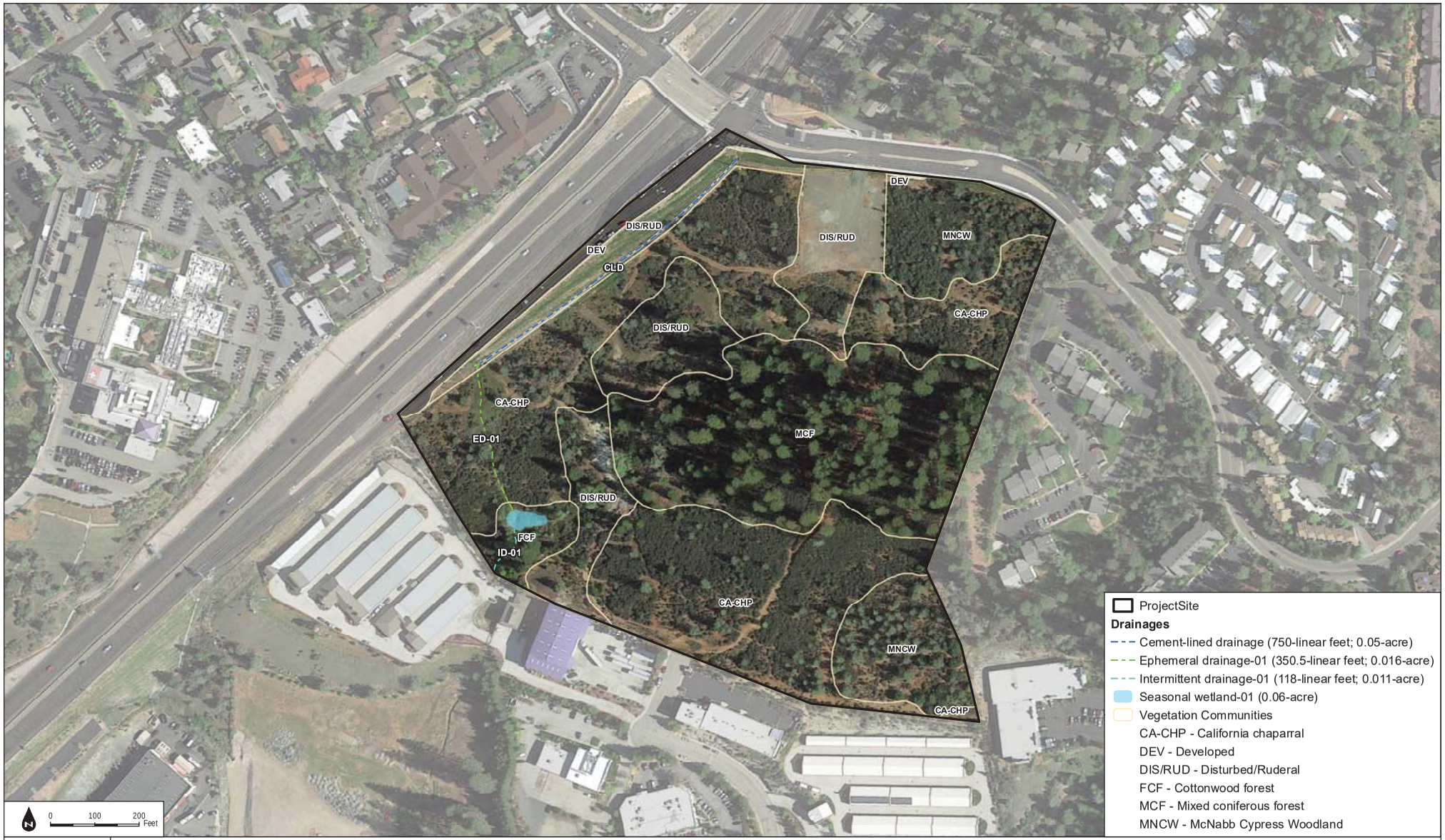
Dorsey Marketplace Biological Technical Report

SOURCE: Google Maps 2016

FIGURE 3
Vegetation Comminities

DUDEK

Dorsey Marketplace Biological Technical Report



DUDEK

SOURCE: Google Maps 2016

FIGURE 4

Potentially Jurisdictional Aquatic Features

Dorsey Marketplace Biological Technical Report

APPENDIX A

Representative Photos

Appendix A Representative Photographs of the Project Area

Photo 1: Typical view of McNabb cypress woodland within the northeastern corner of the project area, facing southwest.

Photo 2: Typical view of ruderal/disturbed areas within the project area with Ponderosa pine forest in the background, facing south.

Photo 3: Typical view of the whiteleaf manzanita chaparral, facing north.

Photo 4: Typical view of the ponderosa pine forest in the center of the project area, facing southeast.

APPENDIX B

Plant Species Observed

Vascular Plant Species Observed onsite

FERNS AND FERN ALLIES

PTERIDACEAE—Brake Family

Pentagramma triangularis—goldback fern

GYMNOSPERMS AND GNETOPHYTES

CUPRESSACEAE—Cypress Family

Calocedrus decurrens—incense cedar

Hesperocyparis macnabiana—McNab's cypress

PINACEAE—Pine Family

Pinus attenuata—knobcone pine

Pinus ponderosa—ponderosa pine

MONOCOTS

AGAVACEAE—Agave Family

Chlorogalum pomeridianum—wavyleaf soap plant

AMARYLLIDACEAE—Amaryllis Family

*Narcissus pseudonarcissus—daffodil

IRIDACEAE—Iris Family

Iris macrosiphon—bowltube iris

POACEAE—Grass Family

Muhlenbergia rigens—deergrass

Poa secunda—Sandberg bluegrass

*Arundo donax—giant reed

*Elymus caput-medusae—medusahead

*Hordeum murinum—mouse barley

EUDICOTS

ANACARDIACEAE—Sumac Or Cashew Family

Toxicodendron diversilobum—Pacific poison oak

APIACEAE—Carrot Family

*Daucus carota—Queen Anne's lace

APOCYNACEAE—Dogbane Family

*Vinca major—bigleaf periwinkle

ASTERACEAE—Sunflower Family

Artemisia douglasiana—Douglas' sagewort

Baccharis pilularis—coyotebrush

*Centaurea solstitialis—yellow star-thistle

BERBERIDACEAE—Barberry Family

Berberis aquifolium var. repens—creeping barberry

BORAGINACEAE—Borage Family

Eriodictyon californicum—California yerba santa

ERICACEAE—Heath Family
- Arbutus menziesii—Pacific madrone
- Arctostaphylos viscida ssp. viscida—sticky whiteleaf manzanita

FABACEAE—Legume Family
- Acmispon americanus var. americanus—American bird's-foot trefoil
- Pickeringia montana—chaparral pea
- *Ulex europaeus—common gorse
- *Vicia sativa—garden vetch

FAGACEAE—Oak Family
- Quercus durata—leather oak
- Quercus kelloggii—California black oak

GERANIACEAE—Geranium Family
- *Geranium dissectum—cutleaf geranium

LAMIACEAE—Mint Family
- Salvia sonomensis—creeping sage

PLANTAGINACEAE—Plantain Family
- *Plantago major—common plantain

POLYGALACEAE—Milkwort Family
- Polygala cornuta—Sierra milkwort

RHAMNACEAE—Buckthorn Family
- Ceanothus cuneatus var. cuneatus—buckbrush
- Ceanothus prostratus—prostrate ceanothus

ROSACEAE—Rose Family
- Heteromeles arbutifolia—toyon
- *Prunus cerasifera—cherry plum
- *Rubus armeniacus - Himalayan blackberry

SALICACEAE—Willow Family
- Salix laevigata—red willow
- Populus fremontii—Fremont cottonwood

SIMAROUBACEAE—Quassia Or Simarouba Family
- *Ailanthus altissima—tree of heaven

*Non-native species

APPENDIX C

Special-status Species Potential to Occur

Table 1: Special-status Plant Species Potential to Occur in the Project Site

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Calystegia stebbinsii	Stebbins' morning-glory	FE/ CE/ 1B.1	Chaparral (openings), Cismontane woodland/gabbroic or serpentinite/ perennial rhizomatous herb/ Apr-Jul/ 607-3,576	**Moderate potential to occur.** The chaparral and serpentine soil substrates onsite may provide suitable habitat for this species. The nearest documented occurrence for this species is located approximately 3.9 miles southwest of the project site.
Chlorogalum grandiflorum	Red Hills soaproot	None/ None/ 1B.2	Chaparral, Cismontane woodland, Lower montane coniferous forest/serpentinite, gabbroic and other soils/ perennial bulbiferous herb/ May-Jun/ 804-4,068	**Low potential to occur.** This species is known predominantly from the Pine Hill Ecological Reserve. However, the serpentine soils onsite may provide suitable habitat for this species.
Fremontodendron decumbens	Pine Hill flannelbush	FE/ CR/ 1B.2	Chaparral, Cismontane woodland/gabbroic or serpentinite, rocky/ perennial evergreen shrub/ Apr-Jul/ 1,394-2,493	**Not expected to occur.** The site is outside of the species' known elevation and geographic range.
Juncus digitatus	finger rush	None/ None/ 1B.1	Cismontane woodland (openings), Lower montane coniferous forest (openings), Vernal pools (xeric)/ annual herb/ (Apr),May-Jun/ 2,165-2,592	**Low potential to occur.** Although the seasonal pond onsite may provide potential habitat for this species, this habitat was dominated by non-native vegetation and no plants in the genus *Juncus* were noted in this habitat during the site visit.
Lewisia cantelovii	Cantelow's lewisia	None/ None/ 1B.2	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest/mesic, granitic, sometimes	**Low potential to occur.** Although the seasonal pond onsite may provide potential mesic habitat for this species, this habitat was

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
			serpentinite seeps/ perennial herb/ May-Oct/ 1,083-4,495	dominated by non-native vegetation and no plants in the genus *Lewisia* were noted during the site visit.
Lycopodiella inundata	inundated bog club-moss	None/ None/ 2B.2	Bogs and fens (coastal), Lower montane coniferous forest (mesic), Marshes and swamps (lake margins)/ perennial rhizomatous herb/ Jun-Sep/ 16-3,281	**Not expected to occur.** The site does not provide suitable mesic habitat required by this species.
Mielichhoferia elongata	elongate copper moss	None/ None/ 2B.2	Cismontane woodland (metamorphic, rock, usually vernally mesic)/ moss/ N.A./ 1,640-4,265	**Low potential to occur.** The site does not provide suitable vernally mesic habitat preferred by this species.
Monardella follettii	Follett's monardella	None/ None/ 1B.2	Lower montane coniferous forest (rocky, serpentinite)/ perennial shrub/ Jun-Sep/ 1,969-6,562	**Moderate potential to occur.** The rocky soils in the ponderosa pine forest may provide suitable habitat for this species.
Poa sierrae	Sierra blue grass	None/ None/ 1B.3	Lower montane coniferous forest/Openings/ perennial rhizomatous herb/ Apr-Jun/ 1,198-4,921	**Moderate potential to occur.** The ponderosa pine forest onsite may provide suitable habitat for this species.
Rhynchospora capitellata	brownish beaked-rush	None/ None/ 2B.2	Lower montane coniferous forest, Meadows and seeps, Marshes and swamps, Upper montane coniferous forest/mesic/ perennial herb/ Jul-Aug/ 148-6,562	**Not expected to occur.** The site does not provide suitable mesic habitat required by this species.
Sidalcea stipularis	Scadden Flat checkerbloom	None/ CE/ 1B.1	Marshes and swamps (montane freshwater)/ perennial rhizomatous herb/ Jul-Aug/ 2,297-2,395	**Not expected to occur.** The site is outside of the species' known elevation range and there is no suitable marsh or swamp habitat present.

Table 2: Special-status Wildlife Species Potential to Occur in the Project Site

Common Name	Scientific Name	Status (Federal/ State)	Habitat	Potential to Occur
Amphibians				
California red-legged frog	*Rana draytonii*	FT/ SSC	Lowland streams, wetlands, riparian woodlands, livestock ponds; dense, shrubby or emergent vegetation associated with deep, still or slow-moving water; uses adjacent uplands.	**Not expected to occur.** No suitable aquatic habitat is present at the project site.
Foothill yellow-legged frog	*Rana boylii*	None/ SSC	Rocky streams and rivers with open banks in forest, chaparral and woodland.	**Not expected to occur.** The site is outside of the species' known geographic range and there is no suitable stream habitat is present.
Reptiles				
Western pond turtle	*Actinemys marmorata*	None/ SSC	Slow-moving permanent or intermittent streams, ponds, small lakes, reservoirs with emergent basking sites; adjacent uplands used for nesting and during winter.	**Not expected to occur.** The site is outside of the species' known geographic range and there is no suitable aquatic habitat is present.
Blainville's horned lizard	*Phrynosoma blainvillii*	None/ SSC	Open areas of sandy soil in valleys, foothills and semi-arid mountains including coastal scrub, chaparral, valley-foothill hardwood, conifer, riparian, pine-cypress, juniper and annual grassland.	**Low potential to occur**. Although the openings in the chaparral may provide potentially suitable habitat for this species, there is no suitable sandy soil substrates preferred by this species present at the site. The nearest documented occurrence for this species is located approximately 1.1 miles west of the project site.
Birds				
California black rail	*Laterallus jamaicensis coturniculus*	BCC/ ST, FP	Tidal marshes, shallow freshwater margins, wet meadows and flooded grassy vegetation; suitable habitats are often supplied by canal leakage in Sierra foothill populations.	**Not expected to occur.** No suitable marsh habitat is present.

Common Name	Scientific Name	Status (Federal/ State)	Habitat	Potential to Occur
Northern goshawk	*Accipiter gentilis (nesting)*	None/ SSC	Nests primarily in middle and higher elevation dense conifer forests; winters at lower elevations along coast, foothills and northern deserts in riparian and pinyon-juniper woodland.	**Low potential to occur.** Although the ponderosa pine forest onsite provides suitable nesting and foraging habitat, it is very limited in distribution and is surrounded by development. It is unlikely this species would utilize the site for nesting.
Mammals				
Sierra Nevada red fox	*Vulpes vulpes necator*	None/ ST	Barren, conifer, and shrub habitats at high elevations during summer and red fir, mixed conifer, montane chaparral, and white fir forests during winter.	**Not expected to occur.** The site is outside of the species' known geographic range and there is no suitable vegetation present.
Fisher - West Coast DPS	*Pekania pennanti West Coast DPS*	PFT/ SC, SSC	Range widely in forested regions; uses heavy stands of mixed species of mature trees.	**Not expected to occur.** The site is outside of the species' known geographic range and the ponderosa pine forest onsite is limited in distribution and does not provide suitable habitat for this species.
Invertebrates				
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT/ None	Occurs only in the Central Valley of California, in association with blue elderberry (*Sambucus mexicana*).	**Not expected to occur.** The site is outside of the species' known geographic range and there is no suitable habitat (elderberry shrubs) present.