RESPONSES TO COMMENTS

INTRODUCTION

This Responses to Comments document has been prepared in response to comment letters that were submitted after initial public hearings on the Vista Mar Project (proposed project) and its associated Initial Study/Mitigated Negative Declaration (IS/MND). The comments responded to in this document were submitted in August and September of 2020, which is well outside of the public review period for the IS/MND, which lasted from January 13 to February 13 of 2020. At the City's discretion, a previous Responses to Comments document was prepared in May of 2020 to address all of the public comments submitted during the public review period for the project. This Responses to Comments document focuses only on those comments that were submitted in August and September following the initial Planning Commission hearing for the proposed project.

BACKGROUND

The City of Pacifica used the following methods to solicit public input on the IS/MND: a Notice of Completion of the IS/MND was posted with the State Clearinghouse on January 13, 2020. The IS/MND was distributed to applicable public agencies, responsible agencies, and interested individuals. In addition, electronic copies were available on the City's website at https://www.cityofpacifica.org/depts/planning/environmental_documents/default.asp. The public review period on the IS/MND ended February 13, 2020.

LIST OF COMMENTERS

The City of Pacifica received four comment letters outside of the public review period for the IS/MND and following the initial Planning Commission meeting on the project. The comment letters were authored by the following interested persons. The letters are organized by the order in which they were received.

Letter 1 .....Steven Bond, Steven Bond and Associates
Letter 2 .....Matt Hagemann and Paul E. Rosenfeld, Soil Water Air Protection Enterprise
Letter 3 ..... Patrick Kobernus, Principal Biologist, Coast Ridge Ecology
Letter 4 ..... Shawn Smallwood, Ph. D.

RESPONSES TO COMMENTS

The Responses to Comments below address the comments received following the close of the public review period. Raney Planning and Management, with assistance from WRA Environmental Consultants, prepared responses to Letters 2 through 4. Responses provided to Letter 1 were based on information obtained from the applicant's geotechnical consultant, GeoForenesics Inc, in a signed and stamped letter. Where revisions to the IS/MND text were made, new text is double underlined and deleted text is ~~struck through~~.

All such revisions to the IS/MND are relatively minor, and do not affect the adequacy of the conclusions presented therein. CEQA Guidelines Section 15073.5 states the following regarding recirculation requirements for negative declarations:

(c) Recirculation is not required under the following circumstances:

(1) Mitigation measures are replaced with equal or more effective measures pursuant to Section 15074.1.

(2) New project revisions are added in response to written or verbal comments on the project's effects identified in the proposed negative declaration which are not new avoidable significant effects.

(3) Measures or conditions of project approval are added after circulation of the negative declaration which are not required by CEQA, which do not create new significant environmental effects and are not necessary to mitigate an avoidable significant effect.

(4) New information is added to the negative declaration which merely clarifies, amplifies, or makes insignificant modifications to the negative declaration.

Based on the above, pursuant to CEQA Guidelines Section 15073.5, recirculation of the IS/MND is not warranted as mitigations measures are only being revised with equal or more effective measures, as new project revisions are added in response to written or verbal comments on the project's effect identified in the proposed mitigated negative declaration which are not new avoidable impacts, conditions of project approval added are not required by CEQA, do not create new significant environmental effects and are not necessary to mitigate an avoidable significant effect, and new information to the mitigated negative declaration merely clarifies, amplifies, or makes insignificant modifications to the mitigated negative declaration.

Steven Bond and Associates
CONSULTING GEOLOGISTS, GROUNDWATER, HYDROLOGY, AND WATER QUALITY EXPERTS
P. O. Box [redacted] Santa Cruz, CA 95061, v: [redacted]

18 September 2020

Bonny O'Connor, Associate Planner
City of Pacifica Planning Department
1800 Francisco Blvd.
Pacifica, CA 94044
o'connorb@ci.pacifica.ca.us

Subject: Vista Mar Project Initial Study / Mitigated Negative Declaration
City of Pacifica File No. 2002-001, PSD-714-02

Dear Ms. O'Connor,

1-1 I am a professional geologist specializing in engineering geology and hydrogeology. As an engineering geologist and hydrogeologist, I evaluate the flow of groundwater, the stability of slopes, and the erosion potential of soils. I hold professional licenses and certifications issued by the State of California for these practices and have over 30 years experience in these fields. My CV is attached.

The attached bibliography lists the documents I have reviewed prior to preparing this comment. This list includes: City of Pacifica, 2020, "Vista Mar Project Initial Study/ Mitigated Negative Declaration" (January 2020). I have also visited the project site located adjacent to 513 Monterey Road, Pacifica.

1-2 I have several areas of concern that lead me to conclude that this project is likely to result in significant adverse impacts to the environment. These significant adverse impacts include slope destabilization resulting from the raising of the water table, as well as erosion from fugitive groundwater seeps subsequent to an elevated water table. These impacts will occur even with the mitigations discussed or proposed.

1-3 These impacts are the probable outcome of the obstruction and diversion of normal groundwater flow resulting from the project. The project consists of excavating a crescent shaped wedge out of a hill slope below groundwater, then placing houses 10 feet below the water table. The wedge of earthen material has the approximate dimensions of 275 feet by 50 feet by 20 in height, and is most likely composed of loosely consolidated sediment along the steep slopes at the base of a natural valley. I mention only the probability of the excavated materials because the subsurface investigation has not been completed. The excavation penetrates more deeply than the only two borings done for the project.

Groundwater at the site is found 10 feet to 11 feet below the surface in the borings, and groundwater also surfaces as a spring in the valley. The Vista Mar

1-3 Cont'd

Townhouse structures will be built 20 feet below the existing land surface, and approximately 10 feet below the water table. Notably, the Initial Study did not identify the significance of groundwater levels relative to the project elevations. See Figure 1, attached, where I show graphically in two dimensions the groundwater levels relative to the proposed housing units. The figure shows groundwater elevations in two cross-sections at the project site in March 2002. The sections show that groundwater level is at 10 feet *above* ground floor level of house unit # 8 and groundwater is at 5 feet *above* ground floor level in house units #2 and #3.

In Figure 1, groundwater flow lines shown as curved arcs represent groundwater flow around a barrier or flow to a point of discharge on a slope such as the case of the excavation for the townhouses. It shows that a vertical barrier will not prevent groundwater from continuing to flow down slope by rising into the excavation. The graphic does not show velocities or changing pressure potential over time, consequently it does not show the mounding effect. This barrier will act as a dam and the water level will build upwards over a period of time as a result of the project.

The water level data in Figure 1 comes from borehole water levels reported as feet below ground surface in the Geoforensics 2002 investigation report. I've projected the water levels along contours of equal elevation relative to the ground surface from the two borings drilled at different elevations. This is the only groundwater measurement data from subsurface investigations - save for an October 2007 survey by Live Oaks Associates that noted groundwater surfacing in the valley as a spring. The section base graphics are from J.C. Engineering, 2020, "Vista Mar Development Townhouse Drawing Set."

1-4

In constructing the Vista Mar Townhouses with their retaining walls, a barrier to the normal flow of groundwater will be created. As a result, groundwater flowing downhill will form a mound behind and above the project causing the water table to rise. As a result of the project, the rising water table will contribute to slope instability by increasing the weight of the soil and by causing the loss of cohesive strength of the clay minerals as the soils adsorb water. Both factors will reduce the angle of repose of the sediments and thus reduce the stability of the hill slope.

The Initial Study fails to identify or discuss the significant impact of the magnitude of the flux of groundwater resulting from project excavation, or its potential effect on the project.

1-5

The Geoforensics 2002 geotechnical report suggests a mitigation to "prevent build-up of hydrostatic pressures behind all walls" consisting of a groundwater seepage collection system between the retaining wall and the walls of the houses. The 2002 report does not discuss the volume or rate of flow of groundwater. The proposed mitigation is not adequate to mitigate the probable

flow rate of groundwater into the site. I estimate that the project excavation could produce thousands of gallons per minute (gpm) of groundwater flow; in contrast, the proposed mitigation addresses less than 200 gpm. Thus, this proposed mitigation will not prevent the water table from rising.

Further, unless the project site is actively dewatered throughout the year, groundwater will rise into the excavation flowing from below the townhouse project. If the houses are sealed and made impermeable, they will be damaged as the groundwater rises displacing the houses. The effect is similar to a swimming pool drained of its water in an area with a high water table; in those cases groundwater lifts the swimming pool damaging the structure.

1-5 Cont'd

Additionally, if measures are taken to reinforce the house foundations, such as securing the houses to the ground by adding mass or attaching piers, and also sealing the houses to make them impermeable to the rising groundwater, the resulting rising water table will eventually surface as a seeps or springs. The resulting water will discharge either onto the townhouses driveway or around the sides of the houses, resulting in additional significant adverse impacts.

My conclusion of significant impacts is also based on the fact that the Initial Study neither contemplates altering the groundwater flow, nor does it address what impacts could occur by modifying the existing groundwater flow. Again, the Initial Study's evaluation of the project was done without identifying or discussing the magnitude of the groundwater flux or its potential effect on the project and the surrounding environment.

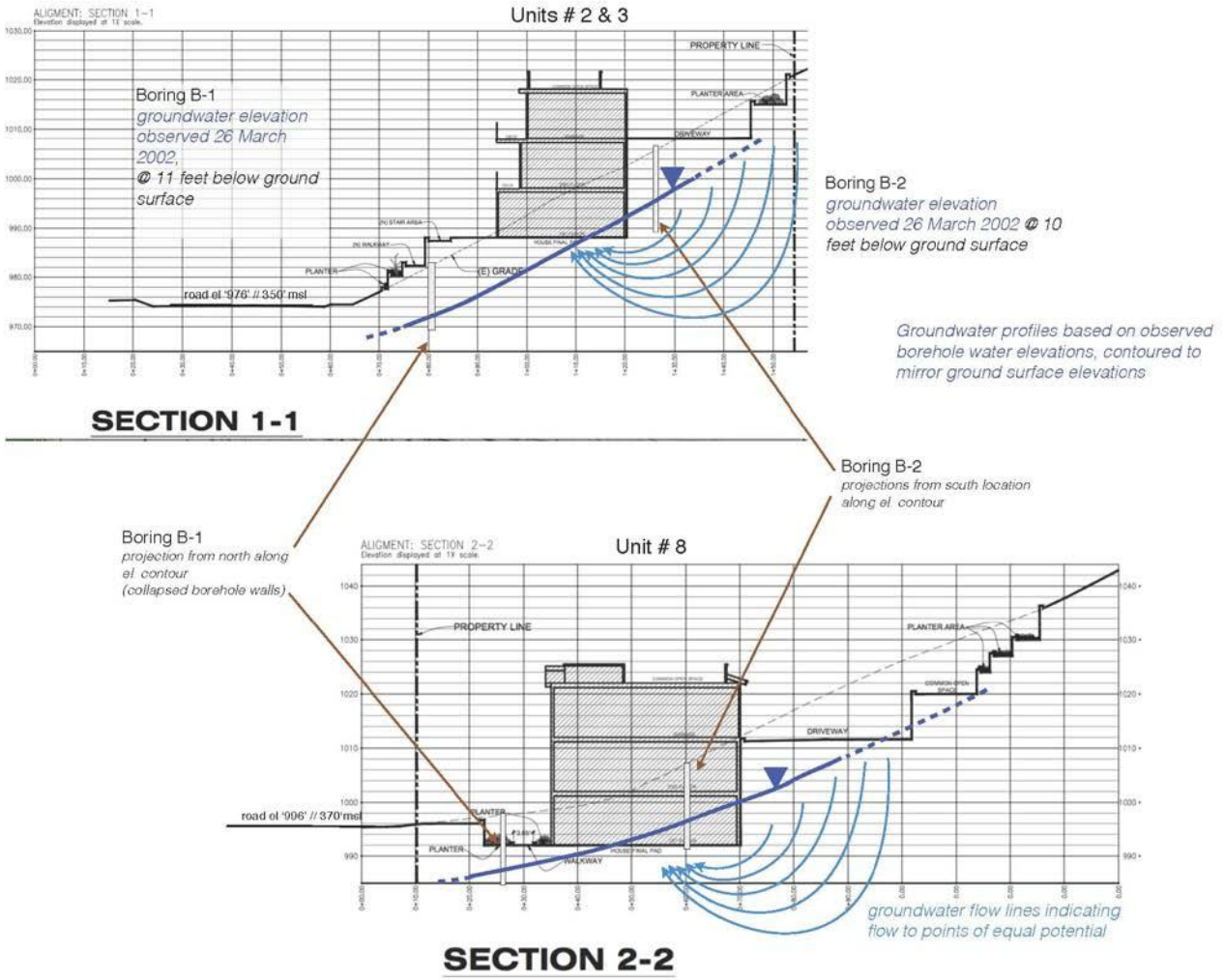
1-6

Additionally, my conclusion of significant impacts is based on the fact that the subsurface investigation - required to identify major geotechnical or geologic constraints potentially impacting the feasibility of the project - has not been completed. Additional notes on the inadequacy of this project's investigations are described in the 2019 Geocon Geotechnical Peer Review report.

Thank you for your attention to these issues.

Steven Bond PG, CEG CHG

Vista Mar Townhouses, Monterey Road, Pacifica, CA
Figure 1



Vista Mar Townhouses, Pacifica, CA Attachment 2

Bibliography of Reviewed Documents.

Beausoleil Architects, 2020, "Vista Mar Project Concerns", From: Robert and Christine Boles, Architects To: Bonny O'Connor, Project Planner Tina Wehrmeister, Planning Director Pacifica Planning Commission, (2 August 2020).

City of Pacifica, 2020, "Vista Mar Project Initial Study/ Mitigated Negative Declaration", (January 2020).

City of Pacifica, 2020, "Public Records Act Request", From: Sarah Coffey To: Brian Gaffney, (4 September 2020).

Gecon Consultants, Inc., 2019, "Proposed Vista Mar Townhome Development Monterey Road Pacifica, California Geotechnical Peer Review", From: Shane Rodacker, GE Senior Engineer To: Rod Stinson, (24 June 2019).

GeoForensics Inc., 2002, "Geotechnical Investigation for Proposed New Townhouses at Monterey Road", Pacifica, California, Vistamar Development, (29 April 2002).

GeoForensics Inc., 2014, "Monterey Townhouses Monterey Road Pacifica, California Geotechnical Report Update", From: Daniel F. Dyckman, PE, GE Senior Geotechnical Engineer, GE 2145 To: Miramar Enterprises, (2 September 2014).

GeoForensics Inc., 2019, "Monterey Townhouses Monterey Road Pacifica, California Response to Geotechnical Review Comments", From: Daniel F. Dyckman, PE, GE Senior Geotechnical Engineer, GE 2145 To: Javier Chavarria, (3 August 2019).

J.C. Engineering, 2020, "Vista Mar Development Townhouse Drawing Set", (18 August 2020).

Lowney Associates Environmental Geotechnical Engineering Services, 1998, "Supplemental Slope Repair Recommendations Lot 20 and 21 Pacific View Pacifica, California", From: Eric J. Swenson P.E., C.E.G. Associate Engineer and Geologist To: Ted Wasson, (1 April 1998).

Live Oak Associates, Inc., 2007, "Biological Constraints Analysis Vista Mar Property Pacifica, San Mateo County, California", (7 December 2007).

USGS, 1956, "San Francisco South Quadrangle California 7.5 Minute Series (Topographic) Map", (1956).

USGS, 1998, "Preliminary Geological Map of the San Francisco South 7.5' Quadrangle and Part pf the Hunters Point 7.5' Quadrangle, San Francisco Bay Area, California", M. G. Bonilla, (1998).

STEVEN R. BOND

Curriculum Vita

P. O. Box [redacted]
Santa Cruz California, USA 95061
[redacted]

Profile

Geologist / Engineering Geologist / Hydrogeologist / Aqueous-geochemist

- More than thirty years experience evaluating industrial impacts to ground and surface water quality and pollution treatment technologies.
- More than thirty years applied experience in groundwater and engineering geology.
- Twenty years practical experience defining hydrogeologic flow systems in crystalline, fractured rock systems, and porous sedimentary aquifers.
- More than thirty years practical experience evaluating natural and contaminant water chemistry issues.
- Twenty years practice of geochemical analysis of humid and semiarid hydrogeologic regimes, including water supply, and contaminant fate and transport.
- More than twenty years experience investigating and evaluating geologic and hydrogeologic hazards related to slope stability, seismic hazards, hazardous materials, mine wastes, and soil and groundwater contamination.
- More than fifteen years experience defining and modeling stream and river flow, flooding analyses, sediment transport systems, and rainfall distribution.
- Eleven years as a CA State regulator implementing California and U. S. water quality laws and regulations.

Professional Licenses	Professional Geologist, *California, USA*	# 5411
	Certified Engineering Geologist, *California, USA*	# 1841
	Certified Hydrogeologist, *California, USA*	# 0238

Professional Experience

January 1999 to Present

Steven Bond and Associates, Santa Cruz, CA, President, Principal Geologist

Conducted investigations and assessments of geologic hazards, threats to surface water and groundwater quality from various industrial and natural sources, and groundwater supply investigations. Performed litigation support in cases involving potential impacts of geologic hazards, groundwater supply and pollution, surface water pollution, and State water quality policy review. Examples of such activities and projects include the following:

- *Engineering Geology*: Conducted investigations of geologic hazards, foundation studies, liquefaction potential assessments, fault trace analyses, slope stability assessments and prepared the associated engineering geology investigation reports for development and industrial projects in Monterey, San Mateo, Mendocino, and Santa Cruz Counties. ◊ Conducted foundation suitability study, seismic evaluation, and fault trace study for resort development, Big Sur (Monterey Co.) ◊ Conducted analysis of debris-slide hazard potential of properties near Loma Mar (San Mateo Co.) ◊ Did technical analysis of slope stability and soil erosion potential of timber harvest operations, and evaluated surface-water monitoring practices (Humboldt Co.) for permitting dispute. ◊ Evaluated landslide activation hazard analysis of cliff side development in Brisbane (San Mateo Co.) ◊ Evaluated potential erosion hazards and drafted technical remedies from impacts of extrajudicial logging activities (Mendocino, Co.) ◊ Prepared engineering geologic reports for various residential development projects (Santa Cruz Co., San Mateo Co.).
- *Groundwater Investigations, Modeling, and Remediation System Design:* Designed and implemented original subsurface investigation technics, and remediation systems for a complex hydrogeologic environment of volcanic sediments, for Sierra Nevada Mt. community drinking water contamination (Volcano, CA). ◊ Did aquifer analysis and computer simulation (Modflow) of contaminant flow and remediation system design (groundwater extraction) for MTBE site in Turlock, CA. ◊ Did groundwater transport and pollutant fate analysis of landfill for litigation support (Colma, CA).

- *Surface Water and Groundwater Flow and Supply:* Conducted groundwater use sustainability study for a Sonoma Valley winery. ◊ Did evaluation of sustainability potential and impacts from groundwater extraction in Sierra Valley (Sierra and Plumas Counties) for litigation support. ◊ Water budget analysis for groundwater supply of coastal development (Big Sur). ◊ Analysis of flooding return, determine ordinary high water mark (Outlet Creek, Mendocino County) for litigation support. ◊ Conducted a comprehensive water budget analysis of the Mana Plain Watershed in western Kauai, HI for litigation support.
- *Policy Review and Regional Studies:* Conducted technical review and analysis of CA State water policy (State Implementation Plan, California Toxics Rule) for litigation support. ◊ Technical consultant and committee member for San Francisco Bay Copper-Nickel TMDL impairment studies (north and south). ◊ Conducted technical analysis of proposed monitoring and reporting programs for the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Central Valley Region, providing testimony before the before the Regional Board on behalf of stakeholders. ◊ Conducted technical analysis of rainfall distribution statistics and prepared comments on design storm standards for treatment control of BMP's in the California Statewide draft Industrial Storm Water Permit.
- *Storm Water:* Conducted technical reviews, and did litigation support in cases of storm water pollution regarding the adequacy of monitoring programs, BMPs, and treatment technology application (Alameda, Humboldt, Placer, Sacramento, San Joaquin, San Mateo, San Francisco, Monterey, Sonoma, Santa Cruz, and Yuba counties) for the following types of industry: aggregate, cement, asphalt, metal fabrication, metal forging, steel casting, scrap metal, recycling, ship breaking, wood treatment, sawmills, CAFO's, food processing, vehicle maintenance, auto wrecking, POTW, precious and heavy metal mines, landfills, fueling facilities, and port loading facilities for ammonia, fertilizer and petroleum coke.
- *Mining Projects:* Evaluated drinking water quality hazards posed to confined prisoners at an operating copper mine (United Nations ICTY, Bosnia-Herzegovina). ◊ Evaluated geochemical potential to produce acid and release arsenic from re-activated gold mine (Sutter Ck. CA), acid mine drainage water quality impacts. ◊ Evaluated WQ pollution potential from abandoned mercury and gold mines (Coastal Mts, central & north CA, Sierra Nev. Mts) for litigation purposes.
- *Land Discharge Projects:* Evaluated compliance with CCR Title 23, Title 22, Chapter 15 (CA) regulations for Winery wastes (Amador County), dredging spoils disposal (Port of Stockton), Class III landfill (San Mateo Co., Shasta Co., Lake Co.). Designed monitoring programs and budgets.

March 1998 - January 1999

Fall Creek Engineering, Inc., Santa Cruz, CA, Principal Geologist

Hydrologic and Groundwater Investigations: Evaluated the risk from surface and groundwater contamination to public groundwater supplies (Big Sur); performed computer simulations of flow and geochemistry of ground and surface water interaction using Modflow, Minteq. Did hydrologic studies to evaluate the flood stages, water surface profiles, and erosion potentials; constructed a computer-based hydraulic model of the river using HEC-RAS (Salinas River, Monterey Co.); prepared water quality and flood control management plans (Pajaro River). Designed and conducted soil and groundwater sampling analysis programs at various sites in Monterey and Santa Cruz Counties (luft and wastewater systems).

March 1997 - January 1998

Water For People, Denver Colorado, Consulting Hydrogeologist

Conducted a synoptic hydrogeological survey of the Bay Islands, Honduras, Central America for the Bay Island Environmental Project. Evaluated the islands' resources and prepared guidance for a comprehensive water supply investigation of the three main islands comprised primarily of fractured metamorphic rock. Conducted local interviews, literature review and a reconnaissance level survey, field trued geology in selected areas. Evaluated island-available drilling technology, characterized water quality and supply issues for several of the island communities, prepared investigative criteria for future work, wrote report.

December 1986 - May 1998

California Regional Water Quality Control Board, Sacramento, CA. Associate Engineering Geologist

Conducted investigations of all aspects of pollutant transport in the vadose zone and groundwater and surface water. Reviewed and evaluated the geologic, hydrogeologic, geochemical, and geophysical content of professional reports. Evaluated thoroughness of surface and groundwater investigations, the completeness of remedial efforts, and validity of monitoring programs. Provided expert technical assistance to State and local agencies on issues of geochemical fate and transport of pollutants, well-head protection strategies, abandoned mine investigation and remediation methods, and contaminated groundwater and soil cleanup technics. Examples of such projects include the following:

- Analysis of groundwater impacts from organic solvents and fuels in sedimentary and fractured rock terrain. Evaluated investigative methods including drilling techniques, soil, water, and vapor sampling methods, and in situ and ex-situ remedial technologies using vapor transport, groundwater capture, extraction and treatment. Did deterministic computer modeling. Technical advisor and regulator for hundreds of facilities under authority of Federal and State underground tank statutes in the counties of Alpine, Amador, El Dorado, Calaveras, Lake, Napa, Mariposa, Placer, Sierra, Solano, Stanislaus, and Tuolumne California, and in Yosemite National Park.
- Analysis of groundwater flow and pollutant transport characteristics of polluted, high density waste water (industrial acids and heavy-metals) at Davis, CA. Evaluated water quality impacts, effectiveness of groundwater extraction schemes using numerical modeling methodologies for flow, and chemical fate and transport. Co-developed in situ leaching methods of contaminated soils to accelerate cleanup rates.
- Analysis of the underlying, geochemical causes of acid mine drainage at the Penn Mine in Calaveras Co., CA. Identified and evaluated groundwater flow paths in a faulted crystalline-rock aquifer and the applicability of water quality and hazardous waste laws to the toxic discharges. Conducted a geologic and fracture mapping project and developed conceptual flow groundwater model. Evaluated acid-mine and acid-rock drainage remedial alternatives and made recommendations for their use. Developed and composed work plan for the investigation of fractured-rock hydrogeological transport, and aquatic geochemical fate of heavy metals from Penn Mine to the adjacent Camanche Reservoir. Authored numerous reports and a series of successful grant proposals, prepared annual budget and obtained funding for detailed groundwater and remedial waste rock investigations.
- In companion project to the above mine waste project, developed a conceptual model for the transport mechanisms of heavy-metal laden sediment in the Camanche water-supply reservoir, developed the conceptual methodology of investigation, and managed the project. Assembled a team of limnologists from the University of California at Davis and fluid mechanical engineers specializing in sediment re-suspension from University of California at Santa Barbara. Wrote a successful Federal Clean Lakes Grant proposal, and implemented the investigation at Camanche reservoir, California.

May 1986 - September 1986

U.S. Army Corps of Engineers, Sacramento, California, Engineering Geologist.

Conducted geologic and hydrogeologic investigations preparatory to the design of Deer Creek Water Supply Reservoir, Utah. Drafted groundwater investigation plan. Conducted geologic mapping. Designed monitoring wells, supervised drilling crews and well construction, conducted aquifer pumping tests.

October 1983 - September 1984

Dames and Moore, Los Angeles, California, Sedimentary Petrologist.

Conducted sedimentological investigation of near-shore sediments in western Arabian Gulf. Characterized sediment transport systems in the Arabian Gulf area of United Arab Emirates for Abu Dhabi National Oil Company.

May 1982 - April 1983

U.S. Army Corps of Engineers, Portland, Oregon, Engineering Geologist.

Conducted geologic, geophysical and hydrogeologic investigations in the Columbia Gorge near Bonneville, Oregon. Conducted geophysical borehole investigation of Bonneville New Navigation Lock. Did detailed mapping of landslides, and drill core logging. Designed passive de-watering systems, and monitoring wells. Supervised drilling and construction of water supply and monitoring wells; conducted and interpreted aquifer pumping tests.

June 1981 - December 1981

XCO, Denver Colorado, Petroleum Field Geologist

Did drill core logging, conducted field screening of chemical composition of drill cores, interpreted geologic strata, and prepared drilling reports in several depositional basins in North Dakota, Colorado, and Oklahoma.

September 1976 - September 1977

U. S. Geological Survey, Menlo Park, California. Geologic Field Assistant.

Conducted geologic mapping and did geochemical sampling for Continentally Unified Strategic Assessment Program which evaluated economic potential of proposed Federal Wilderness areas and abandoned mines. The region included the Kalmiopsis Wilderness of southwestern Oregon; an ophiolite suite and recent volcanic terrain.

Education & Training

Master of Science (ABT) in Hydrogeology, Special Studies Program, California State University, Chico, California, 1985-1986

Bachelor of Arts in Geology, Humboldt State University, California, 1979 - 1981

Annual NWWA courses in Aqueous Geochemistry, Fluid Flow through Fractured Rock, In situ Fluid Extraction Systems, Ground-Water Isotope Geochemistry. 1987-1991.

Computer Modeling. EPA CEAM: MINTEQ geochemical speciation, 1990, 1991; WASP surface water flow and transport, 1991. General Sciences Corp.: SESOIL vadose zone pollutant transport, 1994, 1996; AT 123D groundwater pollutant transport, 1994, 1996; NWWA: Visual Modflow, Flowtrans, groundwater flow and transport, 1996. WHI: Modflow 2000, MTD3, groundwater and contaminant transport, 2002.

Constructed Wetlands Workshop and Seminar Series, Humboldt State University, California, 2002.

Soil Slope Stabilization, Embankment Design, National Highway Institute, Vail, CO, 2007

40 hour OSHA Health and Safety for Hazardous Waste Operations and 8 hour refresher courses.

Professional Associations

Association of Engineering Geologists;
Groundwater Resources Association of California

Nonprofit Affiliations

Valley Air Trust, Central Valley, Stockton California, Board Member 1993 - 1997.
BayKeeper San Francisco Bay-Sacramento Delta, Technical Advisory Committee Member 1996 - present.
California Sportfishing Protection Alliance, Technical Advisory Committee Member 2000 - present
The Abandoned Mine Alliance, Sierra City, California, Board Member 2005 - present.
The Santa Cruz Flying Club, Watsonville, CA, Board Member 2009 - 2017.

Expert Testimony

- Before the United States District Court, District Of Hawai'I, concerning the Clean Water Act agricultural exemption involving mixed sources of polluted waters discharged to jurisdictional waters of the U.S., in the case of Na Kia'I Kai, Surfrider Foundation, and Pesticide Action Network North America, vs State Of Hawai'I Agribusiness Development Corporation, April 2019
- Before the United States Northern District Of California Court, on issues related to determination of the active channel and ordinary high water mark of a jurisdictional water of the U.S., in the case of Friends Of Outlet Creek vs Grist Creek Aggregates, Llc, October 2017
- Before the Superior Court of the State of California in and for the County of Alameda, on issues of water quality contamination by domestic garbage and litter in the case of Paul Ghysels, and Katy Ghysels, vs. Interfraternity Council, et al. December 2016.
- Before the United States Eastern District of California Court, on issues of selenium contamination transport in surface and groundwater from formerly irrigated lands to jurisdictional waters in the case of Pacific Coast Federation of Fishermen's Association; et al. vs U.S. Bureau of Reclamation and San Luis & Delta Mendota Water Authority, September 2015.
- Before the United States Eastern District of California Court, on issues of storm water pollutants associated with industrial scrap metal processing operations in the case of California Sport Fishing Protection Alliance vs Chico Scrap Metal, Inc., February 2015.
- Before the United States Eastern District of California Court, on issues of storm water pollutants associated with industrial structural metal fabrication in the case of California Sport Fishing Protection Alliance vs MCM Construction Inc., May 2014.
- Before the California Superior Court on issues of surface water pollution and recreational vehicle use at Carnegie State Park in the case of California Sport Fishing Protection Alliance et. al. vs California Department of Parks and Recreation Company, September 2009.
- Before the United States Northern District of California Court, on issues of storm water pollutants associated with industrial ammonia and urea fertilizer production and storage operations in the case of California Sport Fishing Protection Alliance vs California Ammonia Company, September 2006.
- Before the United States Northern District of California Court, on issues of surface water pollution associated with logging practices in the case of EPIC vs Pacific Lumber Company, May 2006.
- Before the United States Northern District of California Court, on issues of groundwater and storm water pollution associated with lumber milling and wood treatment operations in the case of Ecological Rights Foundation vs Sierra Pacific Industries, April, October, 2002.
- Before the United States Eastern California District Court, on issues of storm water pollution, confined animal feeding operations and industrial activities in the case of WaterKeeper of Northern CA. vs L. Vandhoef, Chancellor, University of California, Davis, June, August 2001.
- Before the CA State Water Resources Control Board hearing on the Appeal of Regional Water Quality Board's Actions regarding Pacific Lumber and the Elk Creek Timber Harvest Monitoring, July 2001.
- Before the United States Northern District of California Court, on issues of storm water pollution and ship-breaking in the case of WaterKeepers of Northern CA. et al. vs U.S. Dept. of Navy and Astoria Metals Corporation, June, August 2000.
- Before the California Superior Court on issues of groundwater pollution and crude oil in the case of Thompson Chevrolet vs Chevron Corporation et al., January, July, and November 1996.
- Before the California Superior Court on issues of acid mine drainage, water pollution, and groundwater flow through fractured crystalline rock in the case of California Sport Fishing Protection Alliance vs State Water Resources Control Board, June 1994.

- Before the California Senate Natural Resource and Wildlife Committee Investigative Hearing on Conflicts of Interest in the California Environmental Regulatory System, June 1992.
- Before the California Senate Natural Resource and Wildlife Committee Investigative Hearing on Acid Mine Drainage, Water Pollution, and the California Regulatory Environment, Jan. 1992.
- Before the California State Water Resources Control Board hearing on the Appeal of Regional Water Quality Boards Actions regarding the Penn Mine, October 1991.

Public Speaking and Presentations

Presentations before the State Water Resources and Regional Water Quality Control Boards.

- Presented testimony and briefs before the State and Regional Boards on specific cases of regulatory enforcement actions, policy enactment, and permit adoptions (1990 - 2011).
- Mediator of formal discussions between responsible parties regarding disputed technical issues involving groundwater quality (1988 - 1998).

Workshop Presentations before professional societies, and local and State regulatory agencies:

- The application and interpretation of discreet groundwater sampling methods and data collection.
- The use and interpretation of computer modeling simulations for vadose transport and mineral equilibria
- The effects and determination of vertical gradients on pollutant transport in groundwater.
- Contaminated soil cleanup criteria based on California State Water Code, regulations and policies.
- Acid Mine Drainage issues: the geology, mineralogy, and chemistry, the environmental effects, remediation, policies, and politics.

Writings

Author of scores of reports for private organizations, NGO's, Federal, State and local Agencies, on the subjects of (a. organic and inorganic pollutant transport in surface and groundwaters, (b. polluted groundwater remediation, (c. the investigation and analysis of the potential transport of soil contamination (metals, fuels, solvents) through the vadose zone, (d. unsaturated zone characterization including vapor-phase transport and cleanup technologies, (e. acid mine drainage causes, fate, and mitigation, (f. the logical elements of water quality monitoring, (g. regulatory compliance of state and federal environmental laws by federal, state and private parties, (h. metal mobility and mineral equilibria, (i. net-vertical transport of groundwater pollutants, (j. surface water and groundwater resource protection, (k. water budget accounting in mixed geologic environments with multiple density fluid interfaces, (l. groundwater supply evaluations, (m. reconciliation of threats to water resources and risks to human health, (n. engineering geology, geological hazard analysis, (o. rainfall distribution and design storm treatment objectives for storm water BMP's.

LETTER 1: STEVEN BOND, STEVEN BOND AND ASSOCIATES

Response to Comment 1-1

GeoForensics Inc., the consulting soil engineering firm that prepared the geotechnical investigation for the project reviewed the comment and provided responses to the letter submitted by Steven Bond and Associates. The responses prepared by GeoForensics Inc., are included in Appendix A of this document and presented in these Responses to Comments.

In response to the comments, GeoForensics Inc. notes that many of the assertions made are incorrect given the actual site conditions, data from site borings completed by GeoForensics Inc., and that the commenter uses erroneous assumptions and extrapolations to support their arguments. Further information regarding the actual site conditions and the commenter's specific concerns are provided below.

Response to Comment 1-2

The comment summarizes issues raised in-depth in the following comments. Responses to each issue raised by the commenter are provided below.

Response to Comment 1-3

The commenter claims that an "earthen wedge" of material which is to be excavated from the hillside to develop the project consists of loose sediment at the base of a natural valley. The commenter's analysis thus assumes the site is composed of loosely consolidated sediments. However, borings completed by GeoForensics Inc. indicated that while there are some loose materials in the drainage swale along the southern side of the property, the majority of the property consists of medium dense to dense surface soils over relatively shallow weathered bedrock. This broader portion of the project site was originally a moderately steep hillside which was cut down to permit the construction of Monterey Road, and is nowhere near the base of a natural valley (actually located approximately halfway up the mountain to State Route 35).

As there are two completely distinct areas of the property, to simply attribute ground water levels from the drainage swale, to the middle of a cut slope, is inappropriate. The commenter's diagram of a projected water table therefore shows a much steeper grade to the water table than actually exists on the site. The commenter then proposes that this incorrectly assumed steeper grade causes the proposed buildings to extend deeper below the water table. The commenter also provides that the project would also increase the water flow quantities that the commenter has "estimated". However, the consequence of assuming a steeper grade and greater water flow quantities is that the severity of perceived impacts is inaccurately increased beyond the level that would actually occur with implementation of the project.

Response to Comment 1-4

The proposed retaining walls are meant to provide slope stability but, contrary to the commenter's assertions, the retaining walls would not create a dam feature against the movement of groundwater downslope. Not only is the creation of a dam not intended as part of the project, but a structure designed sufficient to result in the damming of groundwater movement would be substantially more expensive than the type of retaining walls envisioned for the project. To avoid creation of a dam against groundwater movement, the retaining wall structures would be designed with standard drainage facilities to allow for continued movement of groundwater. Inclusion of such infrastructure would be far less costly than creation of a structure sufficient to act as a dam or complete impediment to the movement of groundwater. Thus, it is neither the intent of the design of the project nor a cost-effective approach to project implementation to construct a

retaining wall to act as a dam to the flow of groundwater. Considering the information provided in Response to Comment 1-3, as well as the lack of a proposed dam structure in the project, the project would not result in the creation of a dam that could affect the movement of groundwater in such a way as to create an adverse effect on the project. Thus, the commenter's concerns regarding potential impacts related to groundwater are speculative and are based on erroneous assumptions regarding project design.

Response to Comment 1-5

The commenter claims that the mitigation recommended by GeoForensics Inc. for any ground water is to place a "seepage collection system between the retaining wall and the walls of the houses". This is not correct. A drainage system would be provided upslope of the retaining wall (as per normal construction practices), and if warranted, the under-slab granular systems can also be fitted with collection pipes to intercept any water seepage that might attempt to bubble up under the buildings.

Based on the information presented in Responses to Comments 1-3 and 1-4, the commenter's estimation of groundwater flow is highly speculative and based on erroneous assumptions regarding the design of the proposed project and existing site conditions. With regard to existing site conditions, the commenter assumes that groundwater conditions across the entire site, including an existing cut slope, are identical to the conditions within the drainage swale, and further assumes a steeper grade to the water table than likely exists on-site. Both assumptions render the commenter's estimates of groundwater flow inaccurate. Because the commenter's estimate of groundwater flow form the basis of the commenter's conclusions, the commenter's conclusions regarding potential impacts are not justified.

Response to Comment 1-6

In June 2019, GEOCON Consultants Inc. performed a peer review of the technical reports prepared by GeoForensics Inc. and the project site plans. As noted in the GEOCON peer review, as well as GeoForensics Inc.'s response to the peer review, the Geotechnical Investigation and update prepared for the project by GeoForensics Inc. were only intended to identify major geotechnical or geologic constraints for the conceptual review of the proposed development of the site. GeoForensics Inc. acknowledged that further design-level analysis would be necessary to ensure such issues as slope stability are fully assessed and, if necessary, addressed. The IS/MND acknowledges the conceptual level of the GeoFrensics Inc. reports prepared to date through Mitigation Measures VII-1 through VII-4. Taken together, the mitigation measures require that a design-level geotechnical analysis be prepared and reviewed by the City of Pacifica Building Division. The design-level geotechnical analysis would include analyses of slope stability as well as design guidelines for the project to ensure that all impacts related to geology and soils are reduced to a less-than-significant level.

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

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September 16, 2020

Bonny O'Connor, Associate Planner
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Subject: Comments on Vista Mar Project (SCH No. 2020019032)

Dear Ms. O'Connor,

We have reviewed the January 2020 Initial Study – Mitigated Negative Declaration ("IS/MND") for the Vista Mar Project ("Project") located in the City of Pacifica ("City"). The Project proposes to construct four separate buildings, each with two attached townhomes, for a total of eight (8) residential dwelling units. Each structure would include a two-car garage, ranging from 1,592-SF to 1,869-SF. The Project also proposes to construct 2,500-SF of Common Open Space area and 11,000-SF of landscaping on the 1.2-acre Project site.

2-1 Soil Water Air Protection Enterprise ("SWAPE") specializes in estimating criteria air pollutant and greenhouse gas emissions ("GHG") released during construction and operational activities associated with proposed land use projects using CalEEMod. SWAPE also utilizes AERSCREEN air dispersion screening model to quantify health risk impacts associated with diesel particulate matter ("DPM") at sensitive receptor locations.

Our review concludes that the IS/MND fails to adequately evaluate the Project's air quality, health risk, and greenhouse gas impacts. As a result, emissions and health risk impacts associated with construction and operation of the proposed Project are underestimated and inadequately addressed. **Based on our updated modeling and screening-level health risk assessment, construction and operation of the Project could result in a potentially significant adverse health risk impact.** An EIR should be prepared to adequately evaluate the potential air quality, health risk, and greenhouse gas impacts that the project may have on the surrounding environment.

Air Quality Impacts

Unsubstantiated Input Parameters Used to Estimate Project Emissions

The IS/MND's air quality analysis relies on emissions calculated with CalEEMod.2016.3.2.[1] CalEEMod provides recommended default values based on site-specific information, such as land use type, meteorological data, total lot acreage, project type and typical equipment associated with project type. If more specific project information is known, the user can change the default values and input project-specific values, but the California Environmental Quality Act ("CEQA") requires that such changes be justified by substantial evidence.[2] Once all of the correct values are input into the model, the Project's construction and operational emissions are calculated, and "output files" are generated. These output files disclose what parameters were utilized in calculating the Project's air pollutant emissions and make known which default values were changed as well as provide justification for the values selected.[3]

2-2 As previously stated, the IS/MND's air quality analysis relies on air pollutant emissions calculated using CalEEMod. When we reviewed the Project's CalEEMod output files, provided in the Air Quality and Greenhouse Gas Modeling Results as Appendix A to the IS/MND, as discussed further below we found that several of the values input into the model were not consistent with information disclosed in the IS/MND. More specifically, the IS/MND's CalEEMod model fails to include all proposed land uses; includes unsubstantiated changes to the Project's architectural coating phase length, acres of grading values, number of hauling truck trips, CO_2 intensity factor, and fireplace values; and incorrectly includes several mobile-, energy-, and water-related operational mitigation measures. As a result, the IS/MND underestimates the proposed Project's construction and operational emissions and air quality impacts. An EIR should be prepared to adequately evaluate the air quality impacts that construction and operation of the Project will have on local and regional air quality.

Failure to Include All Proposed Land Uses

2-3 According to the IS/MND, the Project would include 3,462.88-SF of parking, 1,498.64-SF of private open space, and 3,904.07-SF of common open space, in addition to the 13,660.04-SF of residential space (p. 8, Table 1). However, review of the Project's CalEEMod output files demonstrates the model failed to include the proposed parking, private open space, and common open space land uses (see excerpt below) (Appendix A, pp. 90, 122, 149).

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	8.00	Dwelling Unit	1.20	14,400.00	23

[1] California Air Pollution Control Officers Associated ("CAPCOA") (November 2017) CalEEMod User's Guide, http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4.

[2] CAPCOA (November 2017) CalEEMod User's Guide, http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4, p. 1, 9.

[3] CAPCOA (November 2017) CalEEMod User's Guide, http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4, p. 11, 12 – 13. A key feature of the CalEEMod program is the "remarks" feature, where the user explains why a default setting was replaced by a "user defined" value. These remarks are included in the report.

2-3 Cont'd

As the table above demonstrates, the model omits the Project's proposed parking, private open space, and common open space land uses. This presents an impediment to accurately determining air quality impacts, as the land use type and size features are used throughout CalEEMod to determine default variable and emission factors that go into the model's calculations.[4] For example, the square footage of a land use is used for certain calculations such as determining the wall space to be painted (i.e., VOC emissions from architectural coatings) and volume that is heated or cooled (i.e., energy impacts). Furthermore, CalEEMod assigns each land use type with its own set of energy usage emission factors.[5] Thus, by failing to include the proposed parking, private open space, and common open space land uses, the model underestimates the Project's construction and operational emissions. By failing to include all proposed land uses, the CalEEMod model should not be relied upon to determine the significance of the Project's air quality impacts.

Unsubstantiated Changes to Architectural Coating Construction Phase Length

Review of the Project's CalEEMod output files demonstrates that the model included several manual changes to the Project's individual construction phase lengths (see table below) (Appendix A, pp. 91, 123, 150).

2-4

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	2.00	11.00
tblConstructionPhase	NumDays	4.00	44.00
tblConstructionPhase	NumDays	10.00	6.00
tblConstructionPhase	NumDays	200.00	305.00
tblConstructionPhase	NumDays	10.00	305.00

As a result, the model assumes a site preparation phase of 11 days, grading phase of 44 days, paving phase of 6 days, building construction phase of 305 days, and architectural coating phase of 305 days (see excerpt below) (Appendix A, pp. 95, 126, 153).

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days
1	Site Preparation	Site Preparation	4/1/2020	4/15/2020	5	11
2	Grading	Grading	4/16/2020	6/16/2020	5	44
3	Paving	Paving	6/17/2020	6/24/2020	5	6
4	Building Construction	Building Construction	6/25/2020	8/25/2021	5	305
5	Architectural Coating	Architectural Coating	7/9/2020	9/8/2021	5	305

As demonstrated in the tables above, the site preparation phase was increased by 450%, from the default value of 2 days to 11 days; the grading phase was increased by 1,000%, from the default value of 4 days to 44 days; the paving phase was decreased by 40%, from the default value of 10 days to 6 days;

[4] "CalEEMod User's Guide." CAPCOA, November 2017, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/upgrades/2016.3/01_user-39-s-guide2016-3-1.pdf?sfvrsn=2, p. 17

[5] "CalEEMod User's Guide, Appendix D." CAPCOA, September 2016, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/upgrades/2016.3/05_appendix-d2016-3-1.pdf?sfvrsn=2

the building construction phase was increased by approximately 53%, from the default value of 200 days to 305 days; and the architectural coating phase was increased by 2,950%, from the default value of 10 days to 305 days.

As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[6] According to the "User Entered Comments & Non-Default Data" table, the justification provided for these changes is: "applicant provided" (Appendix A, pp. 90, 122, 149). Furthermore, according to the IS/MND:

> "While the exact timing and length of each phase cannot be determined at this time, the following phase lengths have been assumed for the purposes of this analysis based on available project information:
>
> - Site preparation: two weeks;
> - Grading: two months;
> - Paving: one week; and
> - Building construction: 14 months" (p. 13).

2-4 Cont'd

Thus, the IS/MND provides the anticipated length of the site preparation, grading, paving, and building construction phases. However, *the IS/MND fails to justify the 2,950% increase to the architectural coating phase length or provide the anticipated length of the architectural coating phase length*. As a result, the revised architectural coating phase length is unsubstantiated. By spreading out architectural coating emissions over a 305-day, rather than the 10-day default period, maximum daily emissions associated with the architectural coating phase of construction are diluted and artificially reduced. Furthermore, according to the CalEEMod User's Guide, each construction phase is associated with different emissions activities (see excerpt below).[7]

> *Demolition* involves removing buildings or structures.
>
> *Site Preparation* involves clearing vegetation (grubbing and tree/stump removal) and removing stones and other unwanted material or debris prior to grading.
>
> *Grading* involves the cut and fill of land to ensure that the proper base and slope is created for the foundation.
>
> *Building Construction* involves the construction of the foundation, structures and buildings.
>
> *Architectural Coating* involves the application of coatings to both the interior and exterior of buildings or structures, the painting of parking lot or parking garage striping, associated signage and curbs, and the painting of the walls or other components such as stair railings inside parking structures.
>
> *Paving* involves the laying of concrete or asphalt such as in parking lots, roads, driveways, or sidewalks.

As such, by disproportionately altering the architectural coating phase length, without proper justification, the model's calculations are improperly altered. Thus, by including unsubstantiated changes to the Project's anticipated construction schedule phases, the model may underestimate the

[6] CalEEMod User Guide, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4, p. 2, 9

[7] "CalEEMod User's Guide." CAPCOA, November 2017, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4, p. 31.

2-4 Cont'd

Project's construction-related emissions and should not be relied upon to determine the significance of the Project's air quality impacts.

Unsubstantiated Change to Acres of Grading Values

Review of the Project's CalEEMod output files demonstrates that the default acres of grading values were manually reduced from 16.5-acres to 0.7-acres and from 5.5-acres to 0-acres in the model (see excerpt below) (Appendix A, pp. 91, 123, 150).

Table Name	Column Name	Default Value	New Value
tblGrading	AcresOfGrading	16.50	0.70
tblGrading	AcresOfGrading	5.50	0.00

2-5

As you can see in the excerpt above, the Project's anticipated acres of grading were manually reduced by approximately 96% and 100%, respectively. As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[8] According to the "User Entered Comments & Non-Default Data" table, the justification provided for these changes is: "applicant" (Appendix A, pp. 90, 122, 149).

Furthermore, the IS/MND states: "A total of 0.7 acres of land would be graded" (p. 24). Thus, the IS/MND attempts to justify this change based on the acreage of the grading site. However, according to the CalEEMod User's Guide:

> *"[T]he dimensions (e.g., length and width) of the grading site have no impact on the calculation, only the total area to be graded*. In order to properly grade a piece of land multiple passes with equipment may be required. The acres is based on the equipment list and days in grading or site preparation phase according to the anticipated maximum number of acres a given piece of equipment can pass over in an 8-hour workday" (emphasis added).[9]

[8] CalEEMod User Guide, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4, p. 2, 9

[9] "Appendix A Calculation Details for CalEEMod." *available at:* http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6, p. 9.

2-5 Cont'd

Thus, the justification provided by the IS/MND is insufficient because the dimensions of the grading site have no impact on the acres of grading value. In the absence of an explanation as to how the Project-specific equipment list and days of grading or site preparation phase would result in reduced acres of grading values, we cannot verify the revised acres of grading values. This presents an impediment to accurately determining air quality impacts, as the acres of grading value is used by CalEEMod to estimate the dust emissions associated with grading.[10] By including unsubstantiated changes to the acres of grading values, the model may underestimate the Project's construction-related emissions and should not be relied upon to determine the significance of the Project's air quality impacts.

Unsubstantiated Change to Hauling Truck Trip Number

Review of the Project's CalEEMod output files demonstrates that the default hauling truck trip number for the site preparation phase of construction was manually reduced from 13 to 12 trips (Appendix A, pp. 91, 123, 150).

2-6

Table Name	Column Name	Default Value	New Value
tblTripsAndVMT	HaulingTripNumber	13.00	12.00

As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[11] However, no justification was provided in the "User Entered Comments & Non-Default Data" table (Appendix A, pp. 90, 122, 149). Furthermore, the IS/MND and associated documents fail to mention or justify this change whatsoever. Thus, we cannot verify this change. This presents an impediment to accurately determining air quality impacts, as the number of hauling trips and associated vehicle miles traveled ("VMT") are used by CalEEMod to determine both the exhaust emissions associated with on-road vehicle use and fugitive dust emissions.[12] As a result, the model may underestimate the Project's construction-related emissions and should not be relied upon to determine Project air quality significance.

Unsubstantiated Change to Default CO_2 Intensity Factor

Review of the Project's CalEEMod output files demonstrates that the CO_2 intensity factor associated with the Project's utility company was manually reduced from the default value of 641.35 pounds per megawatt-hour ("lbs/MWh") to 269.5 lbs/MWh (see excerpt below) (Appendix A, pp. 91, 123, 150).

2-7

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5

As you can see in the excerpt above, the default CO_2 intensity factor was manually reduced by approximately 58%. As previously mentioned, the CalEEMod User's Guide requires any changes to

[10] "Appendix A Calculation Details for CalEEMod." *available at:* http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6, p. 9.
[11] CalEEMod User Guide, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4, p. 2, 9
[12] CalEEMod User Guide, Appendix A, p. 13, *available at:* http://www.caleemod.com/

model defaults be justified.[13] According to the "User Entered Comments & Non-Default Data" table, the justification provided for these changes is: "pg&e RPS" (Appendix A, pp. 90, 122, 149).

Furthermore, the IS/MND states:

> "The CO2 intensity factor was adjusted to reflect PG&E's progress towards the State renewable portfolio standards goal by the operational year (anticipated to be 2021)" (p. 24).

2-7 Cont'd

However, this justification is incorrect for three reasons. First, the justification fails to provide a source for the revised CO_2 intensity factor value and, as a result, we cannot verify the change. Second, just because the *state* has these *goals* for 2021 does not mean they will be achieved locally at the Project site. Third, using the *target* value for *2021* is incorrect, as any electricity use prior to 2021 would be underestimated. This unsubstantiated reduction presents an impediment to accurately determining air quality impacts, as CalEEMod uses the CO_2 intensity factor to calculate the Project's greenhouse gas ("GHG") emissions associated with electricity use.[14] Thus, by including an unsubstantiated reduction to the Project's anticipated CO_2 intensity factor, the model may underestimate the Project's GHG emissions and should not be relied upon to determine Project significance.

Unsubstantiated Changes to Fireplace Values

Review of the Project's CalEEMod output files demonstrates that the model includes two manual changes to the Project's default wood mass and number of wood fireplace value (Appendix A, pp. 91, 123, 150).

Table Name	Column Name	Default Value	New Value
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberWood	3.44	0.00

2-8

As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[15] According to the "User Entered Comments & Non-Default Data" table, the justification for these changes is: "applicant provided" (Appendix A, pp. 90, 122, 149). However, the IS/MND and associated documents fail to mention or justify these changes whatsoever, and as a result, we are unable to verify that they are correct. This presents an impediment to accurately determining air quality impacts, as CalEEMod uses the number of fireplaces to calculate the Project's area-source operational emissions.[16] As a result, the model may underestimate the Project's area-source operational emissions and should not be relied upon to determine Project significance.

[13] CalEEMod User Guide, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4, p. 2, 9
[14] "CalEEMod User's Guide." CAPCOA, November 2017, *available at:* http://www.caleemod.com/, p. 17.
[15] CalEEMod User Guide, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4, p. 2, 9
[16] "CalEEMod User's Guide." CAPCOA, November 2017, *available at:* http://www.caleemod.com/, p. 40.

Incorrect Application of Operational Mitigation Measures

Review of the Project's CalEEMod output files demonstrate that the model incorrectly includes several mobile-, energy-, and water-related operational mitigation measures. As a result, the Project's operational emissions may be underestimated, and the model should not be relied upon to determine Project air quality significance.

First, the Project's CalEEMod output files reveal that the model included the following two mobile-related operational mitigation measures: "Increase Transit Accessibility" and "Improve Pedestrian Network" (see excerpt below) (Appendix A, pp. 111, 142, 169).

4.1 Mitigation Measures Mobile

Increase Transit Accessibility
Improve Pedestrian Network

2-9

Second, the Project's CalEEMod output files reveal that the model included the following three energy-related operational mitigation measures: "Exceed Title 24," "Kilowatt Hours of Renewable Electricity Generated" and "Percent of Electricity Use Generated with Renewable Energy" (see excerpt below) (Appendix A, pp. 113, 144, 171).

5.1 Mitigation Measures Energy

Exceed Title 24
Kilowatt Hours of Renewable Electricity Generated
Percent of Electricity Use Generated with Renewable Energy

Third, the Project's CalEEMod output files reveal that the model included the following water-related operational mitigation measure: "Apply Water Conservation Strategy" (see excerpt below) (Appendix A, pp. 117, 147, 174).

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

However, the inclusion of the above-mentioned mobile-, energy-, and water-related operational mitigation measures is unsubstantiated. According to the CalEEMod User's Guide:

> "The mitigation measures included in CalEEMod are largely based on the CAPCOA Quantifying Greenhouse Gas Mitigation Measures (http://www.capcoa.org/wp-content/uploads/downloads/2010/09/CAPCOA-Quantification-Report-9-14-Final.pdf) document. The CAPCOA measure numbers are provided next to the mitigation measures in

2-9 Cont'd

CalEEMod to assist the user in understanding each measure by referencing back to the CAPCOA document."[17]

Review of CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures* document demonstrates that the IS/MND fails to substantiate several of the mitigation measures included in the model (see table below).

CAPCOA Measure Requirements	Vista Mar Inconsistency
CAPCOA's Quantifying Greenhouse Gas Mitigation Measures[18]	
Mobile Measures	
Measure LUT-5 Increase Transit Accessibility *"The use of transit results in a model shift and therefore reduced VMT...The project description should include, at a minimum, the following design features:* • *A transit station/stop with high-quality, high-frequency bus service located within a 5-10 minute walk (or roughly ¼ mile from stop to edge of development), and/or* ○ *A rail station located within a 20 minute walk (or roughly ½ mile from station to edge of development)* • *Fast, frequent, and reliable transit service connecting a high percentage of regional destinations* • *Neighborhood designed for walking and cycling"* % VMT = Transit * B, where: Transit = Increase in transit mode share B = Adjustments from transit ridership increase to VMT The following information needs to be provided by the Project Applicant: • Distance to transit station in project	As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[19] Here, however, no justification was provided in the "User Entered Comments & Non-Default Data" table. Furthermore, while the IS/MND states that "the nearest transit stop to the project site is located approximately 0.2-mile away at the Monterey Road and Beaumont Boulevard bus stop", the IS/MND fails to demonstrate fast, frequent, and reliable transit service connecting a high percentage of regional destinations and/or that the neighborhood is designed for walking and cycling, as is required in the measure (p. 77). Additionally, the IS/MND fail to discuss the % VMT based on the increase in transit mode share and adjustments from transit ridership increase to VMT, as is required by CAPCOA for this measure. As such, the inclusion of this **Measure LUT-5** is unsubstantiated, and thus the model should not be relied upon to determine Project air quality significance.

[17] "CalEEMod User's Guide." CAPCOA, November 2017, *available at:* http://www.caleemod.com/, p. 53.
[18] "Quantifying Greenhouse Gas Mitigation Measures." CAPCOA, August 2010, *available at:* http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.
[19] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 2, 9

2-9 Cont'd

Measure SDT-1 Improve Pedestrian Network *"Providing a pedestrian access network to link areas of the Project site encourages people to walk instead of drive. This mode shift results in people driving less and thus a reduction in VMT. The project will provide a pedestrian access network that internally links all uses and connects to all existing or planned external streets and pedestrian facilities contiguous with the project site. The project will minimize barriers to pedestrian access and interconnectivity."* Inputs: *"The project applicant must provide information regarding pedestrian access and connectivity within the project and to/from off-site destinations."*	As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[20] Here, however, no justification was provided in the "User Entered Comments & Non-Default Data" table. Furthermore, the IS/MND states that "the proposed project would include connection to the existing sidewalk along Monterey Road and access to the regional transit facilities, thereby providing for pedestrian and public transportation connectivity with the surrounding area" (p. 77-78). However, the IS/MND fails to demonstrate *with substantial evidence* that the Project will provide a pedestrian access network that internally links all uses and connects to all existing and planned external streets and pedestrian facilities contiguous with the Project site, as well as minimize barriers to pedestrian access and interconnectivity, as is required by CAPCOA for this measure. Furthermore, the IS/MND fails to adequately provide *substantial evidence* regarding pedestrian access and connectivity within the project and to/from off-site destinations. As such, the inclusion of **Measure SDT-1** is unsubstantiated, and thus the model should not be relied upon to determine Project air quality significance.
Energy Measures	
Measure BE-1 Exceed Title 24 *"Greenhouse gases (GHGs) are emitted as a result of activities in residential and commercial buildings when electricity and natural gas are used as energy sources. New California buildings must be designed to meet the building energy efficiency standards of Title 24, also known as the California Building Standards Code. Title 24 Part 6 regulates energy uses including space heating and cooling, hot water heating, and ventilation. By committing*	As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[21] Here, however, no justification was provided in the "User Entered Comments & Non-Default Data" table. While the IS/MND states that the "Project would exceed Title 24 by 15 percent," the IS/MND fails to provide the total electricity demand per dwelling unit or square feet, as is required by CAPCOA for the measure. Furthermore, the IS/MND fails to state *which* Title-24 Standards the Project will exceed,

[20] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 2, 9
[21] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 2, 9

2-9 Cont'd

to a percent improvement over Title 24, a development reduces its energy use and resulting GHG emissions." The following information needs to be provided by the Project Applicant: • Square footage of non-residential buildings • Number of dwelling units • Building/Housing Type • Climate Zone • Total electricity demand (KWh) per dwelling unit or per square feet • % reduction commitment (over 2008 Title 24 standards)	as there have been recent updates in 2019, 2016, and 2013, with the model using 2016 as default. In addition, the IS/MND fails to demonstrate that **Measure BE-1** will be implemented, monitored, and enforced locally on the Project site and as such, we are unable to verify **Measure BE-1** inclusion in the model. Thus, the IS/MND fails to demonstrate consistency with this measure pursuant to CAPCOA guidance, and its inclusion in the model is unsubstantiated.
Measure AE-1 Alternative Energy Generation *"Using electricity generated from renewable or carbon-neutral power systems displaces electricity demand which would ordinarily be supplied by the local utility."* The following information needs to be provided by the Project Applicant: • Total annual electricity demand (kWh) • Annual amount of electricity to be provided by the on-site power system (kWh) or percent of total electricity demand to be provided by the on-site power system (%) • Carbon intensity of local utility and on-site power system if not carbon neutral Baseline	As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified. [22] Here, however, no justification was provided in the "User Entered Comments & Non-Default Data" table. While the IS/MND states that "24kWh of on-site renewable energy would be used", the IS/MND fails to elaborate upon *what* renewable energy system would be included and how it would be implemented, monitored, and enforced locally on the Project site (p. 24). As such, we have no idea if this supposed "power system" will incorporate wind, solar, geothermal, or any other type of renewable energy that may not be feasible on the Project site. The IS/MND also fails to mention the annual amount of electricity to be provided by the on-site power system or the percent of total electricity demand to be provided by the on-site power system, as is required for the measure. Thus, the IS/MND fails to demonstrate consistency with this measure, and inclusion of **Measure AE-1** in the model is unsubstantiated.
Water Measures	

[22] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 2, 9

2-9 Cont'd

Measure WUW-2 Adopt a Water Conservation Strategy *"Water use contributes to GHG emissions indirectly, via the production of the electricity that is used to pump, treat, and distribute the water. Reducing water use reduces energy demand and associated indirect GHG emissions."* The following information needs to be provided by the Project Applicant: • Total expected water demand, without implementation of Water Conservation Strategy (million gallons) • Percent reduction in water use after implementation of Water Conservation Strategy (%)	As previously mentioned, the CalEEMod User's Guide requires any changes to model defaults be justified.[23] Here, however, no justification was provided in the "User Entered Comments & Non-Default Data" table. While the IS/MND states that "water conservation strategies would be applied to 30 percent of indoor and 60 percent of outdoor water use," the IS/MND fails to provide the total expected water demand or the percent reduction in *total* water use as a result of the application of this measure to 30 and 60 percent of use, respectively (p. 24). Thus, the IS/MND fails to demonstrate consistency with **Measure WUW-2**, and its inclusion in the model is unsubstantiated.

As you can see in the table above, the IS/MND fails to justify the mobile-, energy-, and water-related operational mitigation measures included in the Project's CalEEMod model. As a result, the inclusion of these measures in the model is unsubstantiated and the model should not be relied upon to determine Project air quality significance.

Health Risk Impacts

Diesel Particulate Matter Health Risk Emissions Inadequately Evaluated

The IS/MND concludes that the Project's health risk impacts would be less than significant, without conducting a quantified construction and operational health risk assessment ("HRA") (p. 30-31). Specifically, regarding health risk impacts from Project construction, the IS/MND states:

> "Due to the temporary nature of construction and the relatively short duration of potential exposure to associated emissions, the potential for any one sensitive receptor in the area to be exposed to concentrations of pollutants for a substantially extended period of time would be low. Therefore, construction of the proposed project would not be expected to expose nearby sensitive receptors to substantial pollutant concentrations" (p. 29).

2-10

Furthermore, regarding health risk impacts associated with Project operation, the IS/MND states:

> "The proposed townhouses would not involve any land uses or operations that would be considered major sources of TACs, including DPM. As such, the project would not generate any substantial pollutant concentrations during operations" (p. 28).

[23] CalEEMod User Guide, *available at:* http://www.caleemod.com/, p. 2, 9

2-10 Cont'd

However, the IS/MND's evaluation of the Project's health risk impacts, as well as the subsequent less than significant impact conclusion, is incorrect for three (3) reasons.

First, simply because the IS/MND claims that construction would be temporary and would result in a relatively short exposure duration does not justify the omission of a quantified construction HRA. By failing to prepare a quantified construction HRA, the IS/MND is inconsistent with the most recent guidance published by the Office of Environmental Health Hazard Assessment ("OEHHA"), the organization responsible for providing guidance on conducting HRAs in California. In February of 2015, OEHHA released its most recent *Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments*.[24] This guidance document describes the types of projects that warrant the preparation of an HRA. Construction of the Project will produce emissions of DPM, a human carcinogen, through the exhaust stacks of construction equipment over a construction period of approximately 18-months (p. 13). The OEHHA document recommends that all short-term projects lasting at least two months be evaluated for cancer risks to nearby sensitive receptors.[25] Therefore, per OEHHA guidelines, we recommend that an EIR be prepared to evaluate health risk impacts from Project construction.

Second, simply because the IS/MND claims that the Project would not involve land uses known to be common sources of toxic air contaminants ("TACs") does not justify the omission of a quantified operational HRA. Once construction of the Project is complete, the Project will operate for a long period of time. According to the IS/MND, Project operation will generate approximately 76 daily vehicle trips, which will generate additional exhaust emissions and continue to expose nearby sensitive receptors to DPM emissions (p. 77, Table 10). OEHHA's *Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments* recommends that exposure from projects lasting more than 6 months be evaluated for the duration of the project, and recommends that an exposure duration of 30 years be used to estimate individual cancer risk for the maximally exposed individual resident ("MEIR").[26] Even though we were not provided with the expected lifetime of the Project, we can reasonably assume that the Project will operate for at least 30 years, if not more. Therefore, we recommend that health risks from Project operation also should have been evaluated, as a 30-year exposure duration vastly exceeds the 2-month and 6-month requirements set forth by OEHHA. This guidance reflects the most recent health risk policy. We recommend that an assessment of health risks in accordance with OEHHA guidelines to nearby sensitive receptors from Project construction and operation be included in an EIR for the Project.

Third, by claiming a less than significant impact without conducting a quantified HRA to nearby, existing sensitive receptors as a result of Project construction and operation, the IS/MND fails to compare the

[24] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/hotspots2015.html
[25] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf, p. 8-18
[26] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf, p. 8-6, 8-15

2-10 Cont'd

excess health risk to the BAAQMD's specific numeric threshold of 10 in one million.[27] Thus, the IS/MND cannot properly conclude less than significant health risk impacts resulting from Project construction and operation without quantifying emissions to compare to the proper threshold.

Thus, in accordance with the most relevant guidance, an assessment of the health risk posed to nearby, existing receptors from Project construction and operation should have been conducted. In an effort to demonstrate the potential risk posed by the Project to nearby sensitive receptors, we prepared a simple screening-level construction and operational HRA. The results of our assessment, as described below, demonstrate that construction and operational DPM emissions may result in a potentially significant health risk impact that was not previously identified and evaluated within the IS/MND.

Screening-Level Analysis Demonstrates Significant Impacts

To evaluate the potential health risk impacts posed by Project construction and operation to nearby existing sensitive receptors, we prepared a screening-level HRA utilizing site-specific emissions estimates. The results of our assessment, as described below, demonstrate that the proposed Project would result in a potentially significant adverse health risk impact not previously identified or addressed by the IS/MND.

2-11

In order to conduct our screening-level risk assessment we relied upon AERSCREEN, which is a screening level air quality dispersion model.[28] The model replaced SCREEN3, and AERSCREEN is included in the OEHHA[29] and the California Air Pollution Control Officers Associated ("CAPCOA")[30] guidance as the appropriate air dispersion model for Level 2 health risk screening assessments ("HRSAs"). A Level 2 HRSA utilizes a limited amount of site-specific information to generate maximum reasonable downwind concentrations of air contaminants to which nearby sensitive receptors may be exposed. If an unacceptable air quality hazard is determined to be possible using AERSCREEN, a more refined modeling approach is required prior to approval of the Project.

In an effort to accurately determine the emissions associated with the Project, we prepared an updated CalEEMod model, using the Project-specific information provided by the IS/MND. In our updated model, we: included all proposed land uses; omitted the unsubstantiated changes to the architectural coating phase length, acres of grading values, hauling truck trip number, default CO_2 intensity factor, fireplace values; and removed the unsubstantiated operational mitigation measures. Based on the annual PM_{10} exhaust estimates from the SWAPE CalEEMod output files, provided as Attachment 1 to this letter, we prepared a preliminary HRA of the Project's construction and operational health-related impact to residential sensitive receptors. Consistent with recommendations set forth by OEHHA, we assumed residential exposure begins during the third trimester stage of life. SWAPE's CalEEMod model indicates

[27] "California Environmental Quality Act Air Quality Guidelines." BAAQMD, May 2017, *available at:* http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en
[28] U.S. EPA (April 2011) AERSCREEN Released as the EPA Recommended Screening Model, http://www.epa.gov/ttn/scram/guidance/clarification/20110411_AERSCREEN_Release_Memo.pdf
[29] OEHHA (February 2015) Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments, https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf.
[30] CAPCOA (July 2009) Health Risk Assessments for Proposed Land Use Projects, http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf.

2-11 Cont'd

that construction activities will generate approximately 153 pounds of DPM over the 525-day construction period. The AERSCREEN model relies on a continuous average emission rate to simulate maximum downward concentrations from point, area, and volume emission sources. To account for the variability in equipment usage and truck trips over Project construction, we calculated an average DPM emission rate by the following equation:

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{152.8\ lbs}{525\ days} \times \frac{453.6\ grams}{lbs} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} = \mathbf{0.001528\ g/s}$$

Using this equation, we estimated a construction emission rate of 0.001528 grams per second ("g/s"). Subtracting the 525-day construction period from the total residential duration of 30 years, we assumed that after Project construction, the sensitive receptor would be exposed to the Project's operational DPM for an additional 28.56 years, approximately. The Project's operational CalEEMod emissions, calculated by subtracting the existing emissions from the proposed Project, indicate that operational activities will generate approximately 24 pounds of DPM per year throughout operation. Applying the same equation used to estimate the construction DPM rate, we estimated the following emission rate for Project operation:

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{24.4\ lbs}{365\ days} \times \frac{453.6\ grams}{lbs} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} = \mathbf{0.000351\ g/s}$$

Using this equation, we estimated an operational emission rate of 0.000351 g/s. Construction and operational activity was simulated as a 1.2-acre rectangular area source in AERSCREEN with dimensions of 81 by 60 meters. A release height of three meters was selected to represent the height of exhaust stacks on operational equipment and other heavy-duty vehicles, and an initial vertical dimension of one and a half meters was used to simulate instantaneous plume dispersion upon release. An urban meteorological setting was selected with model-default inputs for wind speed and direction distribution.

The AERSCREEN model generates maximum reasonable estimates of single-hour DPM concentrations from the Project site. EPA guidance suggests that in screening procedures, the annualized average concentration of an air pollutant be estimated by multiplying the single-hour concentration by 10%.[31] While the closest residential sensitive receptor is located less than 5 meters away, the MEIR is located approximately 50 meters from the Project site, according to AERSCREEN. The single-hour concentration estimated by AERSCREEN for Project construction is approximately 7.395 µg/m^3 DPM at approximately 50 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.7395 µg/m^3 for Project construction at the MEIR. For Project operation, the single-hour concentration estimated by AERSCREEN is 1.698 µg/m^3 DPM at approximately 50 meters downwind. Multiplying this single-hour concentration by 10%, we get an annualized average concentration of 0.1698 µg/m^3 for Project operation at the MEIR.

[31] "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources Revised." EPA, 1992, *available at*: http://www.epa.gov/ttn/scram/guidance/guide/EPA-454R-92-019_OCR.pdf; *see also* "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf p. 4-36.

2-11 Cont'd

We calculated the excess cancer risk to the MEIR using applicable HRA methodologies prescribed by OEHHA, as referenced by the IS/MND. In our updated CalEEMod model, we utilized the construction schedule proposed in the IS/MND and left the default architectural coating phase length, as this phase was not addressed in the IS/MND (p. 15). Consistent with this schedule, the annualized average concentration for construction was used for the entire third trimester of pregnancy (0.25 years) and the first 1.19 years of the infantile stage of life (0 – 2 years). The annualized averaged concentration for operation was used for the remainder of the 30-year exposure period, which makes up the remainder of the infantile stage of life, and the entire child and adult stages of life (2 – 16 years) and (16 – 30 years), respectively.

Consistent with OEHHA, as recommended by SCAQMD, BAAQMD, and SJVAPCD guidance, we used Age Sensitivity Factors ("ASFs") to account for the heightened susceptibility of young children to the carcinogenic toxicity of air pollution.[32, 33, 34, 35] According to this guidance, the quantified cancer risk should be multiplied by a factor of ten during the third trimester of pregnancy and during the first two years of life (infant) as well as multiplied by a factor of three during the child stage of life (2 – 16 years) (Appendix A, pp. 23). Furthermore, in accordance with the guidance set forth by OEHHA, we used the 95th percentile breathing rates for infants.[36] Finally, according to BAAQMD guidance, we used a Fraction of Time At Home ("FAH") value of 0.85 for the 3rd trimester and infant receptors, 0.72 for child receptors, and 0.73 for the adult receptors.[37] We used a cancer potency factor of 1.1 (mg/kg-day)$^{-1}$ and an averaging time of 25,550 days. The results of our calculations are shown below.

The Maximally Exposed Individual at an Existing Residential Receptor

[32] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf.
[33] "Draft Environmental Impact Report (DEIR) for the Proposed The Exchange (SCH No. 2018071058)." SCAQMD, March 2019, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2019/march/RVC190115-03.pdf?sfvrsn=8, p. 4.
[34] "California Environmental Quality Act Air Quality Guidelines." BAAQMD, May 2017, *available at:* http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en, p. 56; see also "Recommended Methods for Screening and Modeling Local Risks and Hazards." BAAQMD, May 2011, *available at:* http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20Modeling%20Approach.ashx, p. 65, 86.
[35] "Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document." SJVAPCD, May 2015, *available at:* https://www.valleyair.org/busind/pto/staff-report-5-28-15.pdf, p. 8, 20, 24.
[36] "Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics 'Hot Spots' Information and Assessment Act," June 5, 2015, *available at:* http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588-risk-assessment-guidelines.pdf?sfvrsn=6, p. 19.
"Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf
[37] "Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines." BAAQMD, January 2016, *available at:* http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/workshops/2016/reg-2-5/hra-guidelines_clean_jan_2016-pdf.pdf?la=en

2-11 Cont'd

Activity	Duration (years)	Concentration (ug/m3)	Breathing Rate (L/kg-day)	Cancer Risk without ASFs*	ASF	Cancer Risk with ASFs*
Construction	0.25	0.7395	361	8.5E-07	10	8.5E-06
3rd Trimester Duration	***0.25***			***8.5E-07***	***3rd Trimester Exposure***	***8.5E-06***
Construction	1.19	0.7395	1090	1.2E-05	10	1.2E-04
Operation	0.81	0.1698	1090	2.3E-06	10	1.9E-05
Infant Exposure Duration	***2.00***			***1.5E-05***	***Infant Exposure***	***1.4E-04***
Operation	14.00	0.1698	572	1.5E-05	3	4.4E-05
Child Exposure Duration	***14.00***			***1.5E-05***	***Child Exposure***	***4.4E-05***
Operation	14.00	0.1698	261	6.8E-06	1	6.8E-06
Adult Exposure Duration	***14.00***			***6.8E-06***	***Adult Exposure***	***6.8E-06***
Lifetime Exposure Duration	**30.00**			**3.7E-05**	**Lifetime Exposure**	**2.0E-04**

* We, along with CARB and BAAQMD, recommend using the more updated and health protective 2015 OEHHA guidance, which includes ASFs.

As demonstrated in the table above, the excess cancer risk to adults, children, infants, and during the 3rd trimester of pregnancy at the MEIR located roughly 50 meters away, utilizing age sensitivity factors, over the course of Project construction and operation, are approximately 6.8, 44, 140, and 8.5 in one million, respectively. The excess cancer risk over the course of a residential lifetime (30 years), utilizing age sensitivity factors, is approximately 200 in one million. **The infant, child, and lifetime cancer risks all exceed the BAAQMD threshold of 10 in one million, thus resulting in a potentially significant adverse health risk impact not previously addressed or identified by the IS/MND**. Results without age sensitivity factors are presented in the table above, although we **do not** recommend utilizing these values for health risk analysis. Regardless, the excess cancer risk posed to adults, children, infants, and during the third trimester of pregnancy at the MEIR, located approximately 50 meters away, over the course of Project construction and operation, without age sensitivity factors, are approximately 6.8, 15, 15, and 0.85 in one million, respectively. The excess cancer risk over the course of a residential lifetime (30 years) at the MEIR, without age sensitivity factors, is approximately 37 in one million. **The infant, child, and lifetime construction and operational cancer risks, without using age sensitivity factors, all exceed the BAAQMD threshold of 10 in one million, thus resulting in a potentially significant adverse health risk impact not previously addressed or identified by the IS/MND**. While we recommend the use of age sensitivity factors, health risk impacts exceed the BAAQMD threshold regardless.

2-11 Cont'd

An agency must include an analysis of health risks that connects the Project's air emissions with the health risk posed by those emissions. Our analysis represents a screening-level HRA, which is known to be conservative and tends to err on the side of health protection. The purpose of the screening-level construction and operational HRA shown above is to demonstrate the link between the proposed Project's emissions and the potential health risk. **Our screening-level HRA demonstrates that construction and operation of the Project could result in a potentially significant adverse health risk impact, when correct exposure assumptions and up-to-date, applicable guidance are used**. Therefore, since our screening-level construction HRA indicates a potentially significant impact, an EIR should include a reasonable effort to connect the Project's air quality emissions and the potential health risks posed to nearby receptors. Thus, an EIR should include a quantified air pollution model as well as an updated, quantified refined health risk assessment which adequately and accurately evaluates health risk impacts associated with both Project construction and operation.

Greenhouse Gas Impacts

Failure to Adequately Evaluate Greenhouse Gas Impacts

2-12

The IS/MND estimates that the Project would generate annual construction-related greenhouse gas ("GHG") emissions of 381.27 metric tons of CO_2 equivalents per year ("MT CO_2e/year") and operational GHG emissions of 94.58 MT CO_2e/year. As a result, the IS/MND concludes that the Project's GHG emissions would not exceed the BAAQMD bright-line threshold of 1,100 MT CO_2e/year (p. 53-54). Furthermore, the IS/MND relies upon the Project's consistency with the City of Pacifica Climate Action Plan ("CAP") in order to conclude that the Project would have a less than significant GHG impact (p. 52). However, the IS/MND's GHG analysis, as well as the subsequent less than significant impact conclusion is incorrect for three (3) reasons:

(1) The IS/MND's GHG analysis relies upon an incorrect and unsubstantiated air model;
(2) The IS/MND's GHG analysis relies upon an outdated threshold; and
(3) The IS/MND's reliance on the City's CAP is incorrect.

1) Incorrect and Unsubstantiated Air Model

2-13

As discussed above, the IS/MND concludes that the proposed Project would generate construction-related GHG emissions of 381.27 MT CO_2e/year and operational emissions of 94.58 MT CO_2e/year, which would not exceed the BAAQMD bright-line threshold of 1,100 MT CO_2e/year. However, the IS/MND's quantitative GHG analysis is unsubstantiated. As previously discussed, when we reviewed the Project's CalEEMod output files, provided as Appendix A to the IS/MND, we found that several of the values inputted into the model are not consistent with information disclosed in the IS/MND and associated documents. More specifically, the IS/MND's CalEEMod model fails to include all proposed land uses; includes unsubstantiated changes to the Project's architectural coating phase length, acres of grading values, number of hauling truck trips, default CO_2 intensity factor, and fireplace values; and incorrectly includes several mobile-, energy-, and water-related operational mitigation measures. As a result, the model underestimates the Project's GHG emissions, and the IS/MND's quantitative GHG analysis should not be relied upon to determine Project significance. An EIR should be prepared that

2-13 Cont'd

adequately assesses the potential GHG impacts that construction and operation of the proposed Project may have on the surrounding environment.

2) Incorrect Reliance on an Outdated Threshold

2-14

As discussed above, the IS/MND relies upon the BAAQMD's 2020 bright-line threshold of 1,100 MT CO_2e/year. However, this threshold is outdated and inapplicable to the proposed Project, as it was developed for the air district's planned reductions for 2020, based on AB 32. [38] Thus, this threshold only applies to projects that will become operational by the year 2020. Given that it is already September 2020, the Project has not yet been approved, and construction is expected to last approximately 18 months, we can reasonably assume that the Project will not become operational until *after the year 2020*. As such, the BAAQMD's 2020 bright-line threshold of 1,100 MT CO_2e/year is inapplicable to the proposed Project. We recommend that the Project utilize the widely-used 2030 substantial progress bright-line threshold of 660 MT CO_2e/year based on the GHG reduction goals of EO B-30-15.[39] We recommend that an EIR be prepared to include updated modeling with correct input parameters and compare the Project's estimated GHG emissions to the 2030 substantial progress bright-line threshold of 660 MT CO_2e/year.

3) Failure to Demonstrate Consistency with the City's CAP

As previously discussed, the IS/MND relies upon the Project's consistency with the City's CAP to determine the significance of the Project's GHG impact. Specifically, according to the IS/MND:

> "Because the proposed project would be consistent with the CAP's reduction measures and with the project site's existing General Plan land use designation, the project would be consistent with the GHG inventory contained in the CAP. Based on the above, the proposed project would not be considered to generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs; and impacts would be considered less than significant" (p. 52).

2-15

However, the IS/MND's reliance on the City of Pacifica CAP is incorrect, as the CAP is outdated and inapplicable to the proposed Project. Specifically, according to the City of Pacifica CAP:

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[38] "California Environmental Quality Act Air Quality Guidelines." BAAQMD, May 2017, *available at:* http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en, p. D-20 – D-22.

[39] See: "SOLAR4AMERICA ICE FACILITY EXPANSION AIR QUALITY AND GREENHOUSE GAS EMISSION ASSESSMENT." City of San Jose, September 2019, *available at:* https://www.sanjoseca.gov/Home/ShowDocument?id=45200, p. 6; "CASTRO VALLEY MEDICAL OFFICE BUILDINGS AIR QUALITY, HEALTH RISK & GREENHOUSE GAS ASSESSMENT." City of Castro Valley, April 2019, *available at:* http://www.acgov.org/cda/planning/documents/AttA-AirQuality.pdf, p. 23; "TO 20-01 PAPÉ MACHINERY AIR QUALITY & GREENHOUSE GAS EMISSIONS ASSESSMENT." City of Fremont, February 2020, *available at:* https://www.fremont.gov/DocumentCenter/View/44974/4_Appendix-1_Air-Quality-GHG-Assessment, 18; and "MIDPEN DOWNTOWN SAN MATEO OPPORTUNITY SITES AIR QUALITY & GREENHOUSE GAS ASSESSMENT." City of San Mateo, January 2020, *available at:* https://www.cityofsanmateo.org/DocumentCenter/View/81117/Appendix-A---Air-Quality-and-GHG-Assessment?bidId=, p. 6.

2-15 Cont'd

> "The preceding chapters describe the principal sources of the city of Pacifica's GHG emissions and outline related *goals and measures to achieve the community's emissions reduction targets to 35 percent below 2005 levels by 2020*. This chapter outlines the main components of the process for turning this plan into action and recommends specific actions from earlier chapters for implementation... Therefore, all measures must be implemented by 2020" (emphasis added).[40]

As you can see in the excerpt above, the City of Pacifica CAP only contains goals and measures to achieve GHG reductions through the year 2020. However, given that it is already September 2020, the Project has not yet been approved, and construction is expected to last approximately 18 months, we can reasonably assume that the Project will not become operational until *after the year 2020*. As such, the City of Pacifica CAP, which does not contain reduction goals beyond 2020, is inapplicable to the proposed Project. As a result, **the IS/MND's reliance on the City of Pacifica CAP is incorrect, and the IS/MND's less than significant impact determination regarding the CAP should not be relied upon.**

Sincerely,

Matt Hagemann, P.G., C.Hg.

Paul E. Rosenfeld, Ph.D.

Attachments:

Attachment 1:	SWAPE Project CalEEMod Modeling
Attachment 2:	SWAPE Project AERSCREEN Modeling
Attachment 3:	Paul Rosenfeld CV
Attachment 4:	Matt Hagemann CV

[40] "City of Pacifica Climate Action Plan." City of Pacifica, July 2014, available at: https://www.cityofpacifica.org/civicax/filebank/blobdload.aspx?blobid=7490, p. 57.

LETTER 2: MATT HAEGMAN & PAUL E. ROSENFELD, SWAPE

Response to Comment 2-1

The comment letter begins with a summary of the proposed project as well as SWAPE's approach to analysis. SWAPE also summarizes the conclusions of their review by alleging "that the IS/MND fails to adequate evaluate the Project's air quality, health risk, and greenhouse gas impacts." As shown in the detailed responses below, SWAPE's allegation is incorrect and is not supported by the analysis presented in their letter. Thus, the analysis presented within the IS/MND is adequate and, as discussed in depth within the IS/MND, preparation of an EIR is not warranted for the proposed project.

Response to Comment 2-2

The comment provides background information related to CalEEMod. Similar information is presented on page 24 of the IS/MND. As noted in the IS/MND and in the comment, CalEEMod includes various default values for project characteristics and emissions calculation methodologies. Where the default values are not applicable, for instance if the model overestimates the site acreage for the project, or the model uses a different trip rate, the user should input project-specific information. Where changes to the default values are applied, users should explain the changes. Page 24 provides a summary of the changes applied to CalEEMod, and further information is provided in Appendix A to the IS/MND. The information provided within the text of the IS/MND and in Appendix A provide sufficient explanation for changes to the default values in CalEEMod. Although the CalEEMod user guide directs users to justify changes from default values, it is important to note that the CEQA statute or guidelines do not include any such conclusions or directions specific to the CalEEMod software. Thus, the commenter's assertion that CEQA specifically requires that changes to CalEEMod be justified is not necessarily accurate, and the information cited in the footnote used to support this assertion does not include any specific mention of CEQA requirements related to CalEEMod.

Nevertheless, specific assumptions related to the modeling prepared for the project were presented on page 24, and within the Project Description portion of the IS/MND (pages 5 through 14). Upon review of the information available in the IS/MND, the values input into the model can be seen to be internally consistent and based on project-specifications or compliance with uniformly applicable regulatory requirements. Further information regarding each specific input parameter brought into question by the commenter can be found in the subsequent comments.

Based on the information provided in response to the comments below, only minor revisions are needed to clarify the analysis presented within the IS/MND and the conclusions of the IS/MND remain accurate. Therefore, preparation of an EIR is not required.

Response to Comment 2-3

As noted on page 8 of the IS/MND, the proposed project consists of development of eight townhouses across four separate buildings, with supporting landscaping and parking. The terms "private open space" and "common open space", as used on page 8 of the IS/MND, are meant to refer to areas such as decks or patios that are attached to individual units, or landscaped areas within the project site that are shared between multiple units. In both cases, "open space" refers to outdoor areas that are accessory to, and combined with, the residential use. Considering the nature of such areas, inclusion of such spaces as separate land uses is not required because CalEEMod inherently accounts for landscaped areas as part of single-family developments. Similarly, the CalEEMod user guide specifically states that parking areas for single-family land uses need not be applied as a separate land use, as CAlEEMod inherently accounts for parking

areas as a portion of the overall site acreage for residential uses. The following excerpt from the CalEEMod user guide supports the approach taken in the modeling prepared for the IS/MND:

> CalEEMod specifically designates parking areas as a separate land use rather than as a part of an associated non-residential land use (e.g., commercial buildings, retail facilities, etc.). However, no separate parking land use for a driveway or garage needs to be identified for residential land uses because parking is already included in the calculation. For more information on how CalEEMod treats parking based on the footprint and lot acreage of residential and non-residential land uses, please refer to the following figure. As depicted, the lot acreage of a residential land use includes the parking and building footprint. For non-residential land uses, the lot acreage is the same as the building footprint, so parking needs to be entered as a separate land use.[1]

The CalEEMod User Guide includes a figure to illustrate the foregoing direction, and the figure is reproduced as Figure 1 below. As demonstrated in the quoted text above and in Figure 1, the CalEEMod user guide explicitly states that parking areas should not be included as separate land uses and that the CalEEMod calculation methodology accounts for landscaped areas as part of single-family land uses. In accordance with the foregoing CalEEMod guidance, the lot acreage for the project site was adjusted to encompass the entire project site, allowing CalEEMod to incorporate areas of the site that would be used for the proposed parking garages and landscaping.

Considering the direction provided by the CalEEMod User Guide, the emissions modeling prepared for the proposed project uses the correct land uses and site acreage, and, thus, provides an accurate estimate of project-related emissions, which were subsequently used in the analysis presented in the IS/MND.

Response to Comment 2-4

Construction information, including the length of construction phases, was provided by the project applicant. The CalEEMod User Guide provides information related to the use of project-specific or default construction phase lengths as follows:

> The construction tabs/sub-screens contain default information that was obtained from a survey of construction sites conducted by South Coast Air Quality Management District (SCAQMD). The construction survey data is grouped by construction phase and lot acreage and can be found in Appendix E1. The default construction equipment list and phase length data were determined to be the most appropriate for the size and types surveyed. In addition, some data in the survey was extrapolated to create default values for project sizes that were not in the survey. However, if the user has more detailed site-specific equipment and phase information, the user should override the default values.[2]

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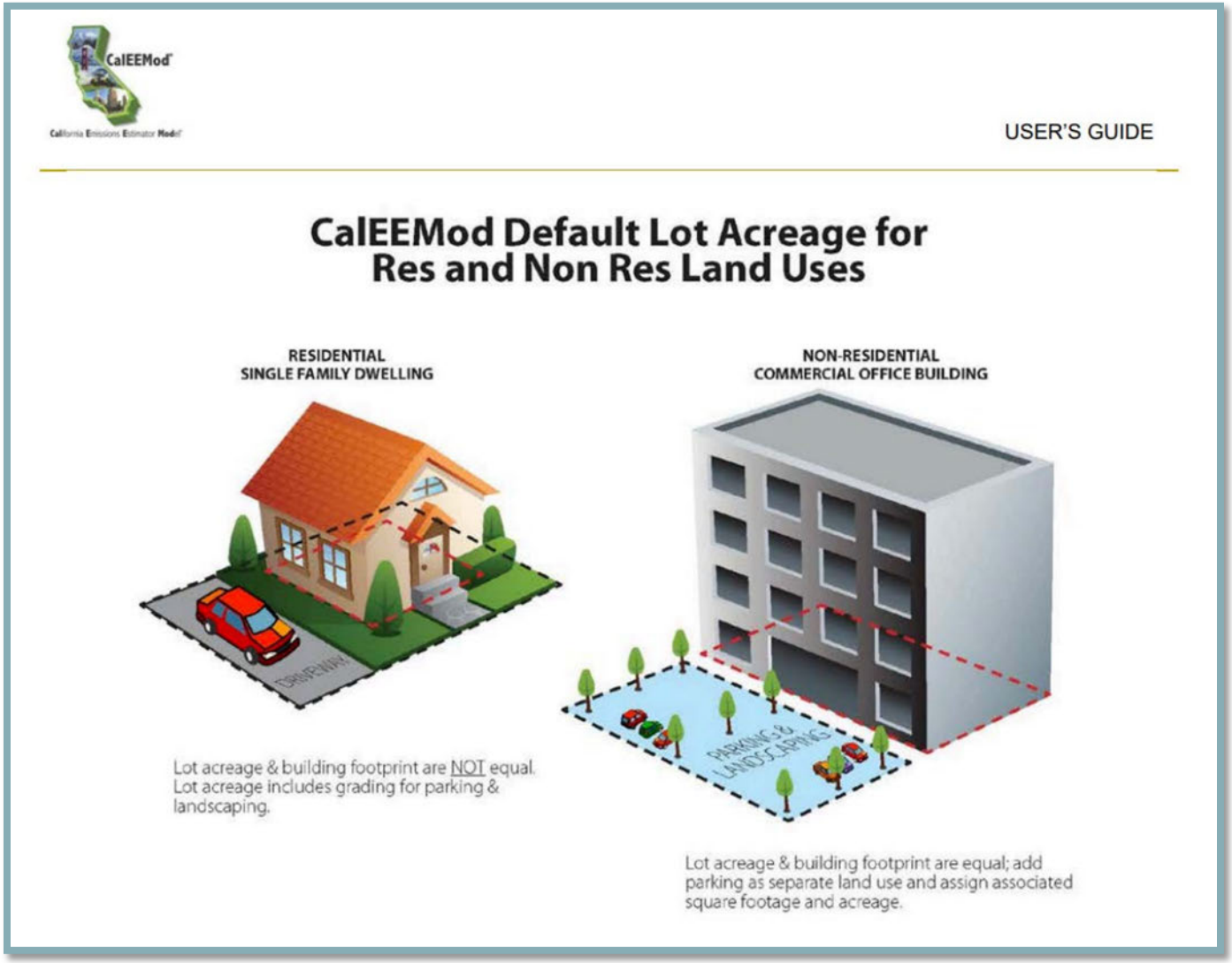
1 California Air Pollution Control Officers Association. *California Emissions Estimator Model, User's Guide, Version 2016.3.2* [pg. 20]. November 2017.

2 California Air Pollution Control Officers Association. *California Emissions Estimator Model, User's Guide, Version 2016.3.2* [pgs 30-31]. November 2017.

Figure 1
CalEEMod User Guide: Parking and Landscaping Lot Acreages



Source: California Air Pollution Control Officers Association. California Emissions Estimator Model, User's Guide, Version 2016.3.2 [pg. 21]. November 2017.

As noted in the CalEEMod User Guide, where project-specific information is known, the user should override the default values. Because project-specific information was provided by the applicant, the default construction phase lengths were adjusted to match the actual anticipated construction schedule for the project. Thus, the information used within the IS/MND represents a more accurate depiction of project construction as opposed to the CalEEMod defaults that are based on a survey conducted by an air district with jurisdiction over a portion of the state located approximately 280 miles away from the project site. Considering that the construction phase lengths used in the emissions modeling are project-specific, the commenter's comparison of the percentage increase in phase lengths from the CalEEMod default values does not provide useful information regarding the accuracy of the emissions analysis prepared for the project.

With regard to the architectural coating phase in particular, it is common practice for architectural coatings to be applied throughout the construction phase as needed. For instance, a retaining wall constructed early in the construction process may require architectural coating or sealing, prior to construction of other on-site structures. Once construction begins on the units, components of each unit would be finished at separate times, some such components may require coating prior to completion of the next task or unit. Thus, the assumption that architectural coating would occur throughout the construction phase is reasonable.

Nevertheless, in response to the comment, Page 13 of the IS/MND has been updated, as shown below, to provide greater clarity regarding the construction phasing:

> While the exact timing and length of each phase cannot be determined at this time, the following phase lengths have been assumed for the purposes of this analysis based on available project information:
>
> - Site preparation: two weeks;
> - Grading: two months;
> - Paving: one week; ~~and~~
> - Building construction: 14 months~~.~~; and
> - Architectural Coating: 14 months.

The foregoing revision clarifies the inputs used in the emissions modeling and reproduces information that was available in Appendix A of the IS/MND. The foregoing changes do not affect the analysis presented within the IS/MND.

Response to Comment 2-5

As noted in Response to Comment 2-4 above, the CalEEMod User Guide encourages users to adjust default construction values where project-specific information is known. In the case of the proposed project, the project applicant provided the area of the project site to be graded, and CalEEMod was adjusted accordingly.

With regard to grading CalEEMod assumes that grading of the site would occur both during the site preparation phase and the grading phase. The default CalEEMod values assumed that 16.5 acres would be graded during the project grading phase, while 5.50 acres would be graded during the site preparation phase. For the proposed project, grading is only anticipated to occur during the grading phase, and the CalEEMod inputs were adjusted accordingly. Thus, based on the 0.7-acre area of the site that would be graded, the default values were adjusted to reflect that grading would not occur during the site preparation phase (site preparation grading changed from 5.50 acre default to zero acres), but that grading would occur during the grading phase over a 0.7 acre portion of the site (grading phase grading area changed from 16.50 acre default to 0.7 acres). As

noted by the commenter, the area to be graded was presented in the IS/MND on page 24, and the source of the grading information was noted in CalEEMod as the project applicant.

Contrary to the commenter's assertion, the text quoted from the CalEEMod User Guide does not serve to demonstrate an insufficiency regarding the analysis presented in the IS/MND. The length and width of the grading area were not used in determining the area of grading; rather, only the total area to be graded, as provided by the project applicant, was used to determine the area to be graded during the grading phase of the project. The text emphasized by the commenter appears to expressly condone the use of the total area to be graded as a means of determining the amount of grading needed on the site. Furthermore, the grading phase is assumed to occur over two months, with multiple pieces of equipment working within the site for the duration of the grading phase. A two-month grading period with multiple pieces of equipment working within the site, represents a reasonable, if not conservative, approach to analysis for grading a total of 0.7 acres.

Considering the above, the analysis presented within the IS/MND is accurate, and the changes to the default modeling values were justified.

Response to Comment 2-6

When a particular amount of soil material import or export is input into CalEEMod, the CalEEMod software generates an anticipated number of haul trucks required to transport the specified amount of material. Unless specific information is available regarding the number of trucks required to transport the material, CalEEMod defaults should be used. In the case of the project-modeling, the change to project modeling appears to be erroneous. Based on the comment, the construction modeling for the project has been updated to return the number of haul trucks to the default value. The updated modeling results are included as Appendix B to this response to comments document. Based on the updated modeling, Table 3 on page 25 of the IS/MND is hereby revised as follows:

Table 3
Maximum Unmitigated Construction Emissions (lbs/day)

Pollutant	Proposed Project Emissions	Threshold of Significance	Exceeds Threshold?
ROG	2.96	54	**NO**
NO_X	~~18.69~~18.71	54	**NO**
PM_{10} (exhaust)	0.91	82	**NO**
PM_{10} (fugitive)	5.36	None	**N/A**
$PM_{2.5}$ (exhaust)	0.88	54	**NO**
$PM_{2.5}$ (fugitive)	2.92	None	**N/A**

Source: CalEEMod, ~~June 2019~~ September 2020 (see Appendix).

As shown in the table above, the change to haul truck information results in an increase in maximum daily construction emissions of 0.02 lbs/day. Thus, the change to haul truck information represents a minor revision, and emissions remain well below the BAAQMD's thresholds significance. The conclusions presented within the IS/MND remain valid.

Response to Comment 2-7

The State's Renewable Portfolio Standards (RPS) are a legislative requirement mandating that public utilities source a certain percentage of their retail electricity from renewable sources. Producing electricity from renewable sources reduces the GHG emissions intensity of electricity, thus reducing the amount of GHG emissions released per unit of energy consumed. The default

values for the emissions intensity of PG&E electricity in CalEEMod are based on values from the year 2008.[3] Since that time, PG&E has increased the proportion of electricity produced by renewable sources from 14 percent[4] to 39 percent by the year 2018,[5] which is the most recent year for which data is currently available. PG&E will be required to continue increasing the renewable content of their electricity in-line with the RPS eventually reaching 60 percent renewable energy content by the year 2030. Because compliance with RPS is a legislative requirement, PG&E is required to achieve the renewable electricity generation benchmarks established by the RPS. Thus, the incorporation of reduced electricity emissions factors in the emissions modeling is justified.

The RPS requirements represent the total mix of sources of electricity generation that must be used by PG&E. Although the proportion of electricity provided by renewable sources for all PG&E provided electricity is known and publicly available, the amount of electricity provided by any given source, or the electricity emissions factor for electricity provided to any given customer is not known or publicly available. Without information regarding the sources of electricity and emission factors for electricity for a specific customer, estimation of the exact emissions factor for any given project is infeasible. The lack of this specific level of detail is suggested by CalEEMod's default information, which only allows users to specify what utility provider would deliver electricity to a project site, but does not provide the user with the ability to specify an area or customer within any given utility provider's service area in order to determine a more precise emission factor. In the absence of specific, customer level data, the use of PG&E wide emissions data is considered reasonable and widely accepted, for instance as a default setting in CalEEMod. It should be noted that the use of a utility company's aggregate emission factor is an accepted industry standard approach, which is implemented uniformly in CEQA analyses within the State.

Contrary to the commenter's assertion, the use of the year 2021 actually provides a conservative basis of analysis. Although the IS/MND was released in early 2020, approval hearings for the project were on-going as of fall of 2020. Considering the approval timeline for the project, it is reasonable to assume that construction would not begin until the year 2021, with project construction then occurring over approximately 17-18 months. Thus, even while construction of the project would occur during the year 2021, the first full operational year of the project would not be anticipated to occur until 2022 or 2023. The State's RPS requirements mandate that PG&E continually increase the proportion of electricity provided by renewable sources. Consequently, electricity provided to the project site in the years 2022, 2023, and beyond would be less emissions intensive than the electricity provided to the project site in the year 2021.Taken as a whole, project-related electricity demand is not anticipated to occur until the year 2021, at which point electricity demand would be related to project construction only. Electricity demand during project construction would likely be lower than the operational electricity demand that would begin in 2022 or 2023. In 2022 and 2023, the emissions intensity of PG&E provided electricity would be lower than emissions intensity in the year 2021, and, thus, operation of the project in later years would result in lower emissions than what was estimated and analyzed in the IS/MND prepared for the project.

It should be noted that the use of the year 2021 is further supported by the commenter's own assertions in Comment 2-14. In Comment 2-14, the commenter implies that given the schedule

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3 California Air Pollution Control Officers Association. *California Emission Estimator Model Use Guide: Appendix D*. October 2017.

4 PG&E. *Planning for California's Clean Energy Future*. Available at: http://www.pgecorp.com/corp_responsibility/reports/2008/our_environment/future_planning.html. Accessed July 14, 2020.

5 PG&E. *Power Content Label*. October 10, 2019.

for the project approval process and anticipated construction period, construction is anticipated to occur primarily in the year 2021, and operations of the project are not anticipated to begin until the year 2021 or thereafter. Comparing the contents of Comment 2-7 and Comment 2-14, the commenter appears to be changing their argument against the adequacy of the analysis presented in the IS/MND to suit their needs. The information presented within the IS/MND, on the other hand, is designed to provide a realistic, worst-case analysis of potential impacts related to the project.

Based on the information provided above, the electricity intensity factor used in the project-specific emissions modeling represents the most up-to-date and accurate emissions information available for PG&E, relies on state mandated levels of renewable energy generation, and provides a conservative estimate of electricity related emissions.

Response to Comment 2-8

According to applicant provided information, the proposed residences would not include the installation of wood-fired hearths or fireplaces. Thus, the number of wood fire places and the amount of wood burned within the project site were adjusted to zero. Applicant provided information was cited within the CalEEMod outputs as the reason for the change to the emissions modeling inputs. Nevertheless, in response to the comment, page 24 of the IS/MND is hereby revised as follows:

> Accordingly, the proposed project's modeling assumes the following project and/or site-specific information:
>
> - Construction would begin in April 2020;
> - Construction would occur over an approximately 16-month period;
> - The CO_2 intensity factor was adjusted to reflect PG&E's progress towards the State renewable portfolio standards goal by the operational year (anticipated to be 2021);
> - A total of 0.7 acres of land would be graded;
> - A total of 100 CY of material would be exported during site prep and 3,000 CY during grading;
> - <u>The proposed residences would not include wood-burning hearths or fireplaces;</u>
> - Project would exceed Title 24 by 15 percent;
> - 24kWh of on-site renewable energy would be used;
> - Water conservation strategies would be applied to 30 percent of indoor and 60 percent of outdoor water use; and
> - The proposed project's required compliance with the 2016 Building Energy Efficiency Standards listed in the California Building Standards Code was assumed.

Based on the above, only minor text changes are required to the IS/MND, and the analysis presented within the IS/MND remains valid.

Response to Comment 2-9

The commenter discusses the applicability of several mitigation measures that were applied within CalEEMod. Generally, the mitigation measures apply to mobile emissions, energy consumption, and water consumption. However, for each measure it is important to note that due to the limitations of the CalEEMod software, it is sometimes necessary to apply inherent site design and project features in the "mitigation" tabs of CalEEMod, even if those measures are not necessarily mitigation under CEQA. For instance, as noted on page 24 of the IS/MND, the project, as proposed, was designed to exceed the energy efficiency requirements within the 2016 California Building Code (CBSC) by 15 percent. In addition, the project was anticipated to include on-site renewable energy generation systems (solar panels), and would include water conservation

strategies to reduce indoor water consumption by 30 percent and outdoor water consumption by 60 percent. Methods for applying the foregoing project characteristics are either impractical or not possible in CalEEMod. Therefore, all of the project characteristics mentioned above were applied in the "mitigation" tabs of CalEEMod, despite the measures being part of the design of the project.

Each type of "mitigation" is discussed in further detail below.

Mobile Measures

CalEEMod was adjusted to reflect the inherent design features of the project and the location of the project. As noted above, CalEEMod is somewhat limited in the ability to account for inherent design features through means other than mitigation. Accordingly, the project's proximity to an existing transit stop and the inclusion of a pedestrian network in the design of the project were applied as mitigation to the project, despite the fact that both measures are considered inherent design features of the project.

As noted in the IS/MND, the project site is located in close proximity to bus stops operated by SamTrans. In particular, stops for SamTrans Route 140 and Route 121 are within a quarter mile of the site. Both routes provide access to a high percentage of regional destinations including shopping areas within the City of Pacifica, Skyline College, Serramonte Center, parks, cemeteries, BART stations, and the San Francisco International Airport. In addition, the existing neighborhood includes a network of sidewalks that pedestrians could use to access nearby bus stops, and bicyclists may share the road with vehicles to access bus stops as well. Although the nearby bus lines meet the requirements for proximity and accessibility, both SamTrans Route 140 and Route 121 run on 60-minute intervals. Considering the relatively infrequent run intervals for both routes, and in light of the commenter's concerns, the CalEEMod emissions estimation for the project has been revised to exclude this measure.

Based on the updated modeling, Table 4 on page 26 of the IS/MND is hereby revised as follows:

Table 4
Unmitigated Maximum Operational Emissions

Pollutant	Proposed Project Emissions		Threshold of Significance		Exceeds Threshold?
	lbs/day	tons/yr	lbs/day	tons/yr	
ROG	~~0.71~~0.72	~~0.08~~0.09	54	10	**NO**
NO_X	~~0.67~~0.68	~~0.10~~0.11	54	10	**NO**
PM_{10} (exhaust)	0.31	0.00	82	15	**NO**
PM_{10} (fugitive)	~~0.36~~0.38	~~0.08~~0.06	None	None	**N/A**
$PM_{2.5}$ (exhaust)	0.31	0.00	54	10	**NO**
$PM_{2.5}$ (fugitive)	0.10	0.02	None	None	**N/A**
Source: CalEEMod, ~~June 2019~~September 2020 (see Appendix).					

As shown in the revisions to the table above, the updates to project modeling have resulted in minor changes to the anticipated emissions level. All emissions remain far below the BAAQMD's operational thresholds of significance. Accordingly, the conclusions presented within the IS/MND remain valid.

With regard to the proposed pedestrian network, as stated on pages 77 and 78 of the IS/MND, sidewalks currently exist along Monterey Road and the project would include connection to the existing sidewalks. In addition to the discussion on page 77 and 78, the Project Description section

of the IS/MND provides details regarding the connection of the proposed units to existing sidewalks. For instance, page 10 of the IS/MND includes the following information:

> A walkway made of decomposed granite would be constructed to connect the frontage of all eight units. Pedestrian access would also be provided to the site by the existing sidewalk along Monterey Road by two staircases leading to the walkway along the frontage of the townhouses.

The written description above is amplified by Figures 3, 5, 6, 9, and 10, each of which depict connections between all proposed units and existing sidewalk infrastructure. Thus, the project inherently complies with the "Improve Pedestrian Network" mitigation within CalEEMod, and substantial evidence is provided throughout the IS/MND.

Energy Measures

The CBSC is a portion of Title 24 of the California Code of Regulations. The CBSC includes design standards for energy efficiency, and the project applicant has committed to exceeding the energy efficiency standards of the 2016 CBSC by 15 percent. Appendix A of the CalEEMod User Guide notes that the CalEEMod mitigation measure for exceedance of Title 24 is in relation to part 6 of Title 24, and is relative to the 2013 Title 24 regulations. The 2016 Title 24 regulations expanded upon the 2013 regulations, resulting in an approximately 28 percent improvement to energy efficiency.[6] Because the 2016 Title 24 regulations are more stringent than those of the 2013 regulations, by applying a 15 percent exceedance of Title 24 energy efficiency requirements within CalEEMod, the project's improvement in energy efficiency is likely underestimated. That is, the baseline energy consumption under the 2016 Title 24 is lower than that of the 2013 Title 24, so a 15 percent improvement beyond the 2016 Title 24 regulations would result in a lower resulting energy demand as compared to a project that only exceeds the 2013 Title 24 regulations. Thus, the approach to electricity efficiency taken within the IS/MND is likely conservative, and information regarding which Title 24 regulations were being exceeded was provided both on page 24 of the IS/MND and within the CalEEMod User Guide.

Finally, since preparation of the emissions analysis presented in the IS/MND, the 2019 CBSC (part of Title 24) came into effect, which includes more stringent energy efficiency requirements as compared to the 2016 CBSC. The proposed project would be required to comply with the 2019 CBSC requirements, which would exceed the energy efficiency requirements of the 2016 CBSC, and would greatly exceed the requirements of the 2013 CBSC. Compliance with the 2019 CBSC requirements would likely reduce energy demand below the levels anticipated within the IS/MND, ensuring that the approach to analysis in the IS/MND is conservative.

Compliance with Title 24 (including the CBSC), as well as all features included as inherent features of the project in the IS/MND would be ensured during the City's building permit and approval process.

With regard to on-site renewable energy systems, as noted on page 24 of the IS/MND, the inclusion of an on-site renewable energy system is a proposed part of the project. In addition, since preparation of the emissions analysis for the proposed project, the 2019 CBSC has been adopted, which requires that all residential structures of three stories or less in height be constructed with on-site solar energy systems sufficient to meet 100 percent of each residence's demand. The assumption that the project would include only 24 kWh of on-site renewable

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[6] California Energy Commission. *2016 Building Energy Efficiency Standards Frequently Asked Questions*. June 2015.

electricity generation is therefore conservative, and likely underestimates the amount of solar electricity that would be provided within the site. While the solar energy systems are considered the likely source of on-site renewable energy, a requirement that the exact source of renewable energy be specified does not exist. Although the eventual source of on-site renewable energy does not need to be disclosed, the likely source is on-site solar energy systems, which could feasibly provide the required amount of electricity to the proposed structures.

Because CalEEMod incorporates all of the relevant mitigation measures from the California Air Pollution Control Officers Associations' (CAPCOA's) publication, *Quantifying Greenhouse Gas Mitigation Measures*, all of the information requested by the commenter is included in the CalEEMod outputs presented as Appendix A to the IS/MND (see pages 24 through 26 of the Annual emissions outputs), and further calculations or information are not necessary to substantiate the use of the measure.

Water Measures

Page 24 of the IS/MND provides justification for implementation of this measure as water use reductions would be an inherent feature of the project. Similar to the discussion of renewable energy generation above, CalEEMod incorporates CAPCOA's mitigation measures, and the reduction in water use due to this measure is presented within Appendix A of the IS/MND (see pages 28 through 30 of the Annual emissions outputs).

Conclusion Regarding On-Model Mitigation Measures

As noted above, the CalEEMod inputs are substantiated within the IS/MND, and adequate information is provided within the IS/MND and Appendix A of the IS/MND to demonstrate that the emissions estimates presented in the IS/MND may be relied upon to determine the significance of air quality impacts resulting from the project. The minor revisions made in response to the commenter's concern do not change the conclusions of the analysis presented within the IS/MND.

Response to Comment 2-10

With regard to SWAPE's first claim, health risks resulting from exposure to toxic air contaminants (TACs) are dependent both on dosage and the exposure period. Both factors were considered when assessing the potential impacts resulting from emission of diesel particulate matter (DPM) during project construction. DPM is the solid material in diesel exhaust, more than 90 percent of such material is less than one micrometer in diameter, and DPM is typically composed of carbon particles (soot) and numerous other organic compounds including 40 known cancer-causing substances. Pages 28 through 29 of the IS/MND present a discussion of the limited duration of potential exposure, as well as the existing regulations that would reduce the emission of DPM. For instance, project construction would be limited to a one to two-year period, and all off-road equipment operating at the site would be subject to the In-Use Off-Road Diesel Vehicle Regulation, which requires increasingly stringent emissions standards be met by off-road equipment. Thus, nearby receptors would not be exposed to emissions from on-site construction equipment for a substantial amount of time, and emissions from on-site construction equipment must be reduced in compliance with the existing statewide regulations related to off-road diesel vehicles. A common surrogate for DPM is $PM_{2.5}$, which was estimated as part of the CalEEMod emissions estimates prepared for the IS/MND and revised herein. As demonstrated in this response to comments, exhaust emissions of $PM_{2.5}$ would be released at a maximum rate of 0.88 lbs/day, which is far below the BAAQMD's thresholds for significance for exhaust-related $PM_{2.5}$. While BAAQMD's threshold of significance is not necessarily meant to serve as a threshold for DPM emissions, the fact that total exhaust related $PM_{2.5}$ emissions would be far below the BAAQMD's thresholds of significance provides an indication of the comparative scope of

emissions that would occur due to the proposed project. Based on the above, the amount of DPM emitted during on-site construction activity would be low, and given the dispersive nature of DPM, the ultimate dosage at any nearby receptor location would be limited. Furthermore, the period of time during which DPM emissions would occur is also relatively limited. Because health risks are a result of dosage and exposure duration, the IS/MND concluded that the proposed project would not result in significant health risks related to project construction.

SWAPE's claim that the "OEHHA document recommends that all short-term projects lasting at least two months be evaluated for cancer risks to nearby sensitive receptors" is misleading. The quoted text from SWAPE's comment cites page 8-18, within Section 8.2.10, of the OEHHA guidance document as the source of this information; however, page 8-18 does not contain such a recommendation. Rather, page 8-18 includes recommendations related to how to conduct a health risk assessment (HRA) for short-term projects, not whether or not short-term projects should be evaluated if such projects exceed two-months. The likely source of SWAPE's claim is presented in the following quoted text from page 8-18 the OEHHA Guide:

> Due to the uncertainty in assessing cancer risk from very short-term exposures, we do not recommend assessing cancer risk for projects lasting less than two months at the MEIR. We recommend that exposure from projects longer than 2 months but less than 6 months be assumed to last 6 months (e.g., a 2-month project would be evaluated as if it lasted 6 months). Exposure from projects lasting more than 6 months should be evaluated for the duration of the project. In all cases, for assessing risk to residential receptors, the exposure should be assumed to start in the third trimester to allow for the use of the ASFs (OEHHA, 2009). Thus, for example, if the District is evaluating a proposed 5-year mitigation project at a hazardous waste site, the cancer risks for the residents would be calculated based on exposures starting in the third trimester through the first five years of life.

Based on the quoted text above, SWAPE appears to misconstrue the OEHHA's recommendation that projects shorter than two months not be analyzed, as direction that all projects longer than two months be analyzed. However, in the context of the entire paragraph presented above, the OEHHA guide seems instead to be providing recommendations on the exposure periods to be used in preparing HRAs without providing direct guidance as to whether or not a HRA should be prepared. In fact, in the Introduction section of the OEHHA Guide, OEHHA states "[t]he Hot Spots Act requires that each local Air Pollution Control District or Air Quality Management District (hereinafter referred to as District) determine which facilities will prepare a HRA."[7] The quoted text from the Introduction section of the OEHHA Guide demonstrates that the OEHHA Guide is not intended to define what projects must be assessed in a HRA, but instead that the guide is intended to establish consistent methodologies for the assessment of health risks where such assessments are deemed necessary by other entities. The conclusion that the OEHHA Guide is intended to provide methodological guidance rather than prescriptive guidance on when a HRA should be prepared is supported by the first paragraph of the section cited by SWAPE, section 8.2.10 of the OEHHA Guidelines:

> The local air pollution control districts sometimes use the risk assessment guidelines for the Hot Spots program in permitting decisions for short-term projects such as construction or waste site remediation. Frequently, the issue of how to address cancer risks from short-term projects arises.

[7] Office of Environmental Health Hazard Assessment. *Air Toxics Hot Spots Program Risk Assessment Guidelines* [pg 1-3]. February 2015.

Based on the text above, Section 8.2.10, which SWAPE interprets as recommending HRAs for short-term projects, seems to instead be intended to provide information for such projects, without making conclusions as to where or when such HRAs should be prepared.

Moreover, SWAPE's conclusion "that an EIR must be prepared to evaluate health risk impacts" does not seem justified. Preparation of a HRA, when required, does not trigger the need for an EIR, and HRAs are routinely included in Initial Studies. Thus, in the case of the proposed project, a HRA is not needed, is not required by OEHHA's guidelines, and would not necessarily trigger the need for preparation of an EIR.

SWAPE's second claim relates more directly to operational emissions. On page 28 the IS/MND correctly states: "The proposed townhouses would not involve any land uses or operations that would be considered major sources of TACs, including DPM. As such, the project would not generate any substantial pollutant concentrations during operations." The determination that project operations would not result in substantial TAC emissions was made based on the common sources of TACs included in the California Air Resource Board's *Air Quality and Land Use Handbook: A Community Health Perspective* (Handbook), as well as Raney's professional judgement regarding typical activities associated with residential developments. The CARB's Handbook includes land uses such chrome plating facilities, gas dispensing facilities, certain dry cleaners, freeways and high traffic roads, distribution centers, and rail yards as typical sources of TACs. Residential uses, such as those included in the proposed project, involve none of the TAC producing activities that occur in association with the CARB identified TAC emitting land uses. The commenter is correct that operation of the project would involve approximately 76 vehicle trips per day; however, the CARB does not consider roadways to be major sources of TACs unless the roadway experiences at least 50,000 vehicles per day. Monterey Road does not experience roadway traffic anywhere close to this volume of vehicles, and the addition of project-related traffic would not result in a substantial amount of increased TAC emissions from operation of Monterey Road. Moreover, the limited amount of TAC emissions that would be generated by the anticipated 76 daily vehicle trips would be distributed throughout the atmosphere over the entire length of each vehicle trip. As a result, a single receptor would not be exposed to even the relatively minor concentration of TACs generated by all of the anticipated project-related daily vehicle trips. Finally, the majority of passenger vehicles are gasoline powered, with only small percentages of passenger vehicles being diesel or electrically powered. Gasoline and electric vehicles do not release DPM, which is the pollutant that SWAPE ultimately claims would be released during project operations. Thus, it is unlikely that DPM would be emitted by project-related vehicles, and if a future resident on-site happens to own a diesel vehicle, emissions from that vehicle would be minimal, because passenger vehicle DPM emissions are much less than emissions from heavy-duty equipment or heavy-duty diesel trucks, and would be dispersed throughout the path of travel of the vehicle.

The foregoing consideration of potential operational sources of TACs associated with the project demonstrates that the proposed project would not result in substantial TAC emissions over the lifetime of the project. Considering the contents of the OEHHA guide discussed above, OEHHA does not require that a HRA be prepared for each and every project; rather, HRAs need only be prepared where a significant source of TACs has been identified. In the case of the proposed project, an operational source of TACs does not exist and has not been identified by SWAPE. Therefore, while the project would operate over an extended period of time, project operations would not result in TAC emissions or substantial health risks to any nearby receptors and an operational HRA is not required.

With regard to SWAPE's third claim, because the project was determined not to result in the substantial release of TACs, the project would not have the potential to result in health risks to nearby receptors, and a detailed HRA does not need to be prepared in order to determine that the project would not exceed the BAAQMD's specific numeric thresholds of significance.

For further information regarding SWAPE's screening-level HRA, and why the analysis cannot be relied upon to support determination of health risks related to the project, please refer to Response to Comment 2-11.

Response to Comment 2-11

In order to prepare a screening-level HRA SWAPE prepared a CalEEMod run that differed significantly from the CalEEMod run prepared for the proposed project. As discussed in Response to Comments 2-2 through 2-9 the emissions estimation prepared for the proposed project required only minor revisions, which resulted in small changes to the estimated emissions levels. The changes implemented by SWAPE, such as the use of default construction phase lengths and grading areas, as well as changes to the energy intensity factor and project design characteristics are not justified and have likely been implemented to artificially increase project-related emissions. For instance, the land uses applied by SWAPE in CalEEMod include an "enclosed parking structure", two separate "city park" land uses, and single-family housing. The total acreage of these land uses adds up to 1.40 acres, despite the fact that the project site is only 1.2 acres, and only 0.7 acres would be disturbed with implementation of the project. Increasing the acreage of the site would likely increase emissions from construction and operation of the project. Furthermore, the use of the "enclosed parking structure" and "city park" is incorrect. As discussed in Response to Comment 2-3, area for parking and landscaping is inherently included in the single-family land use assumptions. In addition, the CalEEMod User Guide defines an enclosed parking land use as the following:

> This is an enclosed parking structure that may be above or below ground. It is not covered in asphalt. This land use will require lighting and ventilation, and will be more than one floor with no elevator.[8]

The proposed garages are attached to each residential unit and are located on one floor only. The garages are not a separate use, and the "enclosed parking structure" is intended for use in standalone, multi-story parking structures, not single-family residential garages. The "city park" land use is defined in the CalEEMod User Guide as the following, "City parks are owned and operated by a city."[9] The on-site open space areas would not be owned by the city, and would be for the benefit of the project residents alone. Thus, use of the city park land use is incorrect.

The emissions estimates generated by CalEEMod are dependent upon the land uses input into the model. Thus, by using incorrect land uses SWAPE's emissions estimates are invalid and do not provide a realistic estimate of project-related emissions or health risks. Furthermore, by ignoring project-specific information SWAPE further invalidates their own analysis. Because the screening-level HRA presented by SWAPE is based on the emissions that SWAPE incorrectly estimated, the results in the screening-level HRA prepared by SWAPE may be summarily rejected as invalid and not representative of the project.

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[8] California Air Pollution Control Officers Association. *California Emissions Estimator Model, User's Guide, Version 2016.3.2* [pg. 24]. November 2017.

[9] California Air Pollution Control Officers Association. *California Emissions Estimator Model, User's Guide, Version 2016.3.2* [pg. 23]. November 2017.

Notwithstanding the above, the technical approach and conclusions of SWAPE's screening-level HRA are further analyzed to determine the validity of SWAPE's remaining assumptions and methodology.

DPM is the solid material in diesel exhaust, because more than 90 percent of such material is less than one micrometer in diameter, DPM is a subset of the $PM_{2.5}$ category of pollutants.[10] Despite DPM being a subset of $PM_{2.5}$, SWAPE has used PM_{10} as a proxy to estimate emissions of DPM. PM_{10} includes larger size classes of particles, those particles equal to or less than 10 micrometer in diameter, as well as the smaller size classes included in $PM_{2.5}$. By assuming all PM_{10} emissions represent DPM, SWAPE has inflated the amount of DPM emissions occurring due to the project. For instance, according to SWAPE's own construction modeling, maximum annual exhaust emissions of PM_{10} would be 0.0764 tons per year (tons/yr) while maximum annual exhaust emissions of $PM_{2.5}$ would be 0.0729 tons/yr. Given the sensitive nature of DPM emissions and dispersion analyses, even a slight discrepancy in the total emissions can lead to large changes in health risks. Without further justification for the use of PM_{10} rather than the more accurate $PM_{2.5}$, the veracity of SWAPE's conclusions regarding project-related health risks is further diminished.

Despite review of SWAPE's CalEEMod outputs, the method by which SWAPE arrives at an estimate of 153 pounds of DPM emitted over the construction period is unclear. Without the ability to replicate SWAPE's assumptions regarding DPM emissions, the accuracy of the emissions calculations used by SWAPE in the HRA, and the resulting estimation of health risks, cannot be verified.

SWAPE goes on to estimate that 28.56 pounds of DPM would be emitted per year through project operations. Again, the source of this estimate is unclear. For instance, CalEEMod provides an estimate of annual operational emissions of PM_{10} and $PM_{2.5}$ in tons/yr. In order to determine an annual emission rate, it would seem reasonable that SWAPE would have used the CalEEMod provided estimates of annual operational exhaust emissions as a proxy for DPM emissions (as DPM is only emitted as exhaust from diesel engines). However, if the total annual estimate of exhaust sourced PM_{10} is considered (0.0122 tons/year from all sources including energy and area sources), average daily emissions would only equate to 24.4 pounds of PM_{10} per year. The discrepancy between the estimate of PM_{10} emissions in SWAPE's own CalEEMod output files and SWAPE's screening-level HRA is not explained. This overestimation of DPM emissions, both through the use of PM_{10} and through seemingly inflating the annual estimated emissions, would result in overestimated and inaccurate health risks.

As discussed in Response to Comment 2-10, and on page 28 of the IS/MND, the project would not involve operational sources of DPM. Because SWAPE has not identified any operational sources of DPM, interpretation of the CalEEMod estimated emissions of PM_{10} as DPM lacks justification. PM_{10} is any particulate matter that is less than 10 micrometers in diameter; thus, PM_{10} includes a wide variety of potential particles including compounds that are directly emitted or those that form through chemical reactions in the atmosphere. With no clear source of DPM related to the project, assuming that the estimate of PM_{10} emissions generated by CalEEMod represents DPM lacks support. Despite the lack of specifically identified operational sources of DPM, SWAPE states that "A release height of three meters was selected to represent the height of exhaust stacks on operational equipment and other heavy-duty vehicles…was used to simulate instantaneous plum dispersion upon release." Residential uses do not involve the use of

[10] California Air Resources Board. *Overview: Diesel Exhaust & Health*. Available at: https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health. Accessed September 2020.

operational equipment with exhaust stacks that release DPM or heavy-duty vehicles. SWAPE does not provide support for why this highly unusual use of equipment with exhaust stacks or heavy-duty vehicles would occur during project operations, thus rendering the commenter's assumption that operational emissions of DPM would occur unsupported. Such inputs are better suited to the analysis of a construction project, and use of unsupported modeling parameters would return erroneous estimates of emissions dispersion and resulting concentrations.

Based on the information provided above, the screening-level HRA prepared by SWAPE is fatally flawed by erroneous methodologies used to estimate emissions. The basic flaw in SWAPE's analysis is then compounded by an overestimation of DPM emissions, unsupported conclusions related to average DPM emissions, unsupported assertions related to operational emissions of DPM, and erroneous modeling parameters. Consequently, the results of SWAPE's screening-level HRA cannot be relied upon to accurately represent the potential health risks resulting from implementation of the project, and the conclusions presented in the IS/MND related to health risks remain valid.

Response to Comment 2-12

The comment summarizes SWAPE's assertions regarding the adequacy of the GHG emissions analysis presented within the IS/MND. As discussed previously and in further depth below, the emissions modeling presented within the IS/MND requires only minor technical revisions, which do not appreciably affect the total emissions estimates or conclusions reached in the IS/MND. The thresholds used within the IS/MND are valid, and SWAPE's assertion that the IS/MND's purported reliance on the CAP is misleading. Further information related to the foregoing issues is provided below.

Response to Comment 2-13

The commenter's assertions regarding the inputs used in the CalEEMod emissions estimates prepared for the project have been discussed in-depth within Response to Comments 2-2 through 2-9. As discussed in Response to Comments 2-6 and 2-9, an updated CalEEMod emissions estimation has been prepared to remove the transit-related mitigation and correct an error related to the number of haul trucks required during project construction. As such, page 51 and 52 of the IS/MND are hereby revised as follows:

> Construction of the proposed project was anticipated to occur over approximately 16 months with total emissions of ~~381.27~~381.34 $MTCO_2e$/yr. Operational emissions were determined to equal ~~94.58~~89.86 $MTCO_2e$/yr. Consequently, even if project operational and construction emissions were considered together, the total GHG emissions of ~~475.85~~471.20 $MTCO_2e$/yr would be well below BAAQMD's threshold of 1,100 $MTCO_2e$/yr. Therefore, neither construction nor operation of the proposed project would be anticipated to result in significant emissions of GHGs.

As shown in the above revisions, the changes to the emissions modeling made in response to the comments results in only minor changes to the estimate of emissions presented in the IS/MND. In addition, in the course of updating the discussion above, staff noted that an inconsistency existed between the estimated operational GHG emissions presented in the quoted text and the estimated GHG emissions in Appendix A of the IS/MND. The operational GHG emissions presented within the text of the IS/MND appear to be slightly higher than the actual estimated operational GHG emissions presented within Appendix A of the IS/MND. The revisions presented above ensure that the construction and operational GHG emissions estimates match the updated CalEEMod estimates.

The resulting changes in estimated emissions related to construction and operation of the project are minor. Emissions from construction and operations of the project remain below the 1,100 $MTCO_2e$/yr threshold used in the IS/MND, and are further discussed in Response to Comment 2-14. Considering the minor revisions to project modeling and limited change to emissions estimates, the results presented in the IS/MND remain valid and supported by substantial evidence.

Response to Comment 2-14

As stated on page 51 of the IS/MND, the analysis presented in the IS/MND relies on BAAQMD's adopted thresholds of significance at the time that the environmental analysis of the project was prepared. In the absence of any other adopted thresholds or any formally adopted guidance from BAAQMD for the analysis of GHG emission beyond the year 2020, BAAQMD's adopted thresholds of significance for project-level operational GHG emissions of 1,100 $MTCO_2e$/yr or 4.6 $MTCO_2e$/yr per service population were deemed appropriate for use in the IS/MND. In fact, on February 25, 2020, BAAQMD re-posted their CEQA thresholds of significance, and continued to include the foregoing GHG emissions thresholds.[11] Although BAAQMD has reissued their adopted GHG thresholds, BAAQMD has not yet published guidance stating that such thresholds are outdated or inapplicable. In the absence of published guidance regarding the use of alternative thresholds of significance, BAAQMD's thresholds remain applicable.

Despite the recent promulgation of BAAQMD's GHG thresholds of significance, in response to the comment, project-related GHG emissions may be considered in light of the commenter's suggested thresholds. Prior to comparison of project emissions to the commenter's suggested thresholds, it should be noted that the commenter does not provide any methodology used to calculate their suggested threshold of 660 $MTCO_2e$/yr, nor does the commenter site any communication or guidance from BAAQMD suggesting that BAAQMD has endorsed these thresholds. Considering the lack of methodology or BAAQMD support for the suggested threshold, consideration of the commenter's suggested threshold is provided for informational purposes only.

As presented in Response to Comment 2-13, operational emissions from the project would equal 89.86 $MTCO_2e$/yr. Emissions of this magnitude would be far below the commenter's suggested threshold of 660 $MTCO_2e$/yr. Despite construction occurring over a period of time in excess of one year, even if the total construction emissions are added to the operational emissions to provide an extremely conservative approach to analysis, total emissions would equal only 471.20 $MTCO_2e$/yr, which would be below the suggested threshold. Finally, the foregoing emissions have been estimated for project operations in the year 2022, whereas the suggested threshold is for the year 2030. By the year 2030 existing RPS mandates would result in reduced emissions from the generation of electricity, and statewide vehicle fleet turnover will lead to reduced mobile-emissions from on-road vehicles and off-road equipment. Thus, if project emissions were to be modeled for the year 2030, emissions would be even less than the levels analyzed within the IS/MND and this Response to Comments document.

Based on the above, the commenter's suggested thresholds have not been released or endorsed by BAAQMD, whereas the thresholds used in the project analysis were re-released as recently as February of this year (shortly after publication of the IS/MND). Thus, the approach to analysis taken within the IS/MND is reasonable and based on existing guidance from BAAQMD. For informational purposes further analysis is provided in this Response to Comment to consider the

[11] Bay Area Air Quality Management District. *Tools and Methodologies*. Accessed September 2020. Available at: https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools.

commenter's suggested threshold. As discussed above, project-related emissions would be far below the suggested thresholds. Consequently, the analysis and conclusions presented within the IS/MND remain valid and preparation of an EIR is not required.

Response to Comment 2-15

As noted on page 52 of the IS/MND, "the City of Pacifica has adopted a Climate Action Plan (CAP) that is intended to guide reduction of GHG emissions associated with existing operations and future development in the City." In this capacity, a discussion of the City's CAP was made available within the IS/MND to provide information to the reader regarding whether development of the project would fall within the GHG emissions estimations provided in the CAP and whether the project would comply with the GHG emissions reduction measures included in the CAP. The IS/MND does not claim that the City of Pacifica's CAP is a qualified CAP or that the CAP represents a GHG Reduction Plan that would satisfy CEQA requirements related to streamlining the analysis of project-related GHG impacts. Indeed, it is because the CAP is not a qualified CAP for CEQA purposes that the IS/MND does not rely on the City's CAP for CEQA conclusions. Despite the informational nature of the City's CAP, because the City's CAP has been adopted by the City and relates to GHG emissions within the City, the CAP remains an important consideration when analyzing the consistency of proposed projects with applicable plans adopted for the purpose of reducing the emissions of GHGs, as is required by CEQA.

Although the text from the IS/MND quoted by the commenter is accurate, the quotation leaves out crucial context and the formatting has been manipulated to support the commenter's assertion. To provide a more accurate and comprehensive picture of the GHG analysis presented within the IS/MND, it is necessary to consider additional text from page 51 and 52 of the IS/MND. As modified within this Response to Comments document the relevant sections of analysis read as follows:

> The proposed project is located within the jurisdictional boundaries of BAAQMD. BAAQMD's approach to developing a threshold of significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions needed to move towards climate stabilization. If a project would generate GHG emissions above the threshold level, the project would be considered to generate significant GHG emissions and conflict with applicable GHG regulations. The BAAQMD threshold of significance for project-level operational GHG emissions is 1,100 $MTCO_2e$/yr.
>
> GHG emissions resulting from construction and operation of the proposed project were modeled with CalEEMod using the same assumptions as discussed in Section III, Air Quality, of this IS/MND. The proposed project's required compliance with the current California Building Energy Efficiency Standards Code was assumed in the modeling. In addition, the CO_2 intensity factor within the model was adjusted to reflect the PG&E's anticipated CO_2 emissions factor for 2021. All modeling outputs are included in the appendix to this IS//MND.
>
> Construction of the proposed project was anticipated to occur over approximately 16 months with total emissions of ~~381.27~~381.34 $MTCO_2e$/yr. Operational emissions were determined to equal ~~94.58~~89.86 $MTCO_2e$/yr. Consequently, even if project operational and construction emissions were considered together, the total GHG emissions of ~~475.85~~471.20 $MTCO_2e$/yr would be well below BAAQMD's threshold of 1,100 $MTCO_2e$/yr. Therefore, neither construction nor operation of the proposed project would be anticipated to result in significant emissions of GHGs.

> It should be noted that the City of Pacifica has adopted a Climate Action Plan (CAP) that is intended to guide reduction of GHG emissions associated with existing operations and future development in the City.[14] The GHG inventory contained in the City's CAP was derived based on the land use designations and associated densities defined in the City's General Plan. Additionally, the CAP establishes a number of reduction measures, including the use of renewable energy, safe routes to school, and water conservation incentives. As discussed above, 24 kWh of energy used by the project would be generated by on-site renewable sources, the site is in walking distance of Sunset Ridge Elementary School, and water conservation strategies would be applied to meet a 30 percent reduction of indoor water and 60 percent outdoor. Because the proposed project would be consistent with the CAP's reduction measures and with the project site's existing General Plan land use designation, the project would be consistent with the GHG inventory contained in the CAP.
>
> Based on the above, the proposed project would not be considered to generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs; and impacts would be considered ***less than significant***.

Presenting the text quoted by the commenter in context, the reader can see that the analysis presented in the GHG section of the IS/MND first and foremost considers project-related emissions. The discussion of the City's CAP is then provided to demonstrate the project's compliance with the City's CAP, but is not the basis of the less-than-significant conclusion. In quoting text from the IS/MND the commenter has omitted a crucial paragraph break between the paragraph discussing the City's CAP and the conclusion paragraph of the section. Omission of the paragraph break gives the reader the false impression that the entire conclusion of the GHG section is based solely on the analysis of the City's CAP. In reality, the conclusion of the GHG section is based on the full two pages of analysis, including quantification of project-related emissions and comparison of such emissions to BAAQMD's adopted thresholds of significance. Thus, the commenter's assertion that the less-than-significant conclusion presented in the IS/MND is based solely on the City's CAP is incorrect and misleading.

Considering that the conclusions presented within the IS/MND are based on the quantification of project-level emissions, and that the City's CAP is the only adopted plan within the City that relates to GHG emissions, the approach taken within the IS/MND remains valid. Thus, preparation of an EIR is not required.

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September 14, 2020

Reina Heinz
M.S., Human Dimensions of Natural Resources
WildAid Marine Conservation Fellow

Subject: Review of *Revised Biological Resources Assessment Vista Mar Development, Pacifica, California*

Dear Ms. Heinz:

At your request, I conducted a review of the Revised Biological Resources Assessment prepared by WRA Environmental Consultants for the Vista Mar Development Project, Pacifica, California, (dated August 2019)[1]. I have conducted Biological Resource Assessments in San Mateo County since 1995 and have 25 years of experience preparing these types of reports. I have attached my resume which shows my experience with the special status species and habitats discussed in the report.

3-1 The intent of a Biological Resources Assessment is to provide decision makers (in this case, The City of Pacifica) the information needed to determine if a proposed project would have a significant impact on biological resources under the California Environmental Quality Act.

The Biological Resources Assessment Report is thoroughly done in most areas. The report provides a comprehensive review of the special status species in the region that have some potential for occurrence, and provides a preliminary understanding of the wetland habitats on the property. However there are some major deficiencies in the report, in my opinion, as stated below.

1) The report states on page 22, that the project could have a significant impact (Impact BIO-3) on wetlands on the site, and recommends a Wetland Delineation be conducted as a mitigation measure (Mitigation Measure 6). The report concludes that by conducting a Wetland Delineation, and complying with any permit requirements from the USACE, RWQCB, and CDFW, that all wetland impacts will be reduced to 'less than significant'.

3-2 The purpose of conducting a Wetland Delineation is to determine if there are any federal or state jurisdictional wetlands or waters of the US on a site. It is a biological study, similar to a Biological Resources Assessment. By itself, it does not mitigate for any impacts that the project may have to the wetlands on the site. At this time it is not known, what impact the project may have on state and federal wetlands until a Wetland Delineation is conducted, because the actual extent of jurisdictional wetlands is unknown.

In addition, a Wetland Delineation can be conducted at any time of year, so there is no viable reason to postponing conducting a Wetland Delineation. It should be conducted as part of the CEQA review process prior to project approval.

[1] https://www.cityofpacifica.org/civicax/filebank/blobdload.aspx?t=58916.92&BlobID=16419

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2) The report states that field surveys were conducted at the site on July 2 and July 12, and no San Francisco dusky-footed woodrats or woodrat middens were observed. The San Francisco dusky-footed woodrat is a California species of special concern. Mitigation Measure IV-1a on page 34 states that preconstruction surveys for this species will be conducted and the results of the survey will be submitted to CDFW 'one week prior to ground disturbance".

3-3 It is not clear to me that the site was thoroughly inspected for this species. If there is potential for woodrats on the site, the site should be more thoroughly surveyed and all woodrat midden locations shown on a map. Woodrat middens are typically large stick structures (on the ground, or in the trees), that can be easily observed and mapped, though it requires a biologist to thoroughly inspect dense brush areas. If no woodrats/ woodrat middens are found in the proposed project development footprint after a thorough survey, then a single preconstruction survey is warranted to ensure this species has not colonized the area. If this species is present, a mitigation plan that may include relocation of the middens and/or woodrats should be developed and approved by CDFW, well prior to any groundbreaking on the site.

3) In the analysis of the potential for the federally endangered Mission blue butterfly on page 15, the report states that "*a few lupine individuals (less than 5), either many-colored lupine (L. variicolor) or silver lupine (Lupinus albifrons), were observed within a small clearing of the Monterey pine forest within 50 feet uphill of Monterey Road. Although these species are host plants for Mission blue butterfly, there are less than five plants, all surrounded by Monterey pines and located just off the road in the western portion of the Study Area. No host plants were present in the grasslands that my provide connectivity to the observed plants. In addition, no nectar plants were observed within the Study Area.*"

3-4 While it is unlikely that mission blue butterflies would utilize only a few host plant lupines on site, a survey of these plants for mission blue butterflies (eggs, larvae, or adults) during the peak of the mission blues' flight season (April/ May) would be warranted. The site is bordered by several acres of undeveloped open space to the north (that is not discussed in the report) and if mission blue habitat is in adjacent areas, then the probability of their occurrence on the project site is much higher. Furthermore, the report states that there are 'no nectar plants' for mission blue butterflies on the site, however the mission blue butterfly has been documented using a wide variety of native and nonnative plants species as nectar sources, so it is highly likely that there are some potential nectar sources on the property for this species. The adjacent undeveloped open space areas should have been included within a larger study area to evaluate habitat for this species.

Mitigation Measures 1 and 2 describe a "Pre-Construction Mission Blue Butterfly Habitat Assessment" and a "Protocol-level Pre-construction Surveys for Mission Blue Butterfly Host Plant and Larvae". Once again, these studies are presented as mitigation measures to be completed just prior to 'project activities', rather than as part of the environmental review process. The site should be more thoroughly inspected for mission blue habitat and potential for presence in a follow up survey report, and not part of preconstruction surveys just prior to grading of the site.

4) The California red-legged frog and the San Francisco garter snake have some potential for presence on the site due to the presence of wetland habitats. The report provides information on these species and discusses that these species are unlikely to be present, based on the lack

3-5 of suitable wetlands on site. This may be true, but the site is contiguous with wetland habitats on the undeveloped parcel to the north. It is unknown whether there is potential habitat on the adjacent open space which could provide more suitable habitat for these species. These areas should have been included within a larger study area to evaluate habitat for these species.

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3-6 5) In the analysis of the potential for the federally endangered Callippe silverspot butterfly on pages 15 and 16, the report states that the host plant for the Callippe silverspot butterfly was not observed on site during the field surveys in July. The host plant for the Callippe silverspot (*Viola pedunculata*) is typically not visible in July, as it dies back in the late summer/fall. This species would need to be surveyed for in late April or May to determine if it is present on site. Similarly, the site should be surveyed at this time of year (April/May) when most of the rare plants that have potential for presence would be visible.

3-7 6) The report concluded that there was a moderate potential for impacts to hoary bats, but no surveys for hoary bats, or roosting bats in general, was recommended. The site should be surveyed for roosting bats including hoary bats, as other bat species could utilize the trees on site, and impacting a maternity (i.e. breeding) colony of bats would be considered a significant impact under CEQA[2].

3-8 In summary, the biological report consistently recommends surveys for endangered species and wetland delineations as "mitigations" instead of doing them as part of the biological review under CEQA. By utilizing this strategy, the project could be approved before all of the biological information is available for the Planning Commission, the City Council and the public to make an informed decision on whether or not to permit the project. Though preconstruction surveys are important for ensuring that impacts to individual special status species are avoided or minimized, they should not be relied on as means to avoid doing the necessary surveys to determine whether biological resources (i.e. special status species, jurisdictional wetlands) are actually present.

Sincerely,

Patrick Kobernus
Principal Biologist

[2] d) Initial Study Checklist: Biological Resources (Question IV d); Would the project: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?
https://resources.ca.gov/CNRALegacyFiles/ceqa/docs/2016_CEQA_Statutes_and_Guidelines_Appendix_G.pdf

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Patrick Kobernus,
Principal Wildlife Biologist
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Patrick Kobernus is a Principal Biologist and Managing Member of Coast Ridge Ecology, and has over 25 years experience as a professional wildlife biologist. He currently manages a staff of six biologists and environmental specialists. He is experienced in conducting wildlife surveys for mammals, birds, amphibians, reptiles, fish, insects and in supervising biological monitoring crews, endangered species surveys, rare plant mapping, and overseeing habitat management and restoration projects.

Mr. Kobernus has conducted USFWS protocol surveys for California tiger salamander (100+ hours) and California red-legged frog (200+ hours), as well as electrofishing and trapping surveys for steelhead (300+ hours) in San Mateo Creek, Alameda Creek, San Leandro Creek, San Lorenzo Creek, West Union Creek, Bear Gulch Creek, Miller Creek and San Francisquito Creek. He also has experience surveying, trapping, relocating and reintroducing western pond turtles (100+ hours) in San Mateo County. Mr. Kobernus has conducted surveys and supervised the dismantling and relocation of San Francisco dusky-footed woodrat middens (300+ hours) for the Crystal Springs / San Andreas Transmission System Upgrade Project (CSSA).

Since 2010, Mr. Kobernus has served as a lead biologist for the CSSA project and the SFPUC Bioregional Habitat Restoration Program (BHR). Mr. Kobernus has conducted extensive surveys and consulted on mitigation efforts for nesting birds, roosting bats including Townsend's big-eared bat, California red-legged frog, foothill yellow-legged frog, San Francisco garter snake, western pond turtle, steelhead, San Francisco dusky-footed woodrat, mission blue butterfly and rare serpentine, coastal prairie and riparian plants. Mr. Kobernus has worked closely with the USFWS, NMFS, USACOE, RWQCB and local jurisdictions to develop suitable avoidance measures, relocation plans and mitigation efforts for special status species.

Mr. Kobernus served as the Habitat Manager for the San Bruno Mountain Habitat Conservation Plan in San Mateo County for 13 years (1995-2007), where he supervised field crews monitoring three endangered butterfly species (mission blue butterfly, Callippe silverspot butterfly and San Bruno Elfin butterfly) and mapping of the butterflies' host and nectar plants. He has conducted surveys for Smith's blue butterfly in Monterey County on two separate projects along the Monterey Peninsula. Mr. Kobernus has conducted several bat surveys and bat mitigation projects in the San Francisco Bay Area, and has identified two previously unknown maternity colonies of Townsend's big-eared bats using visual and acoustic methods.

Mr. Kobernus has conducted surveys within coastal redwood forest, oak woodlands, coastal and montane riparian, vernal pool, valley needlegrass grasslands, coastal scrub, coastal prairie, serpentine grasslands, coastal dune, freshwater ponds and marshes, and saltmarsh habitats, among others.

He has conducted nesting bird surveys and monitored nest sites for raptors including burrowing owl, peregrine falcon, northern spotted owl, white-tailed kite, Cooper's hawk and Swainson's hawk, and has conducted surveys for marbled murrelet, passerines and shorebirds within San Mateo, Santa Clara, Alameda, Sonoma, Yolo, Mendocino, Contra Costa, Marin, Santa Cruz and San Francisco Counties. Mr. Kobernus has monitored burrowing owls during the nesting and wintering seasons along the baylands in Santa Clara County, and has observed mating, feeding and other behaviors at burrowing owl populations in Mountain View, Morgan Hill and Palo Alto/Menlo Park.

Mr. Kobernus holds a California Department of Fish and Wildlife scientific collecting permit and USFWS 10(a)(1)(A) Recovery Permit for the California red-legged frog, San Francisco garter snake and the California tiger salamander.

Mr. Kobernus has extensive experience in preparing Local Coastal Program biological impact forms, Joint Aquatic Resource Permit Applications (JARPA), California Department of Fish and Wildlife 1602 Streambed Alteration Agreements, section 404 permit applications with the US Army Corps of Engineers (ACOE) and 401 Certification applications with the California Regional Water Quality Control Board. Mr. Kobernus is a trained wetland delineator in the ACOE delineation methodology (wetland training institute, March, 2001), and has received specialty training in applied hydric soils (WTI, May 2003). He has attended The Wildlife Society bat trainings, 2006, 2008, 2012; Wildlife Acoustics bat training, 2013); Bat Conservation and Management training, July 2015). Mr. Kobernus attended the California Tiger Salamander Workshop (2013) in Livermore, CA and the Aquatic Species Survey Techniques Workshop in 2008 and 2010 in Santa Rosa, CA.

PUBLICATIONS/ PRESENTATIONS

- Kobernus, P., 2012. Managing a Mountain: The San Bruno Mountain Habitat Conservation Plan, Fremontia, Vol. 40, No. 2, May 2012.

- Longcore, T.; Lam, C. S.; Kobernus, P.; Polk, E.; Wilson, J.P., 2010. Extracting useful data from imperfect monitoring schemes: endangered butterflies at San Bruno Mountain, San Mateo County, California (1982–2000) and implications for habitat management. Journal of Insect Conservation, 2010.

- Field Presentation. 2006. San Bruno Mountain and Mori Point: Comparison of Habitat Management Models. Society for Conservation Biology Annual Meeting, July 2006.

- Presenter. 2002. Mission Blue, Callippe Silverspot, and San Bruno Elfin Butterflies on San Bruno Mountain. Mission Blue Butterfly Workshop, National Park Service, April 2002.

- Presenter. 1999. Assessment of Steelhead (*Oncorhynchus mykiss*) Presence and Habitat in San Lorenzo Creek. Urban Streams Conference, April 1999.

EDUCATION

- *MS Ecology, Cal-State University East Bay, 1998*
- *BA English, Creative Writing, Sonoma State University, 1987*

PERMITS

- California Department of Fish and Game Scientific Collecting Permit
- USFWS 10(a)(1)(A) Recovery Permit for the California red-legged frog, California tiger salamander and San Francisco garter snake.

AFFILIATIONS

The Wildlife Society, Western Section
Bat Conservation and Management
North American Butterfly Association

LETTER 3: PATRICK KOBERNUS, PRINCIPAL BIOLOGIST

Response to Comment 3-1

The comment is an introductory statement. Concerns regarding the Biological Resources Assessment (BRA) prepared for the project are discussed in further detail in the following comments.

Response to Comment 3-2

Page 36 of the IS/MND presents a description of the habitat types and potentially jurisdictional features within the project. Further information is provided in the BRA regarding the area of ephemeral drainage ditch and arroyo willow thicket present within the project site. The information presented within the BRA and IS/MND provides a sufficient amount of information to determine the potential magnitude of impacts that could result from project implementation. Based on the information included in the BRA, the IS/MND included mitigation measures IV-4 through IV-6. In order to fulfill the requirements of the foregoing mitigation measures, a wetland delineation would likely need to be prepared; however, as the commenter states, the wetland delineation alone would not be the mechanism by which the impact is reduced to a less-than-significant level. Instead, the wetland delineation would be used to inform the permit conditions enforced by the USACE, CDFW, or Regional Water Quality Control Board (RWQCB). Permit conditions for the fill of wetlands typically involve replacement of impacted wetlands at a minimum ratio of 1:1. The mitigation measures included in the IS/MND ensure that the project would comply with any actions required by the state or federal agencies as part of the project permitting requirements. Thus, the impact identified within the IS/MND would not be mitigated simply by the completion of a wetland delineation, but by compliance with the permitting requirements placed upon the project following completion of the wetland delineation. As a means of clarifying the mitigation measures included within the IS/MND, page 37 of the IS/MND is hereby revised as follows.

IV-4. *Notify USACE. Prior to initiation of construction activities, the applicant shall retain a qualified biologist to conduct a formal wetland delineation. If the ephemeral ditch is determined to be jurisdictional Water of the U.S. and State, and the impact cannot be avoided, the applicant shall obtain a permit authorization to fill wetlands under Section 404 of the federal CWA (Section 404 Permit) from USACE. The Section 404 Permit application shall include an assessment of directly impacted, avoided, and preserved acreages to waters of the U.S. Mitigation measures shall be developed as part of the Section 404 Permit to ensure no net loss of wetland function and values. Mitigation for direct impacts to waters of the U.S. associated with the proposed project would occur at a minimum of 1:1 ratio for direct impacts; however, final mitigation requirements shall be developed in consultation with USACE. In addition, a Water Quality Certification or waiver pursuant to Section 401 of the CWA must be obtained for Section 404 permit actions. The results of the wetland delineation and Section 404 permit actions shall be submitted to the Planning Department prior to initiation of construction activities.*

The foregoing revisions serve to clarify the requirements of the Section 404 permitting that would be needed if a wetland delineation identifies Waters of the U.S. within the project site. The revisions do not represent a significant alteration of the mitigation measure and impacts resulting from implementation of the project would remain less than significant.

Response to Comment 3-3

As noted on page 8 of the BRA:

> The site assessment was intended to identify the presence or absence of suitable habitat for each special-status species known to occur in the vicinity to determine its potential to occur in the Study Area. The site visit did not constitute a protocol-level survey and was not intended to determine the actual presence or absence of a species; however, if a special-status species was observed during the site visit, its presence was recorded.

Because WRA did not perform a protocol-level survey, the analysis and conclusions within the BRA and IS/MND consider the potential for species not directly observed within the site to nonetheless be present within the site. The actual presence or absence of any given species would be determined pursuant to Mitigation Measures IV-1 through IV-3 of the IS/MND. Further information regarding the efficacy of pre-construction surveys and the need for additional surveys is presented in Response to Comment 4-7. As further discussed in Response to Comment 4-7, the pre-construction surveys and protection measures required by Mitigation Measures IV-1(a) and IV-1(b) would ensure that any San Francisco dusky-footed woodrats within the site would be protected, and that project impacts would be less-than-significant.

Response to Comment 3-4

Similar to the discussion presented in Responses to Comments 3-3 and 4-7, performing pre-construction surveys to determine the presence or absence of the species closer to the time of project implementation is a reasonable approach to mitigation for the following reasons. As discussed on page 33 of the IS/MND and within the BRA, conditions within the site could become more or less favorable to the species between the time of environmental review and project-implementation; thus, pre-construction surveys would serve to identify any Mission Blue Butterfly that could potentially be impacted by implementation of the project. The conclusions of the IS/MND is that Mission Blue Butterfly may be present within the site, but that implementation of Mitigation Measure IV-2 would be sufficient to reduce potential impacts to a less-than-significant level. Considering that the IS/MND concludes that the species may exist within the site, whether the species is identified during the environmental review process or during pre-construction surveys is a moot point, as Mitigation Measure IV-2 would serve to protect the species regardless of the timing of identification. As such, the approach taken in the BRA and IS/MND is reasonable and supports the finding that impacts would remain less-than-significant following implementation of mitigation measures.

Response to Comment 3-5

Please refer to Response to Comment 4-2. As noted in Response to Comment 4-2, WRA conducted additional review of the project vicinity and determined that the conclusions presented within the BRA related to San Francisco garter snake (SFGS) and California red-legged frog (CRLF) remain accurate and supported.

Response to Comment 3-6

As stated in Chapter 1.0 Introduction (page 1), of the BRA:

> This biological resource assessment provides general information on the potential presence of sensitive species and habitats. The biological assessment is not an official protocol-level survey for listed species that may require surveys for Project approval by local, state, or federal agencies. This assessment is based on information available at the time of the study and on-site conditions that were observed on July 2 and July 12, 2019.

The report was simply documenting that the host-plant was not observed at that time; this statement was not attempting to describe results of protocol-level surveys during the appropriate blooming period of this species.

The host plant (Calippe silverspot) only occurs in native grasslands, which are not present in the project area. Protocol-level surveys for special-status plant species are necessary only when suitable habitat for a species is present. However, upon review of the BRA, an error was discovered in one of the appendices where the potential for occurrence of the Callippe silverspot butterfly is summarized. Page C-31 of Appendix C of the BRA accurately states that the species is "unlikely" to occur in the Study Area (or Project Area), but the reason for this conclusion should have been stated as the absence of suitable habitat for the butterfly's host plant, not that the host plant was not present in the Study Area. Despite this error, the conclusions of the BRA and IS/MND remain valid as the species' host plant is not anticipated to occur within the project site.

Response to Comment 3-7

As noted on page 33 of the IS/MND, "While the project site contains coniferous trees that may be suitable for roosting, the hoary bat typically likes to roost in more densely forested areas. Thus, the project site would not provide significant value as a roost site, and the project would not impact the species." Because the project site conditions are not considered suitable to provide habitat for the species, further surveys for hoary bats were not considered necessary. The conclusion of the IS/MND is further supported by the fact that the few trees that are located within the site are located on a west-facing aspect, which exposes the trees to a greater degree of wind and exposure to the elements. Most of the trees observed by WRA within the site are small and do not provide suitably large/deep hollows for the establishment of maternity or hibernacula roosts. Moreover, the site is subjected to regular direct and indirect anthropogenic disturbance due to the nearby developments, as well as vehicular and pedestrian traffic nearby the site, all of which act as a deterrent to roosting for several special-status bat species. Consequently, the conclusions within the IS/MND are supported by substantial evidence and remain valid. Further roosting bat surveys of the site are not deemed necessary.

Considering that the site represents poor roosting habitat for individual bats, the likelihood that bats would use the site for a roosting colony is even more remote and unlikely. As noted above, the trees on-site are few in number, small, lack large/deep hollows are exposed to the elements, and are subject to regular disturbance from nearby development. Thus, the project site is not considered a suitable site for individual bats, let alone maternity colonies where large numbers of bats would congregate. Please refer to Response to Comment 4-4 for additional information regarding wildlife movement corridors.

Despite the low probability of the site providing roosting habitat for even individual hoary bats, if bats are present within the site, the pre-construction surveys required by Mitigation Measure IV-3 would include inspection of all on-site trees, which would allow for identification of any individual bats roosting within the site. Should such an identification occur, the identifying biologist would be able to recommend industry standard avoidance measures to ensure that removal of on-site trees would not affect the identified bat. However, because the site does not offer high quality habitat to bats, the potential for identification of bats on-site is low.

Response to Comment 3-8

As discussed throughout the Responses to Comment 3-1 through 3-7, the IS/MND considers the potential for species to occur within the project site and provides mitigation to ensure that any special-status species with the potential to occur within the site are identified and protected in accordance with all relevant regulations. The analysis and mitigation measures included in the IS/MND provide the public and decision makers with an adequate level of information regarding the potential impacts and the means of mitigation that would be necessary if the species are

identified. Thus, the analysis and conclusions presented within the IS/MND remain sound and justifiable.

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30 August 2020

RE: Vista Mar Project and Initial Study / Mitigated Negative Declaration

Dear Ms. O'Connor,

I write to comment on potential biological impacts of proposed residential development described in a biological resources report (WRA 2019) and an Initial Study / Mitigated Negative Declaration ("IS/MND") prepared for the Vista Mar site on the north side of Monterey Road, Pacifica. I understand the site is 1.2 acres according to the IS/MND or 1.3 acres according to WRA (2019). To prepare my comments, I also consulted eBird -- an online database of bird observations managed by the Cornell Lab of Ornithology, and iNaturalist -- another online data base of animal and plant observations. I also visited the site of the proposed project.

4-1

My qualifications for preparing expert comments are the following. I hold a Ph.D. degree in Ecology from the University of California at Davis, where I subsequently worked for four years as a post-graduate researcher in the Department of Agronomy and Range Sciences. My research has been on animal density and distribution, habitat selection, habitat restoration, interactions between wildlife and human infrastructure and activities, conservation of rare and endangered species, and on the ecology of invading species. I perform research on wildlife mortality caused by wind turbines, electric distribution lines, agricultural practices, and road traffic. I have authored numerous papers on special-status species issues. I served as Chair of the Conservation Affairs Committee for The Wildlife Society – Western Section. I am a member of The Wildlife Society and the Raptor Research Foundation, and I've been a part-time lecturer at California State University, Sacramento. I was an Associate Editor of wildlife biology's premier scientific journal, *The Journal of Wildlife Management*, as well as of *Biological Conservation*, and I was on the Editorial Board of *Environmental Management*. I have performed various types of wildlife surveys in California for thirty-four years, including at many proposed project sites. My CV is attached.

SITE VISIT

I visited the site of the proposed project several times over 1 hour and 52 minutes on 20 August 2020. I surveyed 45 minutes at 06:59 hours, 20 minutes at 12:16, 15 minutes at 14:43, and 32 minutes at 14:45. The early morning sky was covered in marine fog, but cleared by afternoon. The project site is patchily forested in Monterey pine, arroyo

4-1
Cont'd

willow, shrubs, and grassland (Photo 1). The arroyo willow grows along what appears to be a natural drainage. Trees on site have visible cavities, which serve as important refugia for bats and birds. Cavities had been excavated by woodpeckers. Nesting substrate is amply available. An animal trail extended uphill from the west end of the project and Monterey Road.

Photo 1. *View north (of the project site, 20 August 2020.*

During my visits, I detected 17 species of vertebrate wildlife on and around the project site (Table 1). Among other species, I detected red-tailed hawks (Photo 2), Anna's hummingbirds (Photo 3), California scrub-jays (Photo 4), and house finches (Photo 5). Only 1 species was non-native, indicating high ecological integrity (Smallwood 1994). I detected 4 species with special status (Table 1), including a pair of Allen's hummingbirds foraging on site, two species of raptor, and a double-crested cormorant that flew over.

Table 1. *Species of wildlife I observed during my site visit on 20 August 2020.*

4-1
Cont'd

Species	*Scientific name*	Status[1]	Note
Double-crested cormorant	*Phalacrocorax auritus*	TWL	Flyover
Turkey vulture	*Cathartes auratus*	FGC 3503.5	
Red-tailed hawk	*Buteo jamaicensis*	FGC 3503.5	
Herring gull	*Larus argentatus*		
Rock pigeon	*Columba livia*	Non-native	
Anna's hummingbird	*Calypte anna*		
Allen's hummingbird	*Selasphorus sasin*	BCC	
Black phoebe	*Sayornis nigricans*		
Chestnut-backed chickadee	*Poecile rufescens*		
California scrub-jay	*Aphelocoma californica*		
Common raven	*Corvus corax*		
American crow	*Corvus brachyrhynchos*		
Bewick's wren	*Thryomanes bewickii*		
Bushtit	*Psaltriparus minimus*		
California towhee	*Pipilo crissalis*		
House finch	*Carpodacus mexicanus*		
Western gray squirrel	*Sciurus griseus*		

[1] BCC = US Fish and Wildlife Service's Birds of Conservation Concern, FGC 3503.5 = California Department of Fish and Wildlife Code -- Birds of prey, TWL = CDFW Taxa to Watch List (Shuford and Gardali 2008).

Photos 2 and 3. *One of 3 red-tailed hawks I saw soar up the slope of the project site (left), and an Anna's hummingbird (right) chases a gnat on the project site, 20 August 2020. I observed this same foraging behavior repeated by multiple hummingbirds, including Allen's hummingbird, during my surveys.*

4-1
Cont'd

Photo 4. *One of at least 4 California scrub-jays on the project site, 20 August 2020.*

Photo 5. *One of multiple house finches on the project site, 20 August 2020.*

While I visited the site, residents stopped by to tell me they regularly see many birds there, and they told me a few of them. Another local sent me a list of an additional 46 species seen there, including California quail, Swanson's hawk, white-tailed kite, Cooper's hawk, American kestrel, peregrine falcon, western gull, mourning dove,

4-1 Cont'd

Eurasian collared-dove, great-horned owl, rufous hummingbird, northern flicker, downy woodpecker, hairy woodpecker, Pacific-slope flycatcher, Say's phoebe, pine siskin, red-breasted nuthatch, white-breasted nuthatch, brown creeper, wrentit, ruby-crowned kinglet, golden-crowned kinglet, cedar waxwing, Steller's jay, barn swallow, tree swallow, American robin, Swanson's thrush, California thrasher, Townsend's warbler, yellow-rumped warbler, Wilson's warbler, spotted towhee, fox sparrow, white-crowned sparrow, Lincoln's sparrow, grasshopper sparrow, golden-crowned sparrow, song sparrow, dark-eyed junco, red-winged blackbird, brown-headed cowbird, purple finch, American goldfinch, and lesser goldfinch. The project site hosts a healthy suite of native wildlife species, and is busy with birds.

BIOLOGICAL IMPACTS ASSESSMENT

WRA visited the site to perform reconnaissance-level surveys on the 2nd and 12th of July 2019. However, WRA (2019) did not report which biologists visited the site, nor how long they visited nor their arrival time. Not only were fundamental methods missing from the report, but so too were basic results. WRA (2019) did not list the species of wildlife they detected while on site. The reporting shortfalls impinge on the readers' assessment of WRA's likelihood of detecting wildlife or their ability to assess habitat of multiple special-status species.

Of the 47 special-status species of vertebrate wildlife I determined potentially use the site, at least on occasion (Table 2), WRA assessed the occurrence potential of only 21 (44%) of them. Compared to the species assessed by WRA (2019), sighting records in publicly available data bases indicate the potential likelihood of 26 additional species, 3 of which I detected at the site, and another 7 of which were detected by locals. Some of the species neglected by WRA are obvious candidates for using the site to breed, forage, or find refuge during migration. Examples include Cooper's hawk, sharp-shinned hawk, merlin, long-eared owl, loggerhead shrike, Lawrence's goldfinch, and various species of bats.

4-2

Of the 21 species in Table 2 that were addressed by WRA, WRA (2019) dismissed 17 (81%) as either having no occurrence potential or unlikely to use the site. I dismiss none of these 17 species as having the potential to use the site. In fact, I detected one of these species on site (double-crested cormorant). I detected three of them in Pacifica recently (peregrine falcon, yellow warbler and yellow-breasted chat). WRA (2019) determined that only four special-status species of wildife to have a moderate likelihood of occurrence – a determination that was unrealistic. Based on this, I consider the WRA (2019) report to be an inadequate assessment of species' occurrence likelihoods.

The project area includes 23 Heritage Trees. These and other trees displayed cavities excavated by woodpeckers, and they undoubtedly support nests of birds. All of these trees with their cavities and nests provide substrate for many other species of wildlife, including refugia for multiple special-status species of bats (Table 2; and see Kunz and Lumsden 2003). For all of the species listed in Table 2, the site provides more reasons to determine likely use of the site than reasons to determine unlikely use of the site.

4-2
Cont'd

Table 2. *Occurrence likelihoods of special-status species as determined by WRA (2019) and by sightings reported on data bases including eBird (https://eBird.org) and iNaturalist (https://www.inaturalist.org/observations) at or near the project site.* ***Bold*** *font under the 'Data bases' column indicates those species I detected, and italic font indicates those species observed by locals.*

Species	*Scientific name*	Status[1]	Occurrence likelihood	
			WRA 2019	Data bases
Double-crested cormorant	*Phalacrocorax auritus*	TWL	None	**Nearby**[2]
Red-tailed hawk	*Buteo jamaicensis*	FGC 3503.5		***On site***
Red-shouldered hawk	*Buteo lineatus*	FGC 3503.5		Nearby
Sharp-shinned hawk	*Accipiter striatus*	FGC 3503.5, TWL		Nearby
Cooper's hawk	*Accipiter cooperi*	FGC 3503.5, TWL		*Nearby*
Northern harrier	*Circus cyaneus*	SSC3, FGC 3503.5		Nearby
White-tailed kite	*Elanus leucurus*	CFP, TWL, FGC 3503.5	Moderate	*Nearby*
American kestrel	*Falco sparverius*	FGC 3503.5		*Nearby*
Merlin	*Falco columbarius*	FGC 3503.5, TWL		Nearby
Peregrine falcon	*Falco peregrinus*	CFP, BCC, FGC 3503.5	None	*Nearby*
Barn owl	*Tyto alba*	FGC 3503.5		Nearby
Great-horned owl	*Bubo virginianus*	FGC 3503.5		*Very close*
Long-eared owl	*Asio otus*	SSC3, FGC 3503.5		Regional
Western screech-owl	*Megascops kennicotti*	FGC 3503.5		Nearby
Vaux's swift	*Chaetura vauxi*	SCC2		Nearby
Allen's hummingbird	*Selasphorus sasin*	BCC	Moderate	***Nearby***[3]
Rufous hummingbird	*Selasphorus rufus*	BCC		*Nearby*
Nuttall's woodpecker	*Picoides nuttallii*	BCC	Unlikely	Nearby
Olive-sided flycatcher	*Contopus cooperi*	SSC2	Unlikely	Nearby
Willow flycatcher	*Empidonax traillii*	CE, BCC		Nearby
Oak titmouse	*Baeolophus inornatus*	BCC	Unlikely	Regional
Loggerhead shrike	*Lanius ludovicianus*	BCC, SSC2		Nearby
Purple martin	*Progne subis*	SCC2		Regional
Bank swallow	*Riparia riparia*	CT	None	Nearby
Yellow warbler	*Setophaga petechia*	SSC2, BCC	Unlikely	Nearby
Yellow-breasted chat	*Icteria virens*	SSC3	None	Nearby

4-2
Cont'd

Species	*Scientific name*	Status[1]	Occurrence likelihood	
			WRA 2019	Data bases
San Francisco common yellowthroat	*Geothlypis trichas sinuosa*	SSC3, BCC	None	Nearby
Bryant's savannah sparrow	*Passerculus sandwichensis alaudinus*	SSC3		Nearby
Tricolored blackbird	*Agelaius tricolor*	CT, BCC		Nearby
Lawrence's goldfinch	*Carduelis lawrencei*	BCC		Regional
California red-legged frog	*Rana draytonii*	FT, SSC	Unlikely	Nearby
Coast range newt	*Taricha torosa*	SSC		Regional
Western pond turtle	*Actinemys pallida*	SSC	None	Nearby
San Francisco garter snake	*Thamnophis sirtalis tetrataenia*	FE, CE, CFP	Unlikely	Nearby
Pallid bat	*Antrozous pallidus*	SSC	Unlikely	In range
Townsend's big-eared bat	*Corynorhinus townsendii*	SSC	Unlikely	In range
Western red bat	*Lasiurus blossevillii*	SSC	Unlikely	Nearby
Fringed myotis	*Myotis thysanodes*	WBWG: High	Unlikely	In range
Yuma myotis	*Myotis yumanesis*	WBWG: High		Nearby
Long-legged myotis	*Myotis volans*	WBWG: Mod		In range
Long-eared myotis	*Myotis evotis*	WBWG		In range
Western small-footed myotis	*Myotis cililabrum*	WBWG: Mod		In range
Hoary bat	*Lasiurus cinereus*	WBWG: Mod	Moderate[4]	Nearby
Ringtail	*Bassariscus astutus*	CFP		In range
American badger	*Taxidea taxus*	SSC	Unlikely	Nearby
Mountain lion	*Puma concolor*	SSC		Nearby
San Francisco dusky-footed woodrat	*Neotoma fuscipes annectens*	SSC	Moderate	Nearby

[1] Listed as FT = federally threatened, BCC = U.S. Fish and Wildlife Service Bird Species of Conservation Concern, CE or CT = California threatened or endangered, CFP = California Fully Protected (California Fish and Game Code 3511), SSC1, SSC2 and SSC3 = California Bird Species of Special Concern priorities 1, 2 and 3, respectively, and TWL = Taxa to Watch List (Shuford and Gardali 2008), and FGC 3503.5 = California Fish and Game Code 3503.5 (Birds of prey).
[2] I saw a double-crested cormorant fly over me and the project site while I visited the site.
[3] I saw a pair of Allen's hummingbirds on site.
[4] However, the IS/MND determines the likelihood of occurrence of hoary bat to be unlikely.

4-2 Cont'd

WRA (2019) and the IS/MND misleadingly report on the occurrence likelihoods of multiple special-status species. For example, after reporting that hoary bat had been detected nearby in 1955, both claim "*...recent occurrences have not been documented in the vicinity, indicating that the species may not currently be present in the area.*" In my expert opinion, a lack of recent occurrence records most certainly does not qualify as evidence of likely absense. Instead, it likely indicates lack of survey monitoring in the Pacifica area. California has few bat biologists, so lack of occurrence records anywhere in California is neither surprising nor indicative of occurrence likelihood. Unless WRA or City of Pacifica knows of long-term monitoring of hoary bats in and around Pacifica, it is inappropriate to rely on lack of occurrence records to determine absense.

Regarding hoary bat, the IS/MND adds, "*While the project site contains coniferous trees that may be suitable for roosting, the hoary bat typically likes to roost in more densely forested areas. Thus, the project site would not provide significant value as a roost site, and the project would not impact the species.*" After observing hoary bats many times over the last decade in the Altamont Pass, Alameda County -- where there are no conifer trees, I find the IS/MND conclusion absurd. Hoary bats, like other bats, will roost where they can (Kunz and Lumsden 2003). The IS/MND attempts to pigeon-hole the hoary bat into an artificially narrow portion of the environment in an effort to downplay its likelihood of occurrence on the project site.

In another example, WRA (2019) determines a low likelihood of occurrence of both San Francisco garter snake and California red-legged frog because the nearest suitable stream habitat is half a mile away and "*separated by movement barriers, including residential development and roadways.*" WRA (2019) offers no evidence and cites no source in support of this argument that roadways are movement barriers to either of these species. Furthermore, WRA (2019) neglects to mention that Manor Drive is the only road that separates known records of California red-legged frog and probably the records of San Francisco garter snake (locations of San Francisco garter snake were not provided by WRA 2019). There is only one row of houses on the north side of Manor Drive. A garter snake can cross this "barrier" in about half a minute, whereas a California red-legged frog would take a little longer.

Also not mentioned in WRA (2019) is the existence of a water detention basin on the north side of Manor Drive. There is no barrier of any kind between it and the project site. Before downplaying the occurrence likelihoods of San Francisco garter snake and California red-legged frog, this detention basin and its surrounds ought to be surveyed by qualified biologists and according to available detention survey protocols.

WRA (2019:C-26) further reasons that San Francisco garter snake is unlikely to occur at the project site because the site "*provides low-quality habitat overall for this species, because of the lack of ponds within 300 feet and the barriers to dispersal from suitable habitat*". WRA implies that the known occurrences are the only occurrences for this species, but WRA cannot know this to be true. WRA also implies that any place beyond 300 feet from ponds is unsuitable for the species – a threshold presented without any regard to the dispersal requirements of the species.

Even though the site does not include aquatic habitat elements used by western pond turtle, San Francisco garter snake and California red-legged frog, the site provides ample cover needed by members of these species for dispersal. And even though the site provides no foraging habitat for double-crested cormorants, it does provide opportunities for colony-nesting and roosting. And while I was at the site, at least one double-crested cormorant chose the site as part of its flight path. American badger was determined as unlikely, but I have found breeding dens of American badgers in dense vegetation complexes very much like that of the project site.

In another example, WRA (2019:C-25) explains that San Francisco common yellowthroat "*requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting,*" and concludes the species has no potential at the site because it lacks marsh. But dense stands of willows **are** available at the project site, and habitat for this species is broader than claimed by WRA. According to Cornell Lab of Ornithology (https://www.allaboutbirds.org/guide/Common_Yellowthroat/lifehistory), common yellowthroat habitat includes "*thick, tangled vegetation in a wide range of habitats—from wetlands to prairies to pine forests—across North America.*" And they live in "*dry upland pine forests, palmetto thickets, drainage ditches, hedgerows, orchards, fields, burned-over oak forests, shrub-covered hillsides, river edges, and disturbed sites.*" WRA pigeon-holes common yellowthroats into a narrow margin of the environment and then claims that margin does not exist on the project site. The same misleading tactic is applied to yellow warbler and yellow-breasted chat.

4-2 Cont'd

In the cases of yellow warbler, olive-sided flycatcher, and peregrine falcon, WRA (2019) further misleads by arguing the site might provide foraging habitat or stopover habitat during migration, but not nesting habitat. A distinction between nesting and foraging habitat, or between nesting and stopover habitat, is more contrivance than real, because no animals can successfully breed without also successfully foraging or migrating. To breed successfully, yellow warblers, olive-sided flycatchers, and peregrine falcons must find sufficient forage and they must survive migration and non-breeding seasons by finding suitable stopover habitat and all the other habitat elements needed. Arguing that the habitat value of a place used by a species is somehow lesser than those places specifically used for nesting is fallacious.

Habitat Loss

Neither WRA (2019) nor the IS/MND attempt to estimate the impacts of habitat loss on the reproductive or numerical capacities of special-status species. The impact of habitat loss on reproductive and numerical capacities can be predicted. Fortunately, studies have been done in environments where birds were abundant, similar to the situation at the project site. For example, a grassland/wetland/woodland complex at one study site had a total bird nesting density of 32.8 nests per acre (Young 1948). In another study on a similar complex of vegetation cover, the average annual nest density was 35.8 nests per acre (Yahner 1982). Averaged at 34.3 nests per acre, these densities multiplied

4-3

4-3 Cont'd

against the project's habitat loss of 1.3 acres would predict losses of 45 bird nests. These nest sites would be lost to California for as long as the project exists.

The average number of fledglings per nest in Young's (1948) study was 2.9. Assuming Young's (1948) study site was typical of bird productivity in similar environments, the project site would cease generating 131 new birds per year. After 100 years, the lost capacity of both breeders and annual chick production would total 14,900 birds, assuming an average generation time of 5 years ((nests/year × chicks/nest × number of years) + (2 adults/nest × nests/year × (number of years ÷ years/generation))). Given the loss of bird nests and loss of bird fledglings, it is my opinion that the project will result in potentially significant adverse biological impacts even with implementation of the proposed mitigation measures (discussed further below).

Wildlife Movement

4-4

According to the IS/MND, an analysis of a project's potential impacts on wildlife movement in a region depends on the project's impingement of the dimensions of wildlife movement corridors. The IS/MND adds that because the project site is not considered a wildife movement corridor, the project's impacts on wildife movement would be less-than-significant. However, the IS/MND introduces a false standard. The primary phrase of the CEQA standard goes to wildlife movement regardless of whether the movement is channeled by a corridor. A site such as the proposed project site is critically important for wildlife movement because it composes a diminishing patch of natural cover within a growing expanse of anthropogenic land uses, forcing more volant wildlife to use the site as stopover and staging habitat during migration, dispersal, and home range patrol (Warnock 2010, Taylor et al. 2011, Runge et al. 2014).

The project would not only remove habitat, but it would further fragment habitat, as acknowledged by the IS/MND (pp. 37-38).

During my site visit I noticed several groups of gulls, 3 red-tailed hawks, 5 turkey vultures, and several common ravens soar their way up the slope of the project site, from Monterey Road to the ridgecrest and beyond. Due to its orientation, the slope catches and deflects southwest winds. Having spent thousands of hours observing avian flight behaviors in response to wind and terrain (Smallwood et al. 2009a,b; Smallwood 2016a,b; Smallwood unpublished data), I am familiar with how soaring birds are benefitting from the open space on this particuar slope at and around the project site. Soaring birds are using the deflected winds up this slope to help power their flights inland from the coast. Due to habitat fragmentation, there are diminishing opportunities for birds to initiate inland-bound flights with help from wind and terrain.

And as I mentioned earlier, I noticed an animal trail leading up toward the top of the slope from Monterey Road. The trail was dusty and included indistinct tracks of multiple species. Not only are birds relying on the project site for movement in the region, but so also are terrestrial mammals.

4-4 Cont'd

Habitat loss and habitat fragmentation are widely recognized as the principal threats to most special-status species (Smallwood 2015). These threats factor into the recently reported 29% decline in overall avian abundance across North America over the last 48 years (Rosenberg et al. 2019). Rosenberg et al. (2019) also specifically reported that these and other threats act during both breeding and non-breeding seasons to reduce bird abundance. Any project that disrupts a species' ability to move between habitat patches will contribute to habitat fragmentation. A few of the species listed in Table 2, including tricolored blackbird and Bryant's savanna sparrow, might spend little time on the project site, but nevertheless can be adversely affected by the project's disruption of movement between breeding and foraging areas or along migration routes.

Given the elimination of a wildlife movement corridor and habitat fragmentation from the project, it is my opinion that the project will result in potentially significant adverse biological impacts even with implementation of the proposed mitigation measures.

Window Collisions

4-5

A prominent feature of the project plans depicted in the IS/MND (p. 19) is the abundant use of transparent and reflective glass windows. Based on depictions of the project in the IS/MND, I estimate the project would use at least 356 square meters (m^2) of glass on the building façades. Installed as proposed, where proposed, this glass would kill many birds, not only because of the types and extent of glass, but also because many birds are moving up the slope of the project site. I have developed a basis for robustly predicting wind-window collision mortality after reviewing reports of avian fatality monitoring among structures in a wide variety of environmental settings, types of structures, and types of glass on structural façades.

I have reviewed reports of bird collision monitoring at 181 buildings and façades for which bird collisions per m^2 of glass per year could be calculated and averaged (Johnson and Hudson 1976, O'Connell 2001, Somerlot 2003, Hager et al. 2008, Borden et al. 2010, Hager et al. 2013, Porter and Huang 2015, Parkins et al. 2015, Kahle et al. 2016, Ocampo-Peñuela et al. 2016, Sabo et al. 2016, Barton et al. 2017, Schneider et al. 2018). These study results averaged 0.077 bird deaths per m^2 of glass per year (95% CI: 0.04-0.11). This average and its 95% confidence interval provide a robust basis for predicting fatality rates at a proposed new project.

Renderings of the project in the IS/MND depict ample use of transparent and reflective windows. Looking over the drawings and a simulated view in the IS/MND, I estimate that the proposed structures would include at least 356 m^2 of glass windows, which applied to the mean fatality rate would predict **27.4 bird deaths per year (95% CI: 14.2-39.2)**. The 100-year toll from this average annual fatality rate would be **2,741 bird deaths (95% CI: 1,424-3,916)**, which would continue until the structures are either renovated to reduce bird collisions or they come down. The vast majority of these deaths would be of birds protected under the Migratory Bird Treaty Act and under the recently revised California Fish and Game Code section 3513, thus causing significant unmitigated impacts. Given the likely bird death from window collisions from the

4-5 Cont'd

project as currently designed, it is my opinion that the project will result in potentially significant adverse biological impacts even with implementation of the proposed mitigation measures.

Cumulative Impacts

4-6

The IS/MND provides no cumulative impacts analysis specific to biological resources, which is a shortfall of the CEQA review. The IS/MND does not even provide a list of existing and foreseeable projects that would contribute cumulative effects on wildlife. Furthermore, the IS/MND mischaracterizes cumulative impacts as merely residual impacts of mitigation that was incompletely effective between those measures formulated as part of the General Plan and specific to this project. If cumulative effects were indeed merely residual impacts of inadequate mitigation, then CEQA would require an inadequate mitigation analysis instead of a cumulative impacts analysis.

MITIGATION

I have also reviewed the following proposed IS/MND biological resource mitigation measures.

Measures IV-1 and IV-3: Preconstruction surveys for San Francisco dusky-footed woodrats and nesting birds

I understand that the IS/MND proposes to mitigate potentially significant impacts by having a biologist conduct pre-construction surveys (1) for all active woodrat stick nests that would be directly impacted by the proposed project, and (2) for nesting and migratory birds, including raptors, within 250 feet of the construction area no more than 14 days prior to initiation of construction activities.

4-7

Preconstruction surveys should be performed. However, it needs to be understood that preconstruction surveys, which are also often referred to as take-avoidance surveys, are really just last-minute salvage efforts to prevent injury or death of the most readily detectable individuals. Preconstruction surveys are limited in their mitigation effect as they detect only a small fraction of bird nests and special-status species occurring on a project site. Bird nests are usually concealed so that they are not discovered and their occupants destroyed by predators. Locating hummingbird nests, for example, can be nearly impossible. Preconstruction surveys alone fail to prevent the deaths of most of the animals at risk, nor do they do anything to prevent habitat destruction and lost reproductive capacity.

Preconstruction surveys perform better when they are informed by pre-project detection surveys, which have been carefully designed by species' experts and natural resource agency biologists. Detection surveys should precede preconstruction surveys, and they should also precede circulation of the environmental review documents intended to inform the public and decision-makers. This timing of detection surveys is needed not only to inform the preconstruction surveys, but also to provide the bases for impact

estimates and the formulation of mitigation measures, including compensatory mitigation for those impacts than cannot be avoided.

Recommended Measures

Pre-approval species detection surveys are needed to (1) support negative findings of species when appropriate, (2) inform preconstruction surveys to improve their efficacy, (3) estimate project impacts, and (4) inform mitigation, especially compensatory mitigation. Detection survey protocols and guidelines are available from resource agencies for most special-status species. Otherwise, professional standards can be learned from the scientific literature and species' experts.

Detection surveys are also needed for bats. No surveys were performed to detect bats at the site before circulation of the IS/MND, nor does the IS/MND propose that bat surveys be performed as any form of mitigation. The IS/MND essentially ignores bats, and does nothing to mitigate impacts to bats. I recommend that acoustic surveys with Sonobat be performed to identify which species of bats occur on site.

4-7 Cont'd

If the project goes forward, it should at a minimum adhere to available guidelines on building design intended to minimize collision hazards to birds. The American Bird Conservancy (ABC) produced an excellent set of guidelines recommending actions to: (1) Minimize use of glass; (2) Placing glass behind some type of screening (grilles, shutters, exterior shades); and (3) Using glass with inherent properties to reduce collisions, such as patterns, window films, decals or tape. The City of San Francisco (San Francisco Planning Department 2011) also has a set of building design guidelines, based on the excellent guidelines produced by the New York City Audubon Society (Orff et al. 2007). The ABC document and both the New York and San Francisco documents can alert planners of potential bird-collision hazards and provide many excellent visual examples of how to minimize them.

Appropriate wildlife habitat should be considered to protect habitat in perpetuity at another site, preferably near the project site. Habitat should be protected for nesting birds and for bats, San Francisco dusky-footed woodrat, and other special-status species.

Compensatory mitigation ought also to include funding contributions to wildlife rehabilitation facilities to cover the costs of injured birds that will be delivered to these facilities for care. The project's windows would injure birds, which home-owners should deliver to wildlife rehabilitation facilities for care. But the project's impacts can also be offset by funding the treatment of injuries to animals caused by other buildings, power lines, cars, and house cats.

CONCLUSIONS

4-8

Based on my education and experience, after review of the WRA (2019) report and IS/MND, my site visit, and consideration of wildlife observations maintained by the

4-8 Cont'd

Cornell Lab of Ornithology, iNaturalist and neighbors of the project site, it is my expert opinion that the project will result in potentially significant adverse biological impacts even with implementation of the proposed mitigation measures.

I base this conclusion on the flaws and inadequacies in the analysis of impacts and proposed mitigations discussed in the WRA (2019) report and IS/MND, as noted above.

More specifically, as discussed above, I base this conclusion on (1) the loss of bird nests and loss of bird fledglings from habitat loss, (2) interference with wildlife movement in the region, (3) habitat fragmentation, and (4) likely bird death from window collisions from the project.

In my opinion, this project would benefit from preparation of an Environmental Impact Report which analyzes impacts to each of the species in Table 2 above, and formulation of appropropriate biological mitigation measures. As discussed above, an EIR should include a cumulative biological resource impact analysis.

Thank you for your attention to these comments.

Shawn Smallwood, Ph.D.

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Curriculum Vitae

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Born May 3, 1963 in
Sacramento, California.
Married, father of two.

Ecologist

Expertise

- Finding solutions to controversial problems related to wildlife interactions with human industry, infrastructure, and activities;
- Wildlife monitoring and field study using GPS, thermal imaging, behavior surveys;
- Using systems analysis and experimental design principles to identify meaningful ecological patterns that inform management decisions.

Education

Ph.D. Ecology, University of California, Davis. September 1990.
M.S. Ecology, University of California, Davis. June 1987.
B.S. Anthropology, University of California, Davis. June 1985.
Corcoran High School, Corcoran, California. June 1981.

Experience

- 486 professional publications, including:
- 88 peer reviewed publications
- 24 in non-reviewed proceedings
- 372 reports, declarations, posters and book reviews
- 8 in mass media outlets
- 87 public presentations of research results

Editing for scientific journals: Guest Editor, *Wildlife Society Bulletin*, 2012-2013, of invited papers representing international views on the impacts of wind energy on wildlife and how to mitigate the impacts. Associate Editor, *Journal of Wildlife Management*, March 2004 to 30 June 2007. Editorial Board Member, *Environmental Management*, 10/1999 to 8/2004. Associate Editor, *Biological Conservation*, 9/1994 to 9/1995.

Member, Alameda County Scientific Review Committee (SRC), August 2006 to April 2011. The five-member committee investigated causes of bird and bat collisions in the Altamont Pass Wind Resource Area, and recommended mitigation and monitoring measures. The SRC reviewed the science underlying the Alameda County Avian Protection Program, and advised

the County on how to reduce wildlife fatalities.

Consulting Ecologist, 2004-2007, California Energy Commission (CEC). Provided consulting services as needed to the CEC on renewable energy impacts, monitoring and research, and produced several reports. Also collaborated with Lawrence-Livermore National Lab on research to understand and reduce wind turbine impacts on wildlife.

Consulting Ecologist, 1999-2013, U.S. Navy. Performed endangered species surveys, hazardous waste site monitoring, and habitat restoration for the endangered San Joaquin kangaroo rat, California tiger salamander, California red-legged frog, California clapper rail, western burrowing owl, salt marsh harvest mouse, and other species at Naval Air Station Lemoore; Naval Weapons Station, Seal Beach, Detachment Concord; Naval Security Group Activity, Skaggs Island; National Radio Transmitter Facility, Dixon; and, Naval Outlying Landing Field Imperial Beach.

Part-time Lecturer, 1998-2005, California State University, Sacramento. Instructed Mammalogy, Behavioral Ecology, and Ornithology Lab, Contemporary Environmental Issues, Natural Resources Conservation.

Senior Ecologist, 1999-2005, BioResource Consultants. Designed and implemented research and monitoring studies related to avian fatalities at wind turbines, avian electrocutions on electric distribution poles across California, and avian fatalities at transmission lines.

Chairman, Conservation Affairs Committee, The Wildlife Society--Western Section, 1999-2001. Prepared position statements and led efforts directed toward conservation issues, including travel to Washington, D.C. to lobby Congress for more wildlife conservation funding.

Systems Ecologist, 1995-2000, Institute for Sustainable Development. Headed ISD's program on integrated resources management. Developed indicators of ecological integrity for large areas, using remotely sensed data, local community involvement and GIS.

Associate, 1997-1998, Department of Agronomy and Range Science, University of California, Davis. Worked with Shu Geng and Mingua Zhang on several studies related to wildlife interactions with agriculture and patterns of fertilizer and pesticide residues in groundwater across a large landscape.

Lead Scientist, 1996-1999, National Endangered Species Network. Informed academic scientists and environmental activists about emerging issues regarding the Endangered Species Act and other environmental laws. Testified at public hearings on endangered species issues.

Ecologist, 1997-1998, Western Foundation of Vertebrate Zoology. Conducted field research to determine the impact of past mercury mining on the status of California red-legged frogs in Santa Clara County, California.

Senior Systems Ecologist, 1994-1995, EIP Associates, Sacramento, California. Provided consulting services in environmental planning, and quantitative assessment of land units for their conservation and restoration opportunities basedon ecological resource requirements of 29 special-status species. Developed ecological indicators for prioritizing areas within Yolo County

to receive mitigation funds for habitat easements and restoration.

Post-Graduate Researcher, 1990-1994, Department of Agronomy and Range Science, *U.C. Davis*. Under Dr. Shu Geng's mentorship, studied landscape and management effects on temporal and spatial patterns of abundance among pocket gophers and species of Falconiformes and Carnivora in the Sacramento Valley. Managed and analyzed a data base of energy use in California agriculture. Assisted with landscape (GIS) study of groundwater contamination across Tulare County, California.

Work experience in graduate school: Co-taught Conservation Biology with Dr. Christine Schonewald, 1991 & 1993, UC Davis Graduate Group in Ecology; Reader for Dr. Richard Coss's course on Psychobiology in 1990, UC Davis Department of Psychology; Research Assistant to Dr. Walter E. Howard, 1988-1990, UC Davis Department of Wildlife and Fisheries Biology, testing durable baits for pocket gopher management in forest clearcuts; Research Assistant to Dr. Terrell P. Salmon, 1987-1988, UC Wildlife Extension, Department of Wildlife and Fisheries Biology, developing empirical models of mammal and bird invasions in North America, and a rating system for priority research and control of exotic species based on economic, environmental and human health hazards in California. Student Assistant to Dr. E. Lee Fitzhugh, 1985-1987, UC Cooperative Extension, Department of Wildlife and Fisheries Biology, developing and implementing statewide mountain lion track count for long-term monitoring.

Fulbright Research Fellow, Indonesia, 1988. Tested use of new sampling methods for numerical monitoring of Sumatran tiger and six other species of endemic felids, and evaluated methods used by other researchers.

Projects

Repowering wind energy projects through careful siting of new wind turbines using map-based collision hazard models to minimize impacts to volant wildlife. Funded by wind companies (principally NextEra Renewable Energy, Inc.), California Energy Commission and East Bay Regional Park District, I have collaborated with a GIS analyst and managed a crew of five field biologists performing golden eagle behavior surveys and nocturnal surveys on bats and owls. The goal is to quantify flight patterns for development of predictive models to more carefully site new wind turbines in repowering projects. Focused behavior surveys began May 2012 and continue. Collision hazard models have been prepared for seven wind projects, three of which were built. Planning for additional repowering projects is underway.

Test avian safety of new mixer-ejector wind turbine (MEWT). Designed and implemented a before-after, control-impact experimental design to test the avian safety of a new, shrouded wind turbine developed by Ogin Inc. (formerly known as FloDesign Wind Turbine Corporation). Supported by a $718,000 grant from the California Energy Commission's Public Interest Energy Research program and a 20% match share contribution from Ogin, I managed a crew of seven field biologists who performed periodic fatality searches and behavior surveys, carcass detection trials, nocturnal behavior surveys using a thermal camera, and spatial analyses with the collaboration of a GIS analyst. Field work began 1 April 2012 and ended 30 March 2015 without Ogin installing its MEWTs, but we still achieved multiple important scientific advances.

Reduce avian mortality due to wind turbines at Altamont Pass. Studied wildlife impacts caused by 5,400 wind turbines at the world's most notorious wind resource area. Studied how impacts are perceived by monitoring and how they are affected by terrain, wind patterns, food resources, range management practices, wind turbine operations, seasonal patterns, population cycles, infrastructure management such as electric distribution, animal behavior and social interactions.

Reduce avian mortality on electric distribution poles. Directed research toward reducing bird electrocutions on electric distribution poles, 2000-2007. Oversaw 5 founds of fatality searches at 10,000 poles from Orange County to Glenn County, California, and produced two large reports.

Cook *et al.* v. Rockwell International *et al.*, No. 90-K-181 (D. Colorado). Provided expert testimony on the role of burrowing animals in affecting the fate of buried and surface-deposited radioactive and hazardous chemical wastes at the Rocky Flats Plant, Colorado. Provided expert reports based on four site visits and an extensive document review of burrowing animals. Conducted transect surveys for evidence of burrowing animals and other wildlife on and around waste facilities. Discovered substantial intrusion of waste structures by burrowing animals. I testified in federal court in November 2005, and my clients were subsequently awarded a $553,000,000 judgment by a jury. After appeals the award was increased to two billion dollars.

Hanford Nuclear Reservation Litigation. Provided expert testimony on the role of burrowing animals in affecting the fate of buried radioactive wastes at the Hanford Nuclear Reservation, Washington. Provided three expert reports based on three site visits and extensive document review. Predicted and verified a certain population density of pocket gophers on buried waste structures, as well as incidence of radionuclide contamination in body tissue. Conducted transect surveys for evidence of burrowing animals and other wildlife on and around waste facilities. Discovered substantial intrusion of waste structures by burrowing animals.

Expert testimony and declarations on proposed residential and commercial developments, gas-fired power plants, wind, solar and geothermal projects, water transfers and water transfer delivery systems, endangered species recovery plans, Habitat Conservation Plans and Natural Communities Conservation Programs. Testified before multiple government agencies, Tribunals, Boards of Supervisors and City Councils, and participated with press conferences and depositions. Prepared expert witness reports and court declarations, which are summarized under Reports (below).

Protocol-level surveys for special-status species. Used California Department of Fish and Wildlife and US Fish and Wildlife Service protocols to search for California red-legged frog, California tiger salamander, arroyo southwestern toad, blunt-nosed leopard lizard, western pond turtle, giant kangaroo rat, San Joaquin kangaroo rat, San Joaquin kit fox, western burrowing owl, Swainson's hawk, Valley elderberry longhorn beetle and other special-status species.

Conservation of San Joaquin kangaroo rat. Performed research to identify factors responsible for the decline of this endangered species at Lemoore Naval Air Station, 2000-2013, and implemented habitat enhancements designed to reverse the trend and expand the population.

Impact of West Nile Virus on yellow-billed magpies. Funded by Sacramento-Yolo Mosquito and Vector Control District, 2005-2008, compared survey results pre- and post-West Nile Virus epidemic for multiple bird species in the Sacramento Valley, particularly on yellow-billed magpie and American crow due to susceptibility to WNV.

Workshops on HCPs. Assisted Dr. Michael Morrison with organizing and conducting a 2-day workshop on Habitat Conservation Plans, sponsored by Southern California Edison, and another 1-day workshop sponsored by PG&E. These Workshops were attended by academics, attorneys, and consultants with HCP experience. We guest-edited a Proceedings published in Environmental Management.

Mapping of biological resources along Highways 101, 46 and 41. Used GPS and GIS to delineate vegetation complexes and locations of special-status species along 26 miles of highway in San Luis Obispo County, 14 miles of highway and roadway in Monterey County, and in a large area north of Fresno, including within reclaimed gravel mining pits.

GPS mapping and monitoring at restoration sites and at Caltrans mitigation sites. Monitored the success of elderberry shrubs at one location, the success of willows at another location, and the response of wildlife to the succession of vegetation at both sites. Also used GPS to monitor the response of fossorial animals to yellow star-thistle eradication and natural grassland restoration efforts at Bear Valley in Colusa County and at the decommissioned Mather Air Force Base in Sacramento County.

Mercury effects on Red-legged Frog. Assisted Dr. Michael Morrison and US Fish and Wildlife Service in assessing the possible impacts of historical mercury mining on the federally listed California red-legged frog in Santa Clara County. Also measured habitat variables in streams.

Opposition to proposed No Surprises rule. Wrote a white paper and summary letter explaining scientific grounds for opposing the incidental take permit (ITP) rules providing ITP applicants and holders with general assurances they will be free of compliance with the Endangered Species Act once they adhere to the terms of a "properly functioning HCP." Submitted 188 signatures of scientists and environmental professionals concerned about No Surprises rule US Fish and Wildlife Service, National Marine Fisheries Service, all US Senators.

Natomas Basin Habitat Conservation Plan alternative. Designed narrow channel marsh to increase the likelihood of survival and recovery in the wild of giant garter snake, Swainson's hawk and Valley Elderberry Longhorn Beetle. The design included replication and interspersion of treatments for experimental testing of critical habitat elements. I provided a report to Northern Territories, Inc.

Assessments of agricultural production system and environmental technology transfer to China. Twice visited China and interviewed scientists, industrialists, agriculturalists, and the Directors of the Chinese Environmental Protection Agency and the Department of Agriculture to assess the need and possible pathways for environmental clean-up technologies and trade opportunities between the US and China.

Yolo County Habitat Conservation Plan. Conducted landscape ecology study of Yolo County to spatially prioritize allocation of mitigation efforts to improve ecosystem functionality within the County from the perspective of 29 special-status species of wildlife and plants. Used a hierarchically structured indicators approach to apply principles of landscape and ecosystem ecology, conservation biology, and local values in rating land units. Derived GIS maps to help guide the conservation area design, and then developed implementation strategies.

Mountain lion track count. Developed and conducted a carnivore monitoring program throughout California since 1985. Species counted include mountain lion, bobcat, black bear, coyote, red and gray fox, raccoon, striped skunk, badger, and black-tailed deer. Vegetation and land use are also monitored. Track survey transect was established on dusty, dirt roads within randomly selected quadrats.

Sumatran tiger and other felids. Upon award of Fulbright Research Fellowship, I designed and initiated track counts for seven species of wild cats in Sumatra, including Sumatran tiger, fishing cat, and golden cat. Spent four months on Sumatra and Java in 1988, and learned Bahasa Indonesia, the official Indonesian language.

Wildlife in agriculture. Beginning as post-graduate research, I studied pocket gophers and other wildlife in 40 alfalfa fields throughout the Sacramento Valley, and I surveyed for wildlife along a 200 mile road transect since 1989 with a hiatus of 1996-2004. The data are analyzed using GIS and methods from landscape ecology, and the results published and presented orally to farming groups in California and elsewhere. I also conducted the first study of wildlife in cover crops used on vineyards and orchards.

Agricultural energy use and Tulare County groundwater study. Developed and analyzed a data base of energy use in California agriculture, and collaborated on a landscape (GIS) study of groundwater contamination across Tulare County, California.

Pocket gopher damage in forest clear-cuts. Developed gopher sampling methods and tested various poison baits and baiting regimes in the largest-ever field study of pocket gopher management in forest plantations, involving 68 research plots in 55 clear-cuts among 6 National Forests in northern California.

Risk assessment of exotic species in North America. Developed empirical models of mammal and bird species invasions in North America, as well as a rating system for assigning priority research and control to exotic species in California, based on economic, environmental, and human health hazards.

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Comments on Environmental Documents

I was retained or commissioned to comment on environmental planning and review documents, including:

- The Villages of Lakeview EIR (2017; 28 pp);
- Notes on Proposed Study Options for Trail Impacts on Northern Spotted Owl (2017; 4 pp);
- San Gorgonio Crossings EIR (2017; 22 pp);
- Replies to responses on Jupiter Project IS and MND (2017; 12 pp);
- MacArthur Transit Village Project Modified 2016 CEQA Analysis (2017; 12 pp);
- Central SoMa Plan DEIR (2017; 14 pp);
- Colony Commerce Center Specific Plan DEIR (2016; 16 pp);
- Fairway Trails Improvements MND (2016; 13 pp);
- Review of Avian-Solar Science Plan (2016; 28 pp);

- Replies to responses on Initial Study for Pyramid Asphalt (2016; 5 pp);
- Initial Study for Pyramid Asphalt (2016; 4 pp);
- Agua Mansa Distribution Warehouse Project Initial Study (2016; 14 pp);
- Santa Anita Warehouse IS and MND (2016; 12 pp);
- CapRock Distribution Center III DEIR (2016: 12 pp);
- Orange Show Logistics Center Initial Study and MND (2016; 9 pp);
- City of Palmdale Oasis Medical Village Project IS and MND (2016; 7 pp);
- Comments on proposed rule for incidental eagle take (2016, 49 pp);
- Grapevine Specific and Community Plan FEIR (2016; 25 pp);
- Grapevine Specific and Community Plan DEIR (2016; 15 pp);
- Clinton County Zoning Ordinance for Wind Turbine siting (2016);
- Hallmark at Shenandoah Warehouse Project Initial Study (2016; 6 pp);
- Tri-City Industrial Complex Initial Study (2016; 5 pp);
- Hidden Canyon Industrial Park Plot Plan 16-PP-02 (2016; 12 pp);
- Kimball Business Park DEIR (2016; 10 pp);
- Jupiter Project IS and MND (2016; 9 pp);
- Revised Draft Giant Garter Snake Recovery Plan of 2015 (2016, 18 pp);
- Palo Verde Mesa Solar Project Draft Environmental Impact Report (2016; 27 pp);
- Reply Witness Statement on Fairview Wind Project, Ontario, Canada (2016; 14 pp);
- Fairview Wind Project, Ontario, Canada (2016; 41 pp);
- Supplementary Reply Witness Statement Amherst Island Wind Farm, Ontario (2015, 38 pp);
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- Second Reply Witness Statement on White Pines Wind Farm, Ontario (2015, 6 pp);
- Reply Witness Statement on White Pines Wind Farm, Ontario (2015, 10 pp);
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- Proposed Section 24 Specific Plan Agua Caliente Band of Cahuilla Indians DEIS (2015, 9 pp);
- Replies to comments 24 Specific Plan Agua Caliente Band of Cahuilla Indians FEIS (2015, 6 pp);
- Willow Springs Solar Photovoltaic Project DEIR (2015; 28 pp);
- Sierra Lakes Commerce Center Project DEIR (2015, 9 pp);
- Columbia Business Center MND (2015; 8 pp);
- West Valley Logistics Center Specific Plan DEIR (2015, 10 pp);
- World Logistic Center Specific Plan FEIR (2015, 12 pp);
- Bay Delta Conservation Plan EIR/EIS (2014, 21 pp);
- Addison Wind Energy Project DEIR (2014, 32 pp);
- Response to Comments on the Addison Wind Energy Project DEIR (2014, 15 pp);
- Addison and Rising Tree Wind Energy Project FEIR (2014, 12 pp);
- Alta East Wind Energy Project FEIS (2013, 23 pp);
- Blythe Solar Power Project Staff Assessment, California Energy Commission (2013, 16 pp);
- Clearwater and Yakima Solar Projects DEIR (2013, 9 pp);
- Cuyama Solar Project DEIR (2014, 19 pp);
- Draft Desert Renewable Energy Conservation Plan (DRECP) EIR/EIS (2015, 49 pp);
- Kingbird Solar Photovoltaic Project EIR (2013, 19 pp);

- Lucerne Valley Solar Project Initial Study & Mitigated Negative Declaration (2013, 12 pp);
- Palen Solar Electric Generating System Final Staff Assessment of California Energy Commission, (2014, 20 pp);
- Rebuttal testimony on Palen Solar Energy Generating System (2014, 9 pp);
- Rising Tree Wind Energy Project DEIR (2014, 32 pp);
- Response to Comments on the Rising Tree Wind Energy Project DEIR (2014, 15 pp);
- Soitec Solar Development Project Draft PEIR (2014, 18 pp);
- Comment on the Biological Opinion (08ESMF-00-2012-F-0387) of Oakland Zoo expansion on Alameda whipsnake and California red-legged frog (2014; 3 pp);
- West Antelope Solar Energy Project Initial Study and Negative Declaration (2013, 18 pp);
- Willow Springs Solar Photovoltaic Project DEIR (2015, 28 pp);
- Alameda Creek Bridge Replacement Project DEIR (2015, 10 pp);
- Declaration on Tule Wind project FEIR/FEIS (2013; 24 pp);
- Sunlight Partners LANDPRO Solar Project Mitigated Negative Declaration (2013; 11 pp);
- Declaration in opposition to BLM fracking (2013; 5 pp);
- Rosamond Solar Project Addendum EIR (2013; 13 pp);
- Pioneer Green Solar Project EIR (2013; 13 pp);
- Reply to Staff Responses to Comments on Soccer Center Solar Project Mitigated Negative Declaration (2013; 6 pp);
- Soccer Center Solar Project Mitigated Negative Declaration (2013; 10 pp);
- Plainview Solar Works Mitigated Negative Declaration (2013; 10 pp);
- Reply to the County Staff's Responses on comments to Imperial Valley Solar Company 2 Project (2013; 10 pp);
- Imperial Valley Solar Company 2 Project (2013; 13 pp);
- FRV Orion Solar Project DEIR (PP12232) (2013; 9 pp);
- Casa Diablo IV Geothermal Development Project (3013; 6 pp);
- Reply to Staff Responses to Comments on Casa Diablo IV Geothermal Development Project (2013; 8 pp);
- FEIS prepared for Alta East Wind Project (2013; 23 pp);
- Metropolitan Air Park DEIR, City of San Diego (2013;);
- Davidon Homes Tentative Subdivision Map and Rezoning Project DEIR (2013; 9 pp);
- Analysis of Biological Assessment of Oakland Zoo Expansion Impacts on Alameda Whipsnake (2013; 10 pp);
- Declaration on Campo Verde Solar project FEIR (2013; 11pp);
- Neg Dec comments on Davis Sewer Trunk Rehabilitation (2013; 8 pp);
- Declaration on North Steens Transmission Line FEIS (2012; 62 pp);
- City of Lancaster Revised Initial Study for Conditional Use Permits 12-08 and 12-09, Summer Solar and Springtime Solar Projects (2012; 8 pp);
- J&J Ranch, 24 Adobe Lane Environmental Review (2012; 14 pp);
- Reply to the County Staff's Responses on comments to Hudson Ranch Power II Geothermal Project and the Simbol Calipatria Plant II (2012; 8 pp);
- Hudson Ranch Power II Geothermal Project and the Simbol Calipatria Plant II (2012; 9 pp);
- Desert Harvest Solar Project EIS (2012; 15 pp);
- Solar Gen 2 Array Project DEIR (2012; 16 pp);
- Ocotillo Sol Project EIS (2012; 4 pp);

- Beacon Photovoltaic Project DEIR (2012; 5 pp);
- Declaration on Initial Study and Proposed Negative Declaration for the Butte Water District 2012 Water Transfer Program (2012; 11 pp);
- Mount Signal and Calexico Solar Farm Projects DEIR (2011; 16 pp);
- City of Elk Grove Sphere of Influence EIR (2011; 28 pp);
- Comment on Sutter Landing Park Solar Photovoltaic Project MND (2011; 9 pp);
- Statement of Shawn Smallwood, Ph.D. Regarding Proposed Rabik/Gudath Project, 22611 Coleman Valley Road, Bodega Bay (CPN 10-0002) (2011; 4 pp);
- Declaration of K. Shawn Smallwood on Biological Impacts of the Ivanpah Solar Electric Generating System (ISEGS) (2011; 9 pp);
- Comments on Draft Eagle Conservation Plan Guidance (2011; 13 pp);
- Comments on Draft EIR/EA for Niles Canyon Safety Improvement Project (2011; 16 pp);
- Declaration of K. Shawn Smallwood, Ph.D., on Biological Impacts of the Route 84 Safety Improvement Project (2011; 7 pp);
- Rebuttal Testimony of Witness #22, K. Shawn Smallwood, Ph.D, on Behalf of Intervenors Friends of The Columbia Gorge & Save Our Scenic Area (2010; 6 pp);
- Prefiled Direct Testimony of Witness #22, K. Shawn Smallwood, Ph.D, on Behalf of Intervenors Friends of the Columbia Gorge & Save Our Scenic Area. Comments on Whistling Ridge Wind Energy Power Project DEIS, Skamania County, Washington (2010; 41 pp);
- Evaluation of Klickitat County's Decisions on the Windy Flats West Wind Energy Project (2010; 17 pp);
- St. John's Church Project Draft Environmental Impact Report (2010; 14 pp.);
- Initial Study/Mitigated Negative Declaration for Results Radio Zone File #2009-001 (2010; 20 pp);
- Rio del Oro Specific Plan Project Final Environmental Impact Report (2010;12 pp);
- Answers to Questions on 33% RPS Implementation Analysis Preliminary Results Report (2009: 9 pp);
- SEPA Determination of Non-significance regarding zoning adjustments for Skamania County, Washington. Second Declaration to Friends of the Columbia Gorge, Inc. and Save Our Scenic Area (Dec 2008; 17 pp);
- Comments on Draft 1A Summary Report to CAISO (2008; 10 pp);
- County of Placer's Categorical Exemption of Hilton Manor Project (2009; 9 pp);
- Protest of CARE to Amendment to the Power Purchase and Sale Agreement for Procurement of Eligible Renewable Energy Resources Between Hatchet Ridge Wind LLC and PG&E (2009; 3 pp);
- Tehachapi Renewable Transmission Project EIR/EIS (2009; 142 pp);
- Delta Shores Project EIR, south Sacramento (2009; 11 pp + addendum 2 pp);
- Declaration of Shawn Smallwood in Support of Care's Petition to Modify D.07-09-040 (2008; 3 pp);
- The Public Utility Commission's Implementation Analysis December 16 Workshop for the Governor's Executive Order S-14-08 to implement a 33% Renewable Portfolio Standard by 2020 (2008; 9 pp);
- The Public Utility Commission's Implementation Analysis Draft Work Plan for the Governor's Executive Order S-14-08 to implement a 33% Renewable Portfolio Standard by 2020 (2008; 11 pp);

- Draft 1A Summary Report to California Independent System Operator for Planning Reserve Margins (PRM) Study (2008; 7 pp.);
- SEPA Determination of Non-significance regarding zoning adjustments for Skamania County, Washington. Declaration to Friends of the Columbia Gorge, Inc. and Save Our Scenic Area (Sep 2008; 16 pp);
- California Energy Commission's Preliminary Staff Assessment of the Colusa Generating Station (2007; 24 pp);
- Rio del Oro Specific Plan Project Recirculated Draft Environmental Impact Report (2008: 66 pp);
- Replies to Response to Comments Re: Regional University Specific Plan Environmental Impact Report (2008; 20 pp);
- Regional University Specific Plan Environmental Impact Report (2008: 33 pp.);
- Clark Precast, LLC's "Sugarland" project, Negative Declaration (2008: 15 pp.);
- Cape Wind Project Draft Environmental Impact Statement (2008; 157 pp.);
- Yuba Highlands Specific Plan (or Area Plan) Environmental Impact Report (2006; 37 pp.);
- Replies to responses to comments on Mitigated Negative Declaration of the proposed Mining Permit (MIN 04-01) and Modification of Use Permit 96-02 at North Table Mountain (2006; 5 pp);
- Mitigated Negative Declaration of the proposed Mining Permit (MIN 04-01) and Modification of Use Permit 96-02 at North Table Mountain (2006; 15 pp);
- Windy Point Wind Farm Environmental Review and EIS (2006; 14 pp and 36 Powerpoint slides in reply to responses to comments);
- Shiloh I Wind Power Project EIR (2005; 18 pp);
- Buena Vista Wind Energy Project Notice of Preparation of EIR (2004; 15 pp);
- Negative Declaration of the proposed Callahan Estates Subdivision (2004; 11 pp);
- Negative Declaration of the proposed Winters Highlands Subdivision (2004; 9 pp);
- Negative Declaration of the proposed Winters Highlands Subdivision (2004; 13 pp);
- Negative Declaration of the proposed Creekside Highlands Project, Tract 7270 (2004; 21 pp);
- On the petition California Fish and Game Commission to list the Burrowing Owl as threatened or endangered (2003; 10 pp);
- Conditional Use Permit renewals from Alameda County for wind turbine operations in the Altamont Pass Wind Resource Area (2003; 41 pp);
- UC Davis Long Range Development Plan of 2003, particularly with regard to the Neighborhood Master Plan (2003; 23 pp);
- Anderson Marketplace Draft Environmental Impact Report (2003: 18 pp + 3 plates of photos);
- Negative Declaration of the proposed expansion of Temple B'nai Tikyah (2003: 6 pp);
- Antonio Mountain Ranch Specific Plan Public Draft EIR (2002: 23 pp);
- Response to testimony of experts at the East Altamont Energy Center evidentiary hearing on biological resources (2002: 9 pp);
- Revised Draft Environmental Impact Report, The Promenade (2002: 7 pp);
- Recirculated Initial Study for Calpine's proposed Pajaro Valley Energy Center (2002: 3 pp);
- UC Merced -- Declaration of Dr. Shawn Smallwood in support of petitioner's application for temporary restraining order and preliminary injunction (2002: 5 pp);
- Replies to response to comments in Final Environmental Impact Report, Atwood Ranch

Unit III Subdivision (2003: 22 pp);
- Draft Environmental Impact Report, Atwood Ranch Unit III Subdivision (2002: 19 pp + 8 photos on 4 plates);
- California Energy Commission Staff Report on GWF Tracy Peaker Project (2002: 17 pp + 3 photos; follow-up report of 3 pp);
- Initial Study and Negative Declaration, Silver Bend Apartments, Placer County (2002: 13 pp);
- UC Merced Long-range Development Plan DEIR and UC Merced Community Plan DEIR (2001: 26 pp);
- Initial Study, Colusa County Power Plant (2001: 6 pp);
- Comments on Proposed Dog Park at Catlin Park, Folsom, California (2001: 5 pp + 4 photos);
- Pacific Lumber Co. (Headwaters) Habitat Conservation Plan and Environmental Impact Report (1998: 28 pp);
- Final Environmental Impact Report/Statement for Issuance of Take authorization for listed species within the MSCP planning area in San Diego County, California (Fed. Reg. 62 (60): 14938, San Diego Multi-Species Conservation Program) (1997: 10 pp);
- Permit (PRT-823773) Amendment for the Natomas Basin Habitat Conservation Plan, Sacramento, CA (Fed. Reg. 63 (101): 29020-29021) (1998);
- Draft Recovery Plan for the Giant Garter Snake (*Thamnophis gigas*). (Fed. Reg. 64(176): 49497-49498) (1999: 8 pp);
- Review of the Draft Recovery Plan for the Arroyo Southwestern Toad (*Bufo microscaphus californicus*) (1998);
- Ballona West Bluffs Project Environmental Impact Report (1999: oral presentation);
- California Board of Forestry's proposed amended Forest Practices Rules (1999);
- Negative Declaration for the Sunset Skyranch Airport Use Permit (1999);
- Calpine and Bechtel Corporations' Biological Resources Implementation and Monitoring Program (BRMIMP) for the Metcalf Energy Center (2000: 10 pp);
- California Energy Commission's Final Staff Assessment of the proposed Metcalf Energy Center (2000);
- US Fish and Wildlife Service Section 7 consultation with the California Energy Commission regarding Calpine and Bechtel Corporations' Metcalf Energy Center (2000: 4 pp);
- California Energy Commission's Preliminary Staff Assessment of the proposed Metcalf Energy Center (2000: 11 pp);
- Site-specific management plans for the Natomas Basin Conservancy's mitigation lands, prepared by Wildlands, Inc. (2000: 7 pp);
- Affidavit of K. Shawn Smallwood in Spirit of the Sage Council, et al. (Plaintiffs) vs. Bruce Babbitt, Secretary, U.S. Department of the Interior, et al. (Defendants), Injuries caused by the No Surprises policy and final rule which codifies that policy (1999: 9 pp).

Comments on other Environmental Review Documents:

- Proposed Regulation for California Fish and Game Code Section 3503.5 (2015: 12 pp);
- Statement of Overriding Considerations related to extending Altamont Winds, Inc.'s Conditional Use Permit PLN2014-00028 (2015; 8 pp);
- Draft Program Level EIR for Covell Village (2005; 19 pp);

- Bureau of Land Management Wind Energy Programmatic EIS Scoping document (2003: 7 pp.);
- NEPA Environmental Analysis for Biosafety Level 4 National Biocontainment Laboratory (NBL) at UC Davis (2003: 7 pp);
- Notice of Preparation of UC Merced Community and Area Plan EIR, on behalf of The Wildlife Society—Western Section (2001: 8 pp.);
- Preliminary Draft Yolo County Habitat Conservation Plan (2001; 2 letters totaling 35 pp.);
- Merced County General Plan Revision, notice of Negative Declaration (2001: 2 pp.);
- Notice of Preparation of Campus Parkway EIR/EIS (2001: 7 pp.);
- Draft Recovery Plan for the bighorn sheep in the Peninsular Range (*Ovis candensis*) (2000);
- Draft Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*), on behalf of The Wildlife Society—Western Section (2000: 10 pp.);
- Sierra Nevada Forest Plan Amendment Draft Environmental Impact Statement, on behalf of The Wildlife Society—Western Section (2000: 7 pp.);
- State Water Project Supplemental Water Purchase Program, Draft Program EIR (1997);
- Davis General Plan Update EIR (2000);
- Turn of the Century EIR (1999: 10 pp);
- Proposed termination of Critical Habitat Designation under the Endangered Species Act (Fed. Reg. 64(113): 31871-31874) (1999);
- NOA Draft Addendum to the Final Handbook for Habitat Conservation Planning and Incidental Take Permitting Process, termed the HCP 5-Point Policy Plan (Fed. Reg. 64(45): 11485 - 11490) (1999; 2 pp + attachments);
- Covell Center Project EIR and EIR Supplement (1997).

Position Statements I prepared the following position statements for the Western Section of The Wildlife Society, and one for nearly 200 scientists:

- Recommended that the California Department of Fish and Game prioritize the extermination of the introduced southern water snake in northern California. The Wildlife Society--Western Section (2001);
- Recommended that The Wildlife Society—Western Section appoint or recommend members of the independent scientific review panel for the UC Merced environmental review process (2001);
- Opposed the siting of the University of California's 10th campus on a sensitive vernal pool/grassland complex east of Merced. The Wildlife Society--Western Section (2000);
- Opposed the legalization of ferret ownership in California. The Wildlife Society--Western Section (2000);
- Opposed the Proposed "No Surprises," "Safe Harbor," and "Candidate Conservation Agreement" rules, including permit-shield protection provisions (Fed. Reg. Vol. 62, No. 103, pp. 29091-29098 and No. 113, pp. 32189-32194). This statement was signed by 188 scientists and went to the responsible federal agencies, as well as to the U.S. Senate and House of Representatives.

Posters at Professional Meetings

Leyvas, E. and K. S. Smallwood. 2015. Rehabilitating injured animals to offset and rectify wind

project impacts. Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 9-12 March 2015.

Smallwood, K. S., J. Mount, S. Standish, E. Leyvas, D. Bell, E. Walther, B. Karas. 2015. Integrated detection trials to improve the accuracy of fatality rate estimates at wind projects. Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 9-12 March 2015.

Smallwood, K. S. and C. G. Thelander. 2005. Lessons learned from five years of avian mortality research in the Altamont Pass WRA. AWEA conference, Denver, May 2005.

Neher, L., L. Wilder, J. Woo, L. Spiegel, D. Yen-Nakafugi, and K.S. Smallwood. 2005. Bird's eye view on California wind. AWEA conference, Denver, May 2005.

Smallwood, K. S., C. G. Thelander and L. Spiegel. 2003. Toward a predictive model of avian fatalities in the Altamont Pass Wind Resource Area. Windpower 2003 Conference and Convention, Austin, Texas.

Smallwood, K.S. and Eva Butler. 2002. Pocket Gopher Response to Yellow Star-thistle Eradication as part of Grassland Restoration at Decommissioned Mather Air Force Base, Sacramento County, California. White Mountain Research Station Open House, Barcroft Station.

Smallwood, K.S. and Michael L. Morrison. 2002. Fresno kangaroo rat (*Dipodomys nitratoides*) Conservation Research at Resources Management Area 5, Lemoore Naval Air Station. White Mountain Research Station Open House, Barcroft Station.

Smallwood, K.S. and E.L. Fitzhugh. 1989. Differentiating mountain lion and dog tracks. Third Mountain Lion Workshop, Prescott, AZ.

Smith, T. R. and K. S. Smallwood. 2000. Effects of study area size, location, season, and allometry on reported *Sorex* shrew densities. Annual Meeting of the Western Section of The Wildlife Society.

Presentations at Professional Meetings and Seminars

Dog detections of bat and bird fatalities at wind farms in the Altamont Pass Wind Resource Area. East Bay Regional Park District 2019 Stewardship Seminar, Oakland, California, 13 November 2019.

Repowering the Altamont Pass. Altamont Symposium, The Wildlife Society – Western Section, 5 February 2017.

Developing methods to reduce bird mortality in the Altamont Pass Wind Resource Area, 1999-2007. Altamont Symposium, The Wildlife Society – Western Section, 5 February 2017.

Conservation and recovery of burrowing owls in Santa Clara Valley. Santa Clara Valley Habitat Agency, Newark, California, 3 February 2017.

Mitigation of Raptor Fatalities in the Altamont Pass Wind Resource Area. Raptor Research Foundation Meeting, Sacramento, California, 6 November 2015.

From burrows to behavior: Research and management for burrowing owls in a diverse landscape. California Burrowing Owl Consortium meeting, 24 October 2015, San Jose, California.

The Challenges of repowering. Keynote presentation at Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 10 March 2015.

Research Highlights Altamont Pass 2011-2015. Scientific Review Committee, Oakland, California, 8 July 2015.

Siting wind turbines to minimize raptor collisions: Altamont Pass Wind Resource Area. US Fish and Wildlife Service Golden Eagle Working Group, Sacramento, California, 8 January 2015.

Evaluation of nest boxes as a burrowing owl conservation strategy. Sacramento Chapter of the Western Section, The Wildlife Society. Sacramento, California, 26 August 2013.

Predicting collision hazard zones to guide repowering of the Altamont Pass. Conference on wind power and environmental impacts. Stockholm, Sweden, 5-7 February 2013.

Impacts of Wind Turbines on Wildlife. California Council for Wildlife Rehabilitators, Yosemite, California, 12 November 2012.

Impacts of Wind Turbines on Birds and Bats. Madrone Audubon Society, Santa Rosa, California, 20 February 2012.

Comparing Wind Turbine Impacts across North America. California Energy Commission Staff Workshop: Reducing the Impacts of Energy Infrastructure on Wildlife, 20 July 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. California Energy Commission Staff Workshop: Reducing the Impacts of Energy Infrastructure on Wildlife, 20 July 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. Alameda County Scientific Review Committee meeting, 17 February 2011

Comparing Wind Turbine Impacts across North America. Conference on Wind energy and Wildlife impacts, Trondheim, Norway, 3 May 2011.

Update on Wildlife Impacts in the Altamont Pass Wind Resource Area. Raptor Symposium, The Wildlife Society—Western Section, Riverside, California, February 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. Raptor Symposium, The Wildlife Society - Western Section, Riverside, California, February 2011.

Wildlife mortality caused by wind turbine collisions. Ecological Society of America, Pittsburgh, Pennsylvania, 6 August 2010.

Map-based repowering and reorganization of a wind farm to minimize burrowing owl fatalities. California burrowing Owl Consortium Meeting, Livermore, California, 6 February 2010.

Environmental barriers to wind power. Getting Real About Renewables: Economic and Environmental Barriers to Biofuels and Wind Energy. A symposium sponsored by the Environmental & Energy Law & Policy Journal, University of Houston Law Center, Houston, 23 February 2007.

Lessons learned about bird collisions with wind turbines in the Altamont Pass and other US wind farms. Meeting with Japan Ministry of the Environment and Japan Ministry of the Economy, Wild Bird Society of Japan, and other NGOs Tokyo, Japan, 9 November 2006.

Lessons learned about bird collisions with wind turbines in the Altamont Pass and other US wind farms. Symposium on bird collisions with wind turbines. Wild Bird Society of Japan, Tokyo, Japan, 4 November 2006.

Responses of Fresno kangaroo rats to habitat improvements in an adaptive management framework. California Society for Ecological Restoration (SERCAL) 13th Annual Conference, UC Santa Barbara, 27 October 2006.

Fatality associations as the basis for predictive models of fatalities in the Altamont Pass Wind Resource Area. EEI/APLIC/PIER Workshop, 2006 Biologist Task Force and Avian Interaction with Electric Facilities Meeting, Pleasanton, California, 28 April 2006.

Burrowing owl burrows and wind turbine collisions in the Altamont Pass Wind Resource Area. The Wildlife Society - Western Section Annual Meeting, Sacramento, California, February 8, 2006.

Mitigation at wind farms. Workshop: Understanding and resolving bird and bat impacts. American Wind Energy Association and Audubon Society. Los Angeles, CA. January 10 and 11, 2006.

Incorporating data from the California Wildlife Habitat Relationships (CWHR) system into an impact assessment tool for birds near wind farms. Shawn Smallwood, Kevin Hunting, Marcus Yee, Linda Spiegel, Monica Parisi. Workshop: Understanding and resolving bird and bat impacts. American Wind Energy Association and Audubon Society. Los Angeles, CA. January 10 and 11, 2006.

Toward indicating threats to birds by California's new wind farms. California Energy Commission, Sacramento, May 26, 2005.

Avian collisions in the Altamont Pass. California Energy Commission, Sacramento, May 26, 2005.

Ecological solutions for avian collisions with wind turbines in the Altamont Pass Wind Resource Area. EPRI Environmental Sector Council, Monterey, California, February 17, 2005.

Ecological solutions for avian collisions with wind turbines in the Altamont Pass Wind Resource Area. The Wildlife Society—Western Section Annual Meeting, Sacramento, California, January 19, 2005.

Associations between avian fatalities and attributes of electric distribution poles in California. The Wildlife Society - Western Section Annual Meeting, Sacramento, California, January 19, 2005.

Minimizing avian mortality in the Altamont Pass Wind Resources Area. UC Davis Wind Energy Collaborative Forum, Palm Springs, California, December 14, 2004.

Selecting electric distribution poles for priority retrofitting to reduce raptor mortality. Raptor Research Foundation Meeting, Bakersfield, California, November 10, 2004.

Responses of Fresno kangaroo rats to habitat improvements in an adaptive management framework. Annual Meeting of the Society for Ecological Restoration, South Lake Tahoe, California, October 16, 2004.

Lessons learned from five years of avian mortality research at the Altamont Pass Wind Resources Area in California. The Wildlife Society Annual Meeting, Calgary, Canada, September 2004.

The ecology and impacts of power generation at Altamont Pass. Sacramento Petroleum Association, Sacramento, California, August 18, 2004.

Burrowing owl mortality in the Altamont Pass Wind Resource Area. California Burrowing Owl Consortium meeting, Hayward, California, February 7, 2004.

Burrowing owl mortality in the Altamont Pass Wind Resource Area. California Burrowing Owl Symposium, Sacramento, November 2, 2003.

Raptor Mortality at the Altamont Pass Wind Resource Area. National Wind Coordinating Committee, Washington, D.C., November 17, 2003.

Raptor Behavior at the Altamont Pass Wind Resource Area. Annual Meeting of the Raptor Research Foundation, Anchorage, Alaska, September, 2003.

Raptor Mortality at the Altamont Pass Wind Resource Area. Annual Meeting of the Raptor Research Foundation, Anchorage, Alaska, September, 2003.

California mountain lions. Ecological & Environmental Issues Seminar, Department of Biology, California State University, Sacramento, November, 2000.

Intra- and inter-turbine string comparison of fatalities to animal burrow densities at Altamont Pass. National Wind Coordinating Committee, Carmel, California, May, 2000.

Using a Geographic Positioning System (GPS) to map wildlife and habitat. Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

Suggested standards for science applied to conservation issues. Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

The indicators framework applied to ecological restoration in Yolo County, California. Society for Ecological Restoration, September 25, 1999.

Ecological restoration in the context of animal social units and their habitat areas. Society for

Ecological Restoration, September 24, 1999.

Relating Indicators of Ecological Health and Integrity to Assess Risks to Sustainable Agriculture and Native Biota. International Conference on Ecosystem Health, August 16, 1999.

A crosswalk from the Endangered Species Act to the HCP Handbook and real HCPs. Southern California Edison, Co. and California Energy Commission, March 4-5, 1999.

Mountain lion track counts in California: Implications for Management. Ecological & Environmental Issues Seminar, Department of Biological Sciences, California State University, Sacramento, November 4, 1998.

"No Surprises" -- Lack of science in the HCP process. California Native Plant Society Annual Conservation Conference, The Presidio, San Francisco, September 7, 1997.

In Your Interest. A half hour weekly show aired on Channel 10 Television, Sacramento. In this episode, I served on a panel of experts discussing problems with the implementation of the Endangered Species Act. Aired August 31, 1997.

Spatial scaling of pocket gopher (*Geomyidae*) density. Southwestern Association of Naturalists 44th Meeting, Fayetteville, Arkansas, April 10, 1997.

Estimating prairie dog and pocket gopher burrow volume. Southwestern Association of Naturalists 44th Meeting, Fayetteville, Arkansas, April 10, 1997.

Ten years of mountain lion track survey. Fifth Mountain Lion Workshop, San Diego, February 27, 1996.

Study and interpretive design effects on mountain lion density estimates. Fifth Mountain Lion Workshop, San Diego, February 27, 1996.

Small animal control. Session moderator and speaker at the California Farm Conference, Sacramento, California, Feb. 28, 1995.

Small animal control. Ecological Farming Conference, Asylomar, California, Jan. 28, 1995.

Habitat associations of the Swainson's Hawk in the Sacramento Valley's agricultural landscape. 1994 Raptor Research Foundation Meeting, Flagstaff, Arizona.

Alfalfa as wildlife habitat. Seed Industry Conference, Woodland, California, May 4, 1994.

Habitats and vertebrate pests: impacts and management. Managing Farmland to Bring Back Game Birds and Wildlife to the Central Valley. Yolo County Resource Conservation District, U.C. Davis, February 19, 1994.

Management of gophers and alfalfa as wildlife habitat. Orland Alfalfa Production Meeting and Sacramento Valley Alfalfa Production Meeting, February 1 and 2, 1994.

Patterns of wildlife movement in a farming landscape. Wildlife and Fisheries Biology Seminar Series: Recent Advances in Wildlife, Fish, and Conservation Biology, U.C. Davis, Dec. 6, 1993.

Alfalfa as wildlife habitat. California Alfalfa Symposium, Fresno, California, Dec. 9, 1993.

Management of pocket gophers in Sacramento Valley alfalfa. California Alfalfa Symposium, Fresno, California, Dec. 8, 1993.

Association analysis of raptors in a farming landscape. Plenary speaker at Raptor Research Foundation Meeting, Charlotte, North Carolina, Nov. 6, 1993.

Landscape strategies for biological control and IPM. Plenary speaker, International Conference on Integrated Resource Management and Sustainable Agriculture, Beijing, China, Sept. 11, 1993.

Landscape Ecology Study of Pocket Gophers in Alfalfa. Alfalfa Field Day, U.C. Davis, July 1993.

Patterns of wildlife movement in a farming landscape. Spatial Data Analysis Colloquium, U.C. Davis, August 6, 1993.

Sound stewardship of wildlife. Veterinary Medicine Seminar: Ethics of Animal Use, U.C. Davis. May 1993.

Landscape ecology study of pocket gophers in alfalfa. Five County Grower's Meeting, Tracy, California. February 1993.

Turbulence and the community organizers: The role of invading species in ordering a turbulent system, and the factors for invasion success. Ecology Graduate Student Association Colloquium, U.C. Davis. May 1990.

Evaluation of exotic vertebrate pests. Fourteenth Vertebrate Pest Conference, Sacramento, California. March 1990.

Analytical methods for predicting success of mammal introductions to North America. The Western Section of the Wildlife Society, Hilo, Hawaii. February 1988.

A state-wide mountain lion track survey. Sacramento County Dept Parks and Recreation. April 1986.

The mountain lion in California. Davis Chapter of the Audubon Society. October 1985.

Ecology Graduate Student Seminars, U.C. Davis, 1985-1990: Social behavior of the mountain lion; Mountain lion control; Political status of the mountain lion in California.

Other forms of Participation at Professional Meetings

- Scientific Committee, Conference on Wind energy and Wildlife impacts, Berlin, Germany, March 2015.

- Scientific Committee, Conference on Wind energy and Wildlife impacts, Stockholm, Sweden, February 2013.

- Workshop co-presenter at Birds & Wind Energy Specialist Group (BAWESG) Information sharing week, Bird specialist studies for proposed wind energy facilities in South Africa, Endangered Wildlife Trust, Darling, South Africa, 3-7 October 2011.

- Scientific Committee, Conference on Wind energy and Wildlife impacts, Trondheim, Norway, 2-5 May 2011.

- Chair of Animal Damage Management Session, The Wildlife Society, Annual Meeting, Reno, Nevada, September 26, 2001.

- Chair of Technical Session: Human communities and ecosystem health: Comparing perspectives and making connection. Managing for Ecosystem Health, International Congress on Ecosystem Health, Sacramento, CA August 15-20, 1999.

- Student Awards Committee, Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

- Student Mentor, Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

Printed Mass Media

Smallwood, K.S., D. Mooney, and M. McGuinness. 2003. We must stop the UCD biolab now. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 2002. Spring Lake threatens Davis. Op-Ed to the Davis Enterprise.

Smallwood, K.S. Summer, 2001. Mitigation of habitation. The Flatlander, Davis, California.

Entrikan, R.K. and K.S. Smallwood. 2000. Measure O: Flawed law would lock in new taxes. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 2000. Davis delegation lobbies Congress for Wildlife conservation. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 1998. Davis Visions. The Flatlander, Davis, California.

Smallwood, K.S. 1997. Last grab for Yolo's land and water. The Flatlander, Davis, California.

Smallwood, K.S. 1997. The Yolo County HCP. Op-Ed to the Davis Enterprise.

Radio/Television

PBS News Hour,

FOX News, Energy in America: Dead Birds Unintended Consequence of Wind Power Development, August 2011.

KXJZ Capital Public Radio -- Insight (Host Jeffrey Callison). Mountain lion attacks (with guest Professor Richard Coss). 23 April 2009;

KXJZ Capital Public Radio -- Insight (Host Jeffrey Callison). Wind farm Rio Vista Renewable Power. 4 September 2008;

KQED QUEST Episode #111. Bird collisions with wind turbines. 2007;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. December 27, 2001;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. May 3, 2001;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. February 8, 2001;

KDVS Speaking in Tongues (host Ron Glick & Shawn Smallwood), California Energy Crisis: 1 hour. Jan. 25, 2001;

KDVS Speaking in Tongues (host Ron Glick), Headwaters Forest HCP: 1 hour. 1998;

Davis Cable Channel (host Gerald Heffernon), Burrowing owls in Davis: half hour. June, 2000;

Davis Cable Channel (hosted by Davis League of Women Voters), Measure O debate: 1 hour. October, 2000;

KXTV 10, In Your Interest, The Endangered Species Act: half hour. 1997.

Reviews of Journal Papers (Scientific journals for whom I've provided peer review)

Journal	**Journal**
American Naturalist	Journal of Animal Ecology
Journal of Wildlife Management	Western North American Naturalist
Auk	Journal of Raptor Research
Biological Conservation	National Renewable Energy Lab reports
Canadian Journal of Zoology	Oikos
Ecosystem Health	The Prairie Naturalist
Environmental Conservation	Restoration Ecology
Environmental Management	Southwestern Naturalist
Functional Ecology	The Wildlife Society--Western Section Trans.
Journal of Zoology (London)	Proc. Int. Congress on Managing for Ecosystem Health
Journal of Applied Ecology	Transactions in GIS
Ecology	Tropical Ecology

Journal	Journal
Wildlife Society Bulletin	Peer J
Biological Control	The Condor

Committees

- Scientific Review Committee, Alameda County, Altamont Pass Wind Resource Area
- Ph.D. Thesis Committee, Steve Anderson, University of California, Davis
- MS Thesis Committee, Marcus Yee, California State University, Sacramento

Other Professional Activities or Products

Testified in Federal Court in Denver during 2005 over the fate of radio-nuclides in the soil at Rocky Flats Plant after exposure to burrowing animals. My clients won a judgment of $553,000,000. I have also testified in many other cases of litigation under CEQA, NEPA, the Warren-Alquist Act, and other environmental laws. My clients won most of the cases for which I testified.

Testified before Environmental Review Tribunals in Ontario, Canada regarding proposed White Pines, Amherst Island, and Fairview Wind Energy projects.

Testified in Skamania County Hearing in 2009 on the potential impacts of zoning the County for development of wind farms and hazardous waste facilities.

Testified in deposition in 2007 in the case of O'Dell et al. vs. FPL Energy in Houston, Texas.

Testified in Klickitat County Hearing in 2006 on the potential impacts of the Windy Point Wind Farm.

Memberships in Professional Societies

The Wildlife Society
Raptor Research Foundation

Honors and Awards

Fulbright Research Fellowship to Indonesia, 1987
J.G. Boswell Full Academic Scholarship, 1981 college of choice
Certificate of Appreciation, The Wildlife Society—Western Section, 2000, 2001
Northern California Athletic Association Most Valuable Cross Country Runner, 1984
American Legion Award, Corcoran High School, 1981, and John Muir Junior High, 1977
CIF Section Champion, Cross Country in 1978
CIF Section Champion, Track & Field 2 mile run in 1981
National Junior Record, 20 kilometer run, 1982
National Age Group Record, 1500 meter run, 1978

Community Activities

District 64 Little League Umpire, 2003-2007
Dixon Little League Umpire, 2006-07
Davis Little League Chief Umpire and Board member, 2004-2005
Davis Little League Safety Officer, 2004-2005
Davis Little League Certified Umpire, 2002-2004
Davis Little League Scorekeeper, 2002
Davis Visioning Group member
Petitioner for Writ of Mandate under the California Environmental Quality Act against City of Woodland decision to approve the Spring Lake Specific Plan, 2002
Served on campaign committees for City Council candidates

Representative Clients/Funders

Law Offices of Stephan C. Volker	EDF Renewables
Blum Collins, LLP	National Renewable Energy Lab
Eric K. Gillespie Professional Corporation	Altamont Winds LLC
Law Offices of Berger & Montague	Salka Energy
Lozeau | Drury LLP	Comstocks Business (magazine)
Law Offices of Roy Haber	BioResource Consultants
Law Offices of Edward MacDonald	Tierra Data
Law Office of John Gabrielli	Black and Veatch
Law Office of Bill Kopper	Terry Preston, Wildlife Ecology Research Center
Law Office of Donald B. Mooney	EcoStat, Inc.
Law Office of Veneruso & Moncharsh	US Navy
Law Office of Steven Thompson	US Department of Agriculture
Law Office of Brian Gaffney	US Forest Service
California Wildlife Federation	US Fish & Wildlife Service
Defenders of Wildlife	US Department of Justice
Sierra Club	California Energy Commission
National Endangered Species Network	California Office of the Attorney General
Spirit of the Sage Council	California Department of Fish & Wildlife
The Humane Society	California Department of Transportation
Hagens Berman LLP	California Department of Forestry
Environmental Protection Information Center	California Department of Food & Agriculture
Goldberg, Kamin & Garvin, Attorneys at Law	Ventura County Counsel
Californians for Renewable Energy (CARE)	County of Yolo
Seatuck Environmental Association	Tahoe Regional Planning Agency
Friends of the Columbia Gorge, Inc.	Sustainable Agriculture Research & Education Program
Save Our Scenic Area	Sacramento-Yolo Mosquito and Vector Control District
Alliance to Protect Nantucket Sound	East Bay Regional Park District
Friends of the Swainson's Hawk	County of Alameda
Alameda Creek Alliance	Don & LaNelle Silverstien
Center for Biological Diversity	Seventh Day Adventist Church
California Native Plant Society	Escuela de la Raza Unida
Endangered Wildlife Trust	Susan Pelican and Howard Beeman
and BirdLife South Africa	Residents Against Inconsistent Development, Inc.
AquAlliance	Bob Sarvey
Oregon Natural Desert Association	Mike Boyd
Save Our Sound	Hillcroft Neighborhood Fund
G3 Energy and Pattern Energy	Joint Labor Management Committee, Retail Food Industry
Emerald Farms	Lisa Rocca
Pacific Gas & Electric Co.	Kevin Jackson
Southern California Edison Co.	Dawn Stover and Jay Letto
Georgia-Pacific Timber Co.	Nancy Havassy
Northern Territories Inc.	Catherine Portman (for Brenda Cedarblade)
David Magney Environmental Consulting	Ventus Environmental Solutions, Inc.
Wildlife History Foundation	Panorama Environmental, Inc.
NextEra Energy Resources, LLC	Adams Broadwell Professional Corporation
Ogin, Inc.	

Representative special-status species experience

Common name	Species name	Description
Field experience		
California red-legged frog	*Rana aurora draytonii*	Protocol searches; Many detections
Foothill yellow-legged frog	*Rana boylii*	Presence surveys; Many detections
Western spadefoot	*Spea hammondii*	Presence surveys; Few detections
California tiger salamander	*Ambystoma californiense*	Protocol searches; Many detections
Coast range newt	*Taricha torosa torosa*	Searches and multiple detections
Blunt-nosed leopard lizard	*Gambelia sila*	Detected in San Luis Obispo County
California horned lizard	*Phrynosoma coronatum frontale*	Searches; Many detections
Western pond turtle	*Clemmys marmorata*	Searches; Many detections
San Joaquin kit fox	*Vulpes macrotis mutica*	Protocol searches; detections
Sumatran tiger	*Panthera tigris*	Track surveys in Sumatra
Mountain lion	*Puma concolor californicus*	Research and publications
Point Arena mountain beaver	*Aplodontia rufa nigra*	Remote camera operation
Giant kangaroo rat	*Dipodomys ingens*	Detected in Cholame Valley
San Joaquin kangaroo rat	*Dipodomys nitratoides*	Monitoring & habitat restoration
Monterey dusky-footed woodrat	*Neotoma fuscipes luciana*	Non-target captures and mapping of dens
Salt marsh harvest mouse	*Reithrodontomys raviventris*	Habitat assessment, monitoring
Salinas harvest mouse	*Reithrodontomys megalotus distichlus*	Captures; habitat assessment
Bats		Thermal imaging surveys
California clapper rail	*Rallus longirostris*	Surveys and detections
Golden eagle	*Aquila chrysaetos*	Numerical & behavioral surveys
Swainson's hawk	*Buteo swainsoni*	Numerical & behavioral surveys
Northern harrier	*Circus cyaeneus*	Numerical & behavioral surveys
White-tailed kite	*Elanus leucurus*	Numerical & behavioral surveys
Loggerhead shrike	*Lanius ludovicianus*	Large area surveys
Least Bell's vireo	*Vireo bellii pusillus*	Detected in Monterey County
Willow flycatcher	*Empidonax traillii extimus*	Research at Sierra Nevada breeding sites
Burrowing owl	*Athene cunicularia hypugia*	Numerical & behavioral surveys
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	Monitored success of relocation and habitat restoration
Analytical		
Arroyo southwestern toad	*Bufo microscaphus californicus*	Research and report.
Giant garter snake	*Thamnophis gigas*	Research and publication
Northern goshawk	*Accipiter gentilis*	Research and publication
Northern spotted owl	*Strix occidentalis*	Research and reports
Alameda whipsnake	*Masticophis lateralis euryxanthus*	Expert testimony

WRA, the firm that prepared the BRA for the proposed project, reviewed the comment and provided responses. The responses prepared by WRA are included as Appendix C to this document and are adapted in the following Responses to Comments.

Response to Comment 4-1

The original WRA reconnaissance site visit was conducted on July 7, 2019 by Dr. Brian Kearns, who is an experienced wildlife biologist with a specifically avian focus, and Gavin Albertoli, a certified arborist and experienced wetland scientist. This site visit was conducted during early morning hours under fog cover when wildlife species would generally be sufficiently active to be easily observed. The commenter states that he observed 17 vertebrate wildlife species on-site during his site visits on August 20, 2020. WRA acknowledges that a list of observed species was omitted from the original BRA report; however, no special-status species were observed by WRA biologists during their site visit, and observed species were generally typical of this type of urban/open space landscape. It is important to note that while WRA's site visit included observation of species present within the Study Area, WRA's survey was not intended to constitute a dedicated bird/wildlife survey (e.g., a point-count survey). As accurately stated by the commenter, species composition on a given day may vary dependent on various factors, including time of year, time of day, weather, and others.

Additionally, WRA only recorded species that were observed in direct association with the site. WRA does not typically consider species that are observed only in aerial transit well above a given site to be present there. This includes species that may be observed on nearby sites. Aerial foraging within the Study Area's airspace would warrant inclusion in some cases, e.g., for raptors (birds of prey) and bats, if relevant. However, waterbirds flying from one habitat patch to another (e.g., double-crested cormorant) generally do not warrant such inclusion, or at least such observations should be clarified that they only involved birds observed in aerial transit, and regarded as largely incidental. For these reasons, bird species (and other wildlife) are generally assessed based on the likelihood of a site to support critical life functions, rather than the potential for the species to simply fly over.

The commenter states that they observed three special-status species on-site, including FGC Birds of prey and TWL ("Taxa to Watch List"; Shuford and Gardali 2008), and suggests that several more have been detected by locals. Although the details of approaches may vary somewhat, species typically regarded as "special-status" in this context include those that have been formally listed, or are candidates for such listing under the federal Endangered Species Act (ESA) and/or California Endangered Species Act (CESA); CDFW Fully Protected Species (CFP); and, CDFW Species of Special Concern (SSC). Although SSCs generally have no special legal status, they are given special consideration under CEQA. Bat species are also evaluated for conservation status by the Western Bat Working Group (WBWG), a non-governmental entity; bats named as a "High Priority" or "Medium Priority" species for conservation by the WBWG are typically considered special-status.

Most of the observed species that the commenter classifies as "special-status" are common and widespread species that are not typically given special consideration under CEQA or even included on CDFW's highly inclusive Special Animals List.[12] For example, simply being referenced in the California Fish and Game Code (e.g., all birds of prey) does not indicate that a

[12] California Department of Fish and Wildlife, Natural Diversity Database. July 2020. Special Animals List. Periodic publication. 67 pp.

species is special-status. Of the species observed by the commenter, white-tailed kite (CFP) is the only species that should clearly be considered special-status. Note also that WRA's assessment identified white-tailed kite as having the potential to occur on-site, and included as well an assessment of Allen's hummingbird, which the commenter specifically mentions observing on site.

Response to Comment 4-2

The commenter alleges that WRA's species determinations were deficient, as species that were determined to be unlikely to occur by WRA have been documented in the vicinity on eBird (an Internet-based database for observations of wild birds) or by locals making incidental observations of the Study Area. Noted special-status species included in the commenter's list of potentially present species include Swainson's hawk, peregrine falcon, loggerhead shrike, and San Francisco common yellowthroat. WRA would like to acknowledge that San Francisco common yellowthroat may, on occasion, occur within the Study Area during dispersal and other movements. However, the special-status San Francisco Bay Area sub-species is heavily associated with wetland and marsh habitats,[13] neither of which occur within the Study Area. Regardless, nesting bird-related Mitigation Measures in both the BRA and IS/MND would reduce the impacts to this species to a less-than-significant level in the unlikely event that an individual selected the Study Area as a nesting site. WRA generally analyzed species potential based on their likelihood to occupy habitat within the Study Area, or otherwise rely on the Study Area for critical life functions, rather than their simple known presence in the greater vicinity or region. Natural and semi-natural habitats in the vicinity are variable and include many land cover types that are not comparable in quality or extent to the Study Area (i.e., coastal bluffs, dense coniferous forests, perennial wetlands), making searches of local databases inclusive of species that may not utilize the Study Area during their typical life history. As stated in Response to Comment 4-1, birds may be observed flying between suitable habitat patches or during longer-distance migrations in a manner that is largely incidental to the conditions of the Study Area. While eBird and similar databases, as well as local observations, are valuable resources and often are referenced when making species determinations, other factors were considered during the impacts assessment including current site conditions and habitats present and adjacent land use and habitat.

The commenter posits that special-status bat species were not sufficiently addressed in the report, specifically referencing hoary bat. The California Fish and Game Code offers protection to bat species and their roosting habitat, including individual roosts and maternity colonies. For example, hoary bats are strongly associated with forested habitats.[14] While trees are present within the Study Area that could provide temporary roosts (e.g., night roosts) for bat species including hoary bat, these trees are exposed to wind and elements due to their west-facing aspect, making them collectively a relatively poor candidate for bat roosting and thermoregulation. Most of the trees observed within the Study Area are also relatively small, and were not observed by WRA to provide suitably large/deep hollows for the establishment of maternity or hibernacula roosts. The site is also currently subjected to regular direct and indirect anthropogenic disturbance mainly consisting of vehicular and pedestrian traffic from adjacent development, which is a deterrent to roosting for several special-status bat species. Therefore, WRA's assessment

[13] Shuford, W. D. and Gardali, T., eds. 2008. C*alifornia 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.

[14] Western Bat Working Group (WBWG). 2015. Species account for Hoary Bat (Lasiurus cinereus). http://wbwg.org/western-bat-species/ Prepared by: Betsy C. Bolster.

regarding bats is accurate, and the proposed project would not constitute a significant impact to common or special status bat species under CEQA.

Lastly, the commenter suggests that WRA's assessment is deficient with regard to CRLF and SFGS. The commenter further claims that "WRA implies that the known occurrences are the only occurrences for SFGS, but WRA cannot know this to be true". It is true that these species are known to occur in the general vicinity of the Study Area, and also that individuals of either species may exist in local areas that are not documented in databases accessed while generating the BRA. Nonetheless, WRA maintains that implementation of the proposed project would not result in a significant impact under CEQA for either of these species because: 1) neither species is expected to occur within the Study Area, 2) suitable habitat is not present in the immediate vicinity of the Study Area, and 3) impacts within the Study Area will not disrupt behavior or dispersal opportunities for either species in the larger geographic context. More detailed justifications for each species are outlined below.

CRLF requires aquatic habitat for breeding that remains inundated for at least 20 consecutive weeks out of the year.[15] Such habitat is not present within the Study Area, or in the general vicinity of the Study Area. The only aquatic habitat observed by WRA during the site assessment was an ephemeral drainage ditch that terminates in a culvert, which would not provide suitable breeding habitat for this species. Although the commenter suggests that a retention basin is present in the same tract of open space as the Study Area that could provide CRLF breeding habitat, he does not specify the exact location of the basin and WRA was not able to identify such a retention basin based on a post hoc analysis of available historical aerial imagery.[16] The closest documented occurrence of CRLF, and thus the closest documented potential source population, is approximately 0.9 mile to the southeast of the Study Area, and is linked to a large aquatic feature in a largely undisturbed tract of open space.[17] The area between this documented occurrence and the Study Area is largely developed, and contains dispersal barriers such as roads and existing residential housing. Although the commenter is correct in suggesting that CRLF (and SFGS) are capable of crossing roads, roadways are generally considered to be an impedance to wildlife movement, particularly for herpetofauna (reptiles and amphibians). Furthermore, the Study Area itself is not a dispersal bottleneck for CRLF in the context of the adjacent open space and associated habitats. With all impacts considered, in the unlikely event that a CRLF would choose to disperse through the vicinity of the Study Area, ample space is present to allow any CRLF individuals the ability to move through open space to the north. Given these factors, WRA maintains that CRLF is unlikely to occur within the Study Area, and that potential impacts to CRLF due to Project implementation would be less-than-significant under CEQA.

In this locality, SFGS is generally documented along the coast; the nearest known populations existing at Sharp Park around Laguna Salada and within the Mori Point recreation area.[18] These areas are both more than 1.5 miles from the Study Area and are on the west side of SR 1, which should be considered to represent a complete barrier to dispersal from these known source populations. Although this species may use upland habitats during dispersal movements, SFGS generally prefer densely vegetated ponds with nearby open areas that support a suitable prey

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15 U.S. Fish and Wildlife Service (USFWS). 2010. Endangered and Threatened Wildlife and Plants: Revised Designation of Critical Habitat for California Red-legged Frog; Final Rule. Federal Register, Vol. 75, No. 51. 12815-12959.

16 Google. 2020. Google Earth. Available online at: https://www.google.com/earth/. Accessed: September.

17 California Department of Fish and Wildlife. 2020. California Natural Diversity Database. Accessed September 2020.

18 CDFW 2020, suppressed data.

base.[19] Amphibian species, including CRLF, represent an important component of this prey base, although SFGS may forage on small burrowing mammals as well. No aquatic habitats that would support a robust amphibian population are present within the Study Area or immediate vicinity. Few burrows were observed by WRA within the Study Area, suggesting that, even barring the presence of amphibian prey, the Study Area likely provides limited foraging opportunities for SFGS. Due to the lack of aquatic habitat present within the Study Area or within 500 feet of the Study Area, WRA maintains that SFGS are unlikely to occur even during upland movements. Lastly, given the orientation and location of the Study Area, Project activities will not impede the movement of SFGS by creating a bottleneck or dead end. As such, potential impacts to SFGS would be less-than-significant under CEQA.

Response to Comment 4-3

The commenter claims that the proposed project would result in permanent habitat losses, specifically for avian species. The commenter supports these claims using nesting density numbers obtained from studies conducted by Young (1948)[20] and Yahner (1982)[21] in "environments where birds were abundant, similar to the situation at the Project site". While it is true that the Study Area is located adjacent to open space where birds are generally present, it is a misleading extrapolation to use density numbers from the aforementioned studies to determine how many nests will be lost as a result of the proposed project. First, both of the studies cited by Dr. Smallwood were conducted on ecological reserve areas or agricultural research stations, and, despite any potential habitat similarities, are not considered by WRA to be representative of the urban-open space landscape in the Midwestern region of the United States (Wisconsin and Minnesota, respectively). Geographic location is important to consider with regard to biological resources, as it dictates differences in species assemblage, differences in ecosystem productivity, and the difference in the length of the available nesting season in a Mediterranean climate versus a climate where harsh winters would preclude bird nesting until late spring.

Although the proposed project would remove a small amount of potential bird nesting habitat, the overall impact of the proposed project to available habitat and wildlife resources in the vicinity cannot be considered significant under CEQA. When considered in the overall regional context, activities within the project site would not have a significant impact on available nesting habitat for avian species. The proposed project would be located adjacent to habitat that is generally similar to the Study Area, indicating that birds that might otherwise nest within the Study Area would not be forced to make large movements to find suitable habitat after the proposed project is completed. In fact, many of the species observed during WRA's and the commenter's site visits are known to be tolerant of anthropogenic disturbance and development, and would not experience significant displacement effects as a result of the proposed project.[22] Furthermore, Mitigation Measures included in both the BRA and IS/MND should prevent significant impacts to any birds that may be actively nesting within the Study Area.

Response to Comment 4-4

The commenter alleges that the construction proposed on the project site is likely to cause a potentially significant adverse biological impact stemming from the disruption of large-scale migration patterns and local movements, habitat fragmentation, and interruption of critical

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19 USFWS. 2006. San Francisco Garter Snake (Thamnophis sirtalis tetrataenia) 5-Year Review: Summary and Evaluation. Sacramento Fish and Wildlife Office. September.

20 Young, H. 1948. A comparative study of nesting birds in a five-acre park. The Wilson Bulletin 61:36-47.

21 Yahner, R. H. 1982. Avian nest densities and nest-site selection in farmstead shelterbelts. The Wilson Bulletin 94:156-175.

22 Cornell Lab of Ornithology. *Birds of the World*. Available at: https://birdsoftheworld.org/bow/species. Accessed October 2020.

landscape functionality, specifically for dispersing avian species. Based on surrounding land uses and the prevalence of non-developed (natural/semi-natural) land covers, it is not warranted to consider the site critical to wildlife movement in the area. While some species, particularly volant species, can use "stepping stone" dispersal habitats, or closely spaced pockets of habitat between larger core habitat, above all wildlife corridors must link two areas of core habitat and should not direct wildlife to developed areas or areas that are otherwise void of core habitat.[23] The Study Area is adjacent to several consistently trafficked roadways, and a significant amount of residential development. The site is additionally located within 0.3 mile of Milagra Ridge and several other large and small patches of undeveloped land that provide higher quality habitat and may facilitate movement of wildlife species. Furthermore, the development proposed within the project site would not eliminate the utility of adjacent open space as a movement corridor. It should be noted as well that the majority of the bird species observed on-site are tolerant of anthropogenic activities and disturbance; indeed, these species often occur year-round, inclusive of successful breeding, in developed areas (e.g., Anna's hummingbird, black phoebe, California scrub jay, American crow, common raven, house finch, etc.).[24] Therefore, the proposed project is not anticipated to result in any significant impacts to local or regional wildlife movement, let alone result in the loss of critically important movement habitat.

Response to Comment 4-5

The comments regarding bird collisions are noted. WRA has conducted numerous bird-safe design analyses for projects around the Bay Area, and is well-versed in various city and regional guidelines dictating best design practices to minimize bird strikes, including, in part, those mentioned by the commenter. There is increasing awareness that collision with buildings and structures is a noteworthy cause of avian mortality worldwide. As noted by the commenter, a number of design factors are associated with the average rate of bird collisions, including the total extent of exterior glazing (glass; e.g., windows), size of individual contiguous glazing panels, glazing reflectivity, placement and types of landscaping, details of on-site artificial night lighting, and other factors.

WRA reviewed an architectural design sheet for the proposed development within the Study Area ("Vista Mar Development – Monterey Road" by JC Engineering). The design sheet shows similar external elevations for all proposed units, all of which do not exceed three stories in height. Despite the commenter's claim that glazing is extensive on the proposed structures, glazing comprises less than 50 percent of the total building façade. The glazing proposed consists entirely of windows for the residential units, all of which are isolated from each other at regular intervals (versus being grouped/conjoined to form larger contiguous window panels), and each is further divided into smaller areas by mullions. The elevations also feature forms of architectural relief (overhangs, spatially-offset adjacent faces) as well as varied (opaque) materials and colors, all of which would "break up" the exterior visually (i.e., create "visual noise") and increase the likelihood that birds would perceive the building overall as a solid surface. Finally, balcony guardrails in the development appear to be made of metal bars, versus transparent glazing (which poses a relatively high bird collision risk). Overall, by current architectural/design standards as well as according to the relatively strict directives put forth in the City of San Francisco's Bird-Safe Design Guidelines[25] mentioned in the comments, the development (as reflected in the designs referenced above) appears to WRA to provide a relatively minimal risk of bird collisions.

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23 Hilty, J.A., W.Z. Lidicker Jr., and A.M. Merenlender. 2006. Corridor Ecology. Pp. 195-198. Island Press, Washington D.C.

24 Cornell Lab of Ornithology. *Birds of the World*. Available at: https://birdsoftheworld.org/bow/species. Accessed October 2020.

25 San Francisco Planning Department. 2011. Standards for bird-safe buildings. San Francisco Planning Department, City and County of San Francisco, California.

While the foregoing analysis demonstrates that the design of the project would not include features that would increase the likelihood that bird collisions would occur, the number of birds that may collide with the building over time is relatively low (about 1.3-3.1 per year) and, thus, the comment's claim is unsubstantiated.[26] In any event, these impacts are not anticipated to be significant at a regional or even local scale.

Response to Comment 4-6

The commenter suggests that the IS/MND does not adequately address cumulative impacts of the project, specifically stating that "the IS/MND does not even provide a list of existing and foreseeable projects that would contribute cumulative effects on wildlife". However, the IS/MND states that "the proposed project would be consistent with the General Plan land use designation and zoning designation for the project site and, as such, the proposed project was included in the cumulative analysis of the City buildout per the City's General Plan". In addition to land use concerns, it is clearly stated in the IS/MND that mitigation measures related to biological resources would reduce all potential impacts to a less-than-significant level. Given that the project would be consistent with surrounding land uses and has been considered as such in long term planning efforts, WRA agrees with the determination that any cumulative effects of the Project would be less than significant. As such, the contribution of the proposed project to any cumulative impacts is not cumulatively considerable and the IS/MND's discussion of cumulative wildlife impacts is not deficient, as suggested by the commenter. (See also IS/MND Page 85.)

Response to Comment 4-7

The comments suggest that preconstruction surveys for both San Francisco dusky-footed woodrat and nesting birds would not sufficiently detect nests that are potentially present, and also do not sufficiently reduce the impact of the project, or projects in general, to a less-than-significant level. This statement is misleading.

If special-status or common (i.e., those protected only by the MBTA and CFGC) avian species are nesting within the Study Area, pre-construction surveys should detect active nests, and avoidance would consequently be required under Mitigation Measures included in the BRA and IS/MND. There is some limited potential for the site to support nesting by common raptors, i.e., via the trees that are present. However, raptor nests are typically placed high in trees or on other large structures, and are conspicuous to a skilled observer. Vegetation within the site, although dense in some areas (specifically within willow thickets), is not sufficiently dense to prohibit access of a surveying biologist; thus, all areas could be surveyed, and any nests present would likely be detected. It should also be noted that pre-construction nesting bird survey best practices typically include behavioral observation as well as simply looking for nest structures, which greatly increases the likelihood of identifying active nests. A skilled surveyor would thus not be solely dependent on seeing the physical nest to assess a potential impact to an actively nesting bird.

San Francisco dusky-footed woodrat generally produce conspicuous stick nests/structures that are easily identifiable to a qualified biologist. The wording of the mitigation measure included in the BRA for this species allows for ample time for any young that are identified during dismantling of the nests to leave the nest of their own accord. Thus, WRA finds the distinction made by the commenter between "pre-construction" and "pre-project detection" surveys to be moot, as the end result is that any nests that may be present would be protected, and any individuals would be protected from harm, thus avoiding a significant impact under CEQA.

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[26] Scott R. Loss, Tom Will, Sara S. Loss, and Peter P. Marra. *Bird-Building collisions in the United States: Estimates of annual mortality and species vulnerability*. The Condor: Ornithological Applications. Volume 116, 2014, pp. 8-23. Published January 2, 2014.

Response to Comment 4-8

As discussed in Response to Comment 4-1 through 4-7, the information provided by WRA is accurate, and the conclusions reached in the WRA BRA as well as the IS/MND are sound. With regard to the potential loss of bird nests or fledglings, Mitigation Measure IV-3 would ensure that the project site is thoroughly surveyed prior to initiation of construction activities and any bird nests or fledglings identified on-site would be protected. Moreover, when considered in the overall regional context, activities within the project site would not have a significant impact on available nesting habitat for avian species. Considering the movement of wildlife, the project site does not function as a critical wildlife movement area and the site does not connect two or more areas of core habitat for any species. The project would eliminate the potential for undeveloped lands adjacent to the site to be used for wildlife movement; however, as previously noted, the nearby adjacent undeveloped lands do not connect core habitat areas and would not be anticipated to facilitate significant levels of wildlife movement. Although the undeveloped lands adjacent to the project site do not connect any areas of core habitat, the project would not result in further fragmentation of the open lands, as the project site is located at the boundary of the open lands. Consequently, the project would not result in significant impacts related to the movement of wildlife or habitat fragmentation. The number of bird impacts at the site is speculative, but, based on a review of the proposed design of the project, the ultimate number of bird collisions at the site is not anticipated to result in a significant impact when considered on either a local or regional scale. Thus, the commenter has failed to provide substantial evidence to justify their claims that the BRA prepared by WRA is inadequate, and the conclusions presented in the IS/MND remain accurate.

APPENDIX A
GeoForensics, Inc. Geotechnical Commentary (#2)

GEOFORENSICS INC. **Consulting Soil Engineering**

303 Vintage Park Drive, Suite 220, Foster City, CA 94404 Phone: (650) 349-3369 Fax: (650) 571-1878

File: 202049
September 28, 2020

Monterey Road Pacifica, LLC
c/o Javier Chavarria
848 Burns Court
Pacifica, CA 94044

Subject: **Monterey Townhouses**
Monterey Road
Pacifica, California
GEOTECHNICAL COMMENTARY (#2)

Mr. Chavarria:

This letter has been prepared to respond to comments raised in the Steven Bond letter of 9/18/20.

In his letter, Mr. Bond indicates that he has reviewed several documents, but apparently has never been to the site. As a result, his analysis makes factual assumptions about the site that simply do not exist. This may account for some of the erroneous assumptions and extrapolations made in his letter, including:

The "earthen wedge" of material which is to be excavated from the hillside to develop the project is believed by Mr. Bond to consist of loose sediment at the base of a natural valley. Mr. Bond's analysis assumes the site is composed of loosely consolidated sediments (p.1). However, our borings indicated that while there are some loose materials in the drainage swale along the southern side of the property, the majority of the property consists of medium dense to dense surface soils over relatively shallow weathered bedrock. This broader portion of the project site was originally a moderately steep hillside which was cut down to permit the construction of Monterey Road, and is nowhere near the base of a natural valley (actually located approximately halfway up the mountain to Route 35).

As there are two completely distinct areas of the property, to simply transfer ground water levels from the drainage swale across to the middle of a cut slope is inappropriate. Mr. Bond's diagram of a projected water table therefore shows a much steeper grade to the water table than we believe actually exists. This inappropriate steeper grade then causes the proposed buildings to extend deeper below the water table. It would also increase the water flow quantities that Mr. Bond has "estimated".

The Bond report also incorrectly states that our mitigation for any ground water is to place a "seepage collection system between the retaining wall and the walls of the houses". This is not correct. A drainage system will be provided upslope of the retaining wall (as per normal construction practices), and if warranted, the under-slab granular systems can also be fitted with collection pipes to intercept any water seepage which might attempt to bubble up under the buildings.

For Mr. Bond's "significant adverse impacts" on the environment require that the site be developed so as to create a dam against the hillside. There is no intent to create such a feature, as the cost to support hydrostatic pressures are substantially greater than the cost to incorporate adequate drainage facilities and structures within the project design.

As noted in our previous letters and responses to the City Review consultant's letter, our 2002 investigation was only intended to identify any **major geotechnical or geologic constraints for the conceptual review of the proposed development of the site**. The City reviewer did not find any "inadequacies" in our report. The reviewer simply noted that quantitative slope stability calculations were to be performed as part of a design level investigation, to which we concurred in our response letter. Even the City reviewer (Geocon) did not identify ground water as a significant issue for this project.

Finally, it is telling that Mr. Bond concludes that his postulated ground water problems "**will occur even with the mitigations discussed or proposed**" (p.1), despite nearly every paragraph tempered with phrases such as: "likely to result", "probable outcome", or "could produce". Also contrary to business and professional codes, the document does not include his professional geologist stamp, or even his registration number(s).

Should you have any questions please contact the undersigned.

Respectfully Submitted;
GeoForensics, Inc.

Daniel F. Dyckman, PE, GE
Senior Geotechnical Engineer, GE 2145

Email cc: 1 to addressee

APPENDIX B
CalEEMOD Outputs

Vista Mar

Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	8.00	Dwelling Unit	1.20	14,400.00	23

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	269.5	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 Intensity Factor adjusted per PG&E's mandated progress towards RPS

Land Use - Based on proposed Site Plan

Construction Phase - Based on applicant provided construction schedule

Grading - Based on applicant provided information

Woodstoves - Based on applicant provided information

Energy Use -

Mobile Land Use Mitigation - Based on inherent site design and setting

Energy Mitigation - Based on applicant provided information regarding inherent site & project design.

Water Mitigation - Based on applicant provided information regarding project design.

Trips and VMT -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	305.00
tblConstructionPhase	NumDays	200.00	305.00
tblConstructionPhase	NumDays	4.00	44.00
tblConstructionPhase	NumDays	10.00	6.00
tblConstructionPhase	NumDays	2.00	11.00
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberWood	3.44	0.00
tblGrading	AcresOfGrading	16.50	0.70
tblGrading	AcresOfGrading	5.50	0.00
tblGrading	MaterialExported	0.00	3,000.00
tblGrading	MaterialExported	0.00	100.00
tblLandUse	LotAcreage	2.60	1.20
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.2400	1.6356	1.2495	2.3400e-003	0.1368	0.0823	0.2191	0.0728	0.0788	0.1516	0.0000	198.9299	198.9299	0.0377	0.0000	199.8733
2021	0.2336	1.2985	1.2626	2.1800e-003	3.2600e-003	0.0663	0.0696	8.8000e-004	0.0643	0.0652	0.0000	180.7420	180.7420	0.0291	0.0000	181.4699
Maximum	**0.2400**	**1.6356**	**1.2626**	**2.3400e-003**	**0.1368**	**0.0823**	**0.2191**	**0.0728**	**0.0788**	**0.1516**	**0.0000**	**198.9299**	**198.9299**	**0.0377**	**0.0000**	**199.8733**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.2400	1.6356	1.2495	2.3400e-003	0.1368	0.0823	0.2191	0.0728	0.0788	0.1516	0.0000	198.9297	198.9297	0.0377	0.0000	199.8730
2021	0.2336	1.2985	1.2626	2.1800e-003	3.2600e-003	0.0663	0.0696	8.8000e-004	0.0643	0.0652	0.0000	180.7418	180.7418	0.0291	0.0000	181.4697
Maximum	**0.2400**	**1.6356**	**1.2626**	**2.3400e-003**	**0.1368**	**0.0823**	**0.2191**	**0.0728**	**0.0788**	**0.1516**	**0.0000**	**198.9297**	**198.9297**	**0.0377**	**0.0000**	**199.8730**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-1-2020	6-30-2020	0.5927	0.5927
2	7-1-2020	9-30-2020	0.6349	0.6349
3	10-1-2020	12-31-2020	0.6425	0.6425
4	1-1-2021	3-31-2021	0.5782	0.5782
5	4-1-2021	6-30-2021	0.5845	0.5845
6	7-1-2021	9-30-2021	0.3718	0.3718
		Highest	0.6425	0.6425

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0703	1.2100e-003	0.0783	7.0000e-005		3.4100e-003	3.4100e-003		3.4100e-003	3.4100e-003	0.4100	0.3467	0.7567	2.0100e-003	0.0000	0.8084
Energy	1.8300e-003	0.0156	6.6400e-003	1.0000e-004		1.2600e-003	1.2600e-003		1.2600e-003	1.2600e-003	0.0000	25.8749	25.8749	1.1900e-003	5.1000e-004	26.0551
Mobile	0.0188	0.0923	0.2105	7.5000e-004	0.0650	6.8000e-004	0.0657	0.0174	6.4000e-004	0.0181	0.0000	68.9952	68.9952	2.5500e-003	0.0000	69.0589
Waste						0.0000	0.0000		0.0000	0.0000	1.9609	0.0000	1.9609	0.1159	0.0000	4.8580
Water						0.0000	0.0000		0.0000	0.0000	0.1654	0.4854	0.6507	0.0170	4.1000e-004	1.1994
Total	**0.0909**	**0.1091**	**0.2954**	**9.2000e-004**	**0.0650**	**5.3500e-003**	**0.0703**	**0.0174**	**5.3100e-003**	**0.0227**	**2.5362**	**95.7022**	**98.2384**	**0.1387**	**9.2000e-004**	**101.9797**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0703	1.2100e-003	0.0783	7.0000e-005		3.4100e-003	3.4100e-003		3.4100e-003	3.4100e-003	0.4100	0.3467	0.7567	2.0100e-003	0.0000	0.8084
Energy	1.5700e-003	0.0134	5.7000e-003	9.0000e-005		1.0800e-003	1.0800e-003		1.0800e-003	1.0800e-003	0.0000	15.5227	15.5227	3.0000e-004	2.8000e-004	15.6149
Mobile	0.0186	0.0913	0.2074	7.4000e-004	0.0637	6.7000e-004	0.0643	0.0171	6.3000e-004	0.0177	0.0000	67.7182	67.7182	2.5100e-003	0.0000	67.7810
Waste						0.0000	0.0000		0.0000	0.0000	1.9609	0.0000	1.9609	0.1159	0.0000	4.8580
Water						0.0000	0.0000		0.0000	0.0000	0.1158	0.2976	0.4133	0.0119	2.9000e-004	0.7970
Total	**0.0905**	**0.1059**	**0.2914**	**9.0000e-004**	**0.0637**	**5.1600e-003**	**0.0688**	**0.0171**	**5.1200e-003**	**0.0222**	**2.4866**	**83.8852**	**86.3718**	**0.1326**	**5.7000e-004**	**89.8593**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.44**	**2.91**	**1.35**	**2.17**	**1.99**	**3.55**	**2.13**	**2.01**	**3.58**	**2.37**	**1.96**	**12.35**	**12.08**	**4.36**	**38.04**	**11.89**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2020	4/15/2020	5	11	
2	Grading	Grading	4/16/2020	6/16/2020	5	44	
3	Paving	Paving	6/17/2020	6/24/2020	5	6	
4	Building Construction	Building Construction	6/25/2020	8/25/2021	5	305	
5	Architectural Coating	Architectural Coating	7/9/2020	9/8/2021	5	305	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.7

Acres of Paving: 0

Residential Indoor: 29,160; Residential Outdoor: 9,720; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	0.00	13.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	375.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	3.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0290	0.0000	0.0290	0.0159	0.0000	0.0159	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.9600e-003	0.1009	0.0424	9.0000e-005		4.5200e-003	4.5200e-003		4.1500e-003	4.1500e-003	0.0000	8.3196	8.3196	2.6900e-003	0.0000	8.3869
Total	**8.9600e-003**	**0.1009**	**0.0424**	**9.0000e-005**	**0.0290**	**4.5200e-003**	**0.0335**	**0.0159**	**4.1500e-003**	**0.0201**	**0.0000**	**8.3196**	**8.3196**	**2.6900e-003**	**0.0000**	**8.3869**

3.2 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	1.9000e-003	3.8000e-004	1.0000e-005	1.1000e-004	1.0000e-005	1.2000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.4981	0.4981	3.0000e-005	0.0000	0.4988
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.0000e-004	1.0800e-003	0.0000	3.5000e-004	0.0000	3.5000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3046	0.3046	1.0000e-005	0.0000	0.3048
Total	**2.0000e-004**	**2.0000e-003**	**1.4600e-003**	**1.0000e-005**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**1.2000e-004**	**1.0000e-005**	**1.3000e-004**	**0.0000**	**0.8027**	**0.8027**	**4.0000e-005**	**0.0000**	**0.8036**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0290	0.0000	0.0290	0.0159	0.0000	0.0159	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.9600e-003	0.1009	0.0424	9.0000e-005		4.5200e-003	4.5200e-003		4.1500e-003	4.1500e-003	0.0000	8.3196	8.3196	2.6900e-003	0.0000	8.3868
Total	**8.9600e-003**	**0.1009**	**0.0424**	**9.0000e-005**	**0.0290**	**4.5200e-003**	**0.0335**	**0.0159**	**4.1500e-003**	**0.0201**	**0.0000**	**8.3196**	**8.3196**	**2.6900e-003**	**0.0000**	**8.3868**

3.2 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	1.9000e-003	3.8000e-004	1.0000e-005	1.1000e-004	1.0000e-005	1.2000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.4981	0.4981	3.0000e-005	0.0000	0.4988
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.0000e-004	1.0800e-003	0.0000	3.5000e-004	0.0000	3.5000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.3046	0.3046	1.0000e-005	0.0000	0.3048
Total	**2.0000e-004**	**2.0000e-003**	**1.4600e-003**	**1.0000e-005**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**1.2000e-004**	**1.0000e-005**	**1.3000e-004**	**0.0000**	**0.8027**	**0.8027**	**4.0000e-005**	**0.0000**	**0.8036**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0999	0.0000	0.0999	0.0547	0.0000	0.0547	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0297	0.3319	0.1420	3.1000e-004		0.0151	0.0151		0.0139	0.0139	0.0000	27.2571	27.2571	8.8200e-003	0.0000	27.4775
Total	**0.0297**	**0.3319**	**0.1420**	**3.1000e-004**	**0.0999**	**0.0151**	**0.1150**	**0.0547**	**0.0139**	**0.0685**	**0.0000**	**27.2571**	**27.2571**	**8.8200e-003**	**0.0000**	**27.4775**

3.3 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5600e-003	0.0548	0.0110	1.5000e-004	3.1700e-003	1.8000e-004	3.3400e-003	8.7000e-004	1.7000e-004	1.0400e-003	0.0000	14.3695	14.3695	7.4000e-004	0.0000	14.3880
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8000e-004	4.2000e-004	4.3200e-003	1.0000e-005	1.3900e-003	1.0000e-005	1.4000e-003	3.7000e-004	1.0000e-005	3.8000e-004	0.0000	1.2184	1.2184	3.0000e-005	0.0000	1.2192
Total	**2.1400e-003**	**0.0552**	**0.0153**	**1.6000e-004**	**4.5600e-003**	**1.9000e-004**	**4.7400e-003**	**1.2400e-003**	**1.8000e-004**	**1.4200e-003**	**0.0000**	**15.5879**	**15.5879**	**7.7000e-004**	**0.0000**	**15.6071**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0999	0.0000	0.0999	0.0547	0.0000	0.0547	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0297	0.3319	0.1420	3.1000e-004		0.0151	0.0151		0.0139	0.0139	0.0000	27.2571	27.2571	8.8200e-003	0.0000	27.4775
Total	**0.0297**	**0.3319**	**0.1420**	**3.1000e-004**	**0.0999**	**0.0151**	**0.1150**	**0.0547**	**0.0139**	**0.0685**	**0.0000**	**27.2571**	**27.2571**	**8.8200e-003**	**0.0000**	**27.4775**

3.3 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5600e-003	0.0548	0.0110	1.5000e-004	3.1700e-003	1.8000e-004	3.3400e-003	8.7000e-004	1.7000e-004	1.0400e-003	0.0000	14.3695	14.3695	7.4000e-004	0.0000	14.3880
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.8000e-004	4.2000e-004	4.3200e-003	1.0000e-005	1.3900e-003	1.0000e-005	1.4000e-003	3.7000e-004	1.0000e-005	3.8000e-004	0.0000	1.2184	1.2184	3.0000e-005	0.0000	1.2192
Total	**2.1400e-003**	**0.0552**	**0.0153**	**1.6000e-004**	**4.5600e-003**	**1.9000e-004**	**4.7400e-003**	**1.2400e-003**	**1.8000e-004**	**1.4200e-003**	**0.0000**	**15.5879**	**15.5879**	**7.7000e-004**	**0.0000**	**15.6071**

3.4 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5200e-003	0.0254	0.0266	4.0000e-005		1.4100e-003	1.4100e-003		1.3000e-003	1.3000e-003	0.0000	3.5297	3.5297	1.1200e-003	0.0000	3.5577
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5200e-003**	**0.0254**	**0.0266**	**4.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.3000e-003**	**1.3000e-003**	**0.0000**	**3.5297**	**3.5297**	**1.1200e-003**	**0.0000**	**3.5577**

3.4 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	9.0000e-005	9.6000e-004	0.0000	3.1000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2700	0.2700	1.0000e-005	0.0000	0.2702
Total	**1.3000e-004**	**9.0000e-005**	**9.6000e-004**	**0.0000**	**3.1000e-004**	**0.0000**	**3.1000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2700**	**0.2700**	**1.0000e-005**	**0.0000**	**0.2702**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5200e-003	0.0254	0.0266	4.0000e-005		1.4100e-003	1.4100e-003		1.3000e-003	1.3000e-003	0.0000	3.5297	3.5297	1.1200e-003	0.0000	3.5577
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5200e-003**	**0.0254**	**0.0266**	**4.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.3000e-003**	**1.3000e-003**	**0.0000**	**3.5297**	**3.5297**	**1.1200e-003**	**0.0000**	**3.5577**

3.4 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	9.0000e-005	9.6000e-004	0.0000	3.1000e-004	0.0000	3.1000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2700	0.2700	1.0000e-005	0.0000	0.2702
Total	**1.3000e-004**	**9.0000e-005**	**9.6000e-004**	**0.0000**	**3.1000e-004**	**0.0000**	**3.1000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2700**	**0.2700**	**1.0000e-005**	**0.0000**	**0.2702**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1381	1.0056	0.8968	1.5000e-003		0.0541	0.0541		0.0523	0.0523	0.0000	123.4487	123.4487	0.0229	0.0000	124.0216
Total	**0.1381**	**1.0056**	**0.8968**	**1.5000e-003**		**0.0541**	**0.0541**		**0.0523**	**0.0523**	**0.0000**	**123.4487**	**123.4487**	**0.0229**	**0.0000**	**124.0216**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6000e-004	7.8500e-003	1.9700e-003	2.0000e-005	4.5000e-004	4.0000e-005	4.8000e-004	1.3000e-004	4.0000e-005	1.7000e-004	0.0000	1.7804	1.7804	9.0000e-005	0.0000	1.7827
Worker	6.8000e-004	4.8000e-004	5.0100e-003	2.0000e-005	1.6100e-003	1.0000e-005	1.6200e-003	4.3000e-004	1.0000e-005	4.4000e-004	0.0000	1.4123	1.4123	3.0000e-005	0.0000	1.4131
Total	**9.4000e-004**	**8.3300e-003**	**6.9800e-003**	**4.0000e-005**	**2.0600e-003**	**5.0000e-005**	**2.1000e-003**	**5.6000e-004**	**5.0000e-005**	**6.1000e-004**	**0.0000**	**3.1926**	**3.1926**	**1.2000e-004**	**0.0000**	**3.1958**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1381	1.0056	0.8968	1.5000e-003		0.0541	0.0541		0.0523	0.0523	0.0000	123.4485	123.4485	0.0229	0.0000	124.0214
Total	**0.1381**	**1.0056**	**0.8968**	**1.5000e-003**		**0.0541**	**0.0541**		**0.0523**	**0.0523**	**0.0000**	**123.4485**	**123.4485**	**0.0229**	**0.0000**	**124.0214**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6000e-004	7.8500e-003	1.9700e-003	2.0000e-005	4.5000e-004	4.0000e-005	4.8000e-004	1.3000e-004	4.0000e-005	1.7000e-004	0.0000	1.7804	1.7804	9.0000e-005	0.0000	1.7827
Worker	6.8000e-004	4.8000e-004	5.0100e-003	2.0000e-005	1.6100e-003	1.0000e-005	1.6200e-003	4.3000e-004	1.0000e-005	4.4000e-004	0.0000	1.4123	1.4123	3.0000e-005	0.0000	1.4131
Total	**9.4000e-004**	**8.3300e-003**	**6.9800e-003**	**4.0000e-005**	**2.0600e-003**	**5.0000e-005**	**2.1000e-003**	**5.6000e-004**	**5.0000e-005**	**6.1000e-004**	**0.0000**	**3.1926**	**3.1926**	**1.2000e-004**	**0.0000**	**3.1958**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1532	1.1523	1.0900	1.8600e-003		0.0578	0.0578		0.0558	0.0558	0.0000	153.4077	153.4077	0.0274	0.0000	154.0924
Total	**0.1532**	**1.1523**	**1.0900**	**1.8600e-003**		**0.0578**	**0.0578**		**0.0558**	**0.0558**	**0.0000**	**153.4077**	**153.4077**	**0.0274**	**0.0000**	**154.0924**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7000e-004	8.8300e-003	2.2000e-003	2.0000e-005	5.5000e-004	2.0000e-005	5.7000e-004	1.6000e-004	2.0000e-005	1.8000e-004	0.0000	2.1915	2.1915	1.1000e-004	0.0000	2.1942
Worker	7.8000e-004	5.4000e-004	5.6900e-003	2.0000e-005	2.0000e-003	1.0000e-005	2.0200e-003	5.3000e-004	1.0000e-005	5.4000e-004	0.0000	1.6934	1.6934	4.0000e-005	0.0000	1.6943
Total	**1.0500e-003**	**9.3700e-003**	**7.8900e-003**	**4.0000e-005**	**2.5500e-003**	**3.0000e-005**	**2.5900e-003**	**6.9000e-004**	**3.0000e-005**	**7.2000e-004**	**0.0000**	**3.8848**	**3.8848**	**1.5000e-004**	**0.0000**	**3.8885**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1532	1.1523	1.0900	1.8600e-003		0.0578	0.0578		0.0558	0.0558	0.0000	153.4076	153.4076	0.0274	0.0000	154.0922
Total	**0.1532**	**1.1523**	**1.0900**	**1.8600e-003**		**0.0578**	**0.0578**		**0.0558**	**0.0558**	**0.0000**	**153.4076**	**153.4076**	**0.0274**	**0.0000**	**154.0922**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7000e-004	8.8300e-003	2.2000e-003	2.0000e-005	5.5000e-004	2.0000e-005	5.7000e-004	1.6000e-004	2.0000e-005	1.8000e-004	0.0000	2.1915	2.1915	1.1000e-004	0.0000	2.1942
Worker	7.8000e-004	5.4000e-004	5.6900e-003	2.0000e-005	2.0000e-003	1.0000e-005	2.0200e-003	5.3000e-004	1.0000e-005	5.4000e-004	0.0000	1.6934	1.6934	4.0000e-005	0.0000	1.6943
Total	**1.0500e-003**	**9.3700e-003**	**7.8900e-003**	**4.0000e-005**	**2.5500e-003**	**3.0000e-005**	**2.5900e-003**	**6.9000e-004**	**3.0000e-005**	**7.2000e-004**	**0.0000**	**3.8848**	**3.8848**	**1.5000e-004**	**0.0000**	**3.8885**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0419					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0153	0.1061	0.1154	1.9000e-004		6.9900e-003	6.9900e-003		6.9900e-003	6.9900e-003	0.0000	16.0855	16.0855	1.2500e-003	0.0000	16.1166
Total	**0.0571**	**0.1061**	**0.1154**	**1.9000e-004**		**6.9900e-003**	**6.9900e-003**		**6.9900e-003**	**6.9900e-003**	**0.0000**	**16.0855**	**16.0855**	**1.2500e-003**	**0.0000**	**16.1166**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.5000e-004	1.5500e-003	0.0000	5.0000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.4000e-004	0.0000	0.4361	0.4361	1.0000e-005	0.0000	0.4364
Total	**2.1000e-004**	**1.5000e-004**	**1.5500e-003**	**0.0000**	**5.0000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4361**	**0.4361**	**1.0000e-005**	**0.0000**	**0.4364**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0419					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0153	0.1061	0.1154	1.9000e-004		6.9900e-003	6.9900e-003		6.9900e-003	6.9900e-003	0.0000	16.0855	16.0855	1.2500e-003	0.0000	16.1166
Total	**0.0571**	**0.1061**	**0.1154**	**1.9000e-004**		**6.9900e-003**	**6.9900e-003**		**6.9900e-003**	**6.9900e-003**	**0.0000**	**16.0855**	**16.0855**	**1.2500e-003**	**0.0000**	**16.1166**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.5000e-004	1.5500e-003	0.0000	5.0000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.4000e-004	0.0000	0.4361	0.4361	1.0000e-005	0.0000	0.4364
Total	**2.1000e-004**	**1.5000e-004**	**1.5500e-003**	**0.0000**	**5.0000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4361**	**0.4361**	**1.0000e-005**	**0.0000**	**0.4364**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0595					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0196	0.1367	0.1627	2.7000e-004		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003	0.0000	22.8516	22.8516	1.5700e-003	0.0000	22.8908
Total	**0.0791**	**0.1367**	**0.1627**	**2.7000e-004**		**8.4200e-003**	**8.4200e-003**		**8.4200e-003**	**8.4200e-003**	**0.0000**	**22.8516**	**22.8516**	**1.5700e-003**	**0.0000**	**22.8908**

3.6 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	1.9000e-004	2.0100e-003	1.0000e-005	7.1000e-004	0.0000	7.1000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.5979	0.5979	1.0000e-005	0.0000	0.5982
Total	**2.7000e-004**	**1.9000e-004**	**2.0100e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5979**	**0.5979**	**1.0000e-005**	**0.0000**	**0.5982**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0595					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0196	0.1367	0.1627	2.7000e-004		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003	0.0000	22.8516	22.8516	1.5700e-003	0.0000	22.8908
Total	**0.0791**	**0.1367**	**0.1627**	**2.7000e-004**		**8.4200e-003**	**8.4200e-003**		**8.4200e-003**	**8.4200e-003**	**0.0000**	**22.8516**	**22.8516**	**1.5700e-003**	**0.0000**	**22.8908**

3.6 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-004	1.9000e-004	2.0100e-003	1.0000e-005	7.1000e-004	0.0000	7.1000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.5979	0.5979	1.0000e-005	0.0000	0.5982
Total	**2.7000e-004**	**1.9000e-004**	**2.0100e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5979**	**0.5979**	**1.0000e-005**	**0.0000**	**0.5982**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0186	0.0913	0.2074	7.4000e-004	0.0637	6.7000e-004	0.0643	0.0171	6.3000e-004	0.0177	0.0000	67.7182	67.7182	2.5100e-003	0.0000	67.7810
Unmitigated	0.0188	0.0923	0.2105	7.5000e-004	0.0650	6.8000e-004	0.0657	0.0174	6.4000e-004	0.0181	0.0000	68.9952	68.9952	2.5500e-003	0.0000	69.0589

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	76.16	79.28	68.96	174,554	171,062
Total	76.16	79.28	68.96	174,554	171,062

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Kilowatt Hours of Renewable Electricity Generated

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	-0.0029	-0.0029	0.0000	0.0000	-0.0030
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	7.8064	7.8064	8.4000e-004	1.7000e-004	7.8792
NaturalGas Mitigated	1.5700e-003	0.0134	5.7000e-003	9.0000e-005		1.0800e-003	1.0800e-003		1.0800e-003	1.0800e-003	0.0000	15.5256	15.5256	3.0000e-004	2.8000e-004	15.6179
NaturalGas Unmitigated	1.8300e-003	0.0156	6.6400e-003	1.0000e-004		1.2600e-003	1.2600e-003		1.2600e-003	1.2600e-003	0.0000	18.0685	18.0685	3.5000e-004	3.3000e-004	18.1758

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	338590	1.8300e-003	0.0156	6.6400e-003	1.0000e-004		1.2600e-003	1.2600e-003		1.2600e-003	1.2600e-003	0.0000	18.0685	18.0685	3.5000e-004	3.3000e-004	18.1758
Total		**1.8300e-003**	**0.0156**	**6.6400e-003**	**1.0000e-004**		**1.2600e-003**	**1.2600e-003**		**1.2600e-003**	**1.2600e-003**	**0.0000**	**18.0685**	**18.0685**	**3.5000e-004**	**3.3000e-004**	**18.1758**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	290940	1.5700e-003	0.0134	5.7000e-003	9.0000e-005		1.0800e-003	1.0800e-003		1.0800e-003	1.0800e-003	0.0000	15.5256	15.5256	3.0000e-004	2.8000e-004	15.6179
Total		**1.5700e-003**	**0.0134**	**5.7000e-003**	**9.0000e-005**		**1.0800e-003**	**1.0800e-003**		**1.0800e-003**	**1.0800e-003**	**0.0000**	**15.5256**	**15.5256**	**3.0000e-004**	**2.8000e-004**	**15.6179**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	63859.9	7.8064	8.4000e-004	1.7000e-004	7.8792
Total		**7.8064**	**8.4000e-004**	**1.7000e-004**	**7.8792**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	-24	-0.0029	0.0000	0.0000	-0.0030
Total		**-0.0029**	**0.0000**	**0.0000**	**-0.0030**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0703	1.2100e-003	0.0783	7.0000e-005		3.4100e-003	3.4100e-003		3.4100e-003	3.4100e-003	0.4100	0.3467	0.7567	2.0100e-003	0.0000	0.8084
Unmitigated	0.0703	1.2100e-003	0.0783	7.0000e-005		3.4100e-003	3.4100e-003		3.4100e-003	3.4100e-003	0.4100	0.3467	0.7567	2.0100e-003	0.0000	0.8084

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0101					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0562					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.0900e-003	5.2000e-004	0.0189	6.0000e-005		3.0800e-003	3.0800e-003		3.0800e-003	3.0800e-003	0.4100	0.2497	0.6597	1.9200e-003	0.0000	0.7091
Landscaping	1.8000e-003	6.9000e-004	0.0595	0.0000		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	0.0970	0.0970	9.0000e-005	0.0000	0.0994
Total	**0.0703**	**1.2100e-003**	**0.0783**	**6.0000e-005**		**3.4100e-003**	**3.4100e-003**		**3.4100e-003**	**3.4100e-003**	**0.4100**	**0.3467**	**0.7567**	**2.0100e-003**	**0.0000**	**0.8084**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0101					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0562					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.0900e-003	5.2000e-004	0.0189	6.0000e-005		3.0800e-003	3.0800e-003		3.0800e-003	3.0800e-003	0.4100	0.2497	0.6597	1.9200e-003	0.0000	0.7091
Landscaping	1.8000e-003	6.9000e-004	0.0595	0.0000		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	0.0970	0.0970	9.0000e-005	0.0000	0.0994
Total	**0.0703**	**1.2100e-003**	**0.0783**	**6.0000e-005**		**3.4100e-003**	**3.4100e-003**		**3.4100e-003**	**3.4100e-003**	**0.4100**	**0.3467**	**0.7567**	**2.0100e-003**	**0.0000**	**0.8084**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.4133	0.0119	2.9000e-004	0.7970
Unmitigated	0.6507	0.0170	4.1000e-004	1.1994

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0.521232 / 0.328603	0.6507	0.0170	4.1000e-004	1.1994
Total		**0.6507**	**0.0170**	**4.1000e-004**	**1.1994**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0.364863 / 0.131441	0.4133	0.0119	2.9000e-004	0.7970
Total		**0.4133**	**0.0119**	**2.9000e-004**	**0.7970**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.9609	0.1159	0.0000	4.8580
Unmitigated	1.9609	0.1159	0.0000	4.8580

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	9.66	1.9609	0.1159	0.0000	4.8580
Total		**1.9609**	**0.1159**	**0.0000**	**4.8580**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	9.66	1.9609	0.1159	0.0000	4.8580
Total		**1.9609**	**0.1159**	**0.0000**	**4.8580**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Vista Mar

Bay Area AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	8.00	Dwelling Unit	1.20	14,400.00	23

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	269.5	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 Intensity Factor adjusted per PG&E's mandated progress towards RPS

Land Use - Based on proposed Site Plan

Construction Phase - Based on applicant provided construction schedule

Grading - Based on applicant provided information

Woodstoves - Based on applicant provided information

Energy Use -

Mobile Land Use Mitigation - Based on inherent site design and setting

Energy Mitigation - Based on applicant provided information regarding inherent site & project design.

Water Mitigation - Based on applicant provided information regarding project design.

Trips and VMT -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	305.00
tblConstructionPhase	NumDays	200.00	305.00
tblConstructionPhase	NumDays	4.00	44.00
tblConstructionPhase	NumDays	10.00	6.00
tblConstructionPhase	NumDays	2.00	11.00
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberWood	3.44	0.00
tblGrading	AcresOfGrading	16.50	0.70
tblGrading	AcresOfGrading	5.50	0.00
tblGrading	MaterialExported	0.00	3,000.00
tblGrading	MaterialExported	0.00	100.00
tblLandUse	LotAcreage	2.60	1.20
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	2.9551	18.7018	15.1540	0.0256	5.3567	0.9077	6.1792	2.9197	0.8805	3.6764	0.0000	2,344.6094	2,344.6094	0.5459	0.0000	2,354.4971
2021	2.7121	15.2738	14.8396	0.0256	0.0396	0.7789	0.8185	0.0107	0.7553	0.7660	0.0000	2,343.2423	2,343.2423	0.3787	0.0000	2,352.7085
Maximum	**2.9551**	**18.7018**	**15.1540**	**0.0256**	**5.3567**	**0.9077**	**6.1792**	**2.9197**	**0.8805**	**3.6764**	**0.0000**	**2,344.6094**	**2,344.6094**	**0.5459**	**0.0000**	**2,354.4971**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	2.9551	18.7018	15.1540	0.0256	5.3567	0.9077	6.1792	2.9197	0.8805	3.6764	0.0000	2,344.6094	2,344.6094	0.5459	0.0000	2,354.4971
2021	2.7121	15.2738	14.8396	0.0256	0.0396	0.7789	0.8185	0.0107	0.7553	0.7660	0.0000	2,343.2423	2,343.2423	0.3787	0.0000	2,352.7085
Maximum	**2.9551**	**18.7018**	**15.1540**	**0.0256**	**5.3567**	**0.9077**	**6.1792**	**2.9197**	**0.8805**	**3.6764**	**0.0000**	**2,344.6094**	**2,344.6094**	**0.5459**	**0.0000**	**2,354.4971**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.5845	0.0754	2.4596	6.1000e-003		0.2976	0.2976		0.2976	0.2976	42.9170	50.6002	93.5172	0.2027	9.1000e-004	98.8552
Energy	0.0100	0.0855	0.0364	5.5000e-004		6.9100e-003	6.9100e-003		6.9100e-003	6.9100e-003		109.1346	109.1346	2.0900e-003	2.0000e-003	109.7831
Mobile	0.1239	0.5161	1.2605	4.5800e-003	0.3890	3.9200e-003	0.3929	0.1041	3.6700e-003	0.1078		463.8067	463.8067	0.0163		464.2133
Total	**0.7184**	**0.6770**	**3.7564**	**0.0112**	**0.3890**	**0.3084**	**0.6974**	**0.1041**	**0.3081**	**0.4122**	**42.9170**	**623.5415**	**666.4585**	**0.2211**	**2.9100e-003**	**672.8516**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.5845	0.0754	2.4596	6.1000e-003		0.2976	0.2976		0.2976	0.2976	42.9170	50.6002	93.5172	0.2027	9.1000e-004	98.8552
Energy	8.6000e-003	0.0735	0.0313	4.7000e-004		5.9400e-003	5.9400e-003		5.9400e-003	5.9400e-003		93.7759	93.7759	1.8000e-003	1.7200e-003	94.3331
Mobile	0.1231	0.5108	1.2406	4.5000e-003	0.3812	3.8500e-003	0.3851	0.1020	3.6100e-003	0.1056		455.2102	455.2102	0.0160		455.6109
Total	**0.7162**	**0.6597**	**3.7314**	**0.0111**	**0.3812**	**0.3073**	**0.6886**	**0.1020**	**0.3071**	**0.4091**	**42.9170**	**599.5863**	**642.5032**	**0.2206**	**2.6300e-003**	**648.7992**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.30	2.56	0.67	1.42	2.00	0.34	1.26	2.00	0.33	0.76	0.00	3.84	3.59	0.24	9.62	3.57

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2020	4/15/2020	5	11	
2	Grading	Grading	4/16/2020	6/16/2020	5	44	
3	Paving	Paving	6/17/2020	6/24/2020	5	6	
4	Building Construction	Building Construction	6/25/2020	8/25/2021	5	305	
5	Architectural Coating	Architectural Coating	7/9/2020	9/8/2021	5	305	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.7

Acres of Paving: 0

Residential Indoor: 29,160; Residential Outdoor: 9,720; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	0.00	13.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	375.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	3.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2704	0.0000	5.2704	2.8966	0.0000	2.8966			0.0000			0.0000
Off-Road	1.6299	18.3464	7.7093	0.0172		0.8210	0.8210		0.7553	0.7553		1,667.4119	1,667.4119	0.5393		1,680.8937
Total	**1.6299**	**18.3464**	**7.7093**	**0.0172**	**5.2704**	**0.8210**	**6.0913**	**2.8966**	**0.7553**	**3.6519**		**1,667.4119**	**1,667.4119**	**0.5393**		**1,680.8937**

3.2 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.7500e-003	0.3385	0.0673	9.4000e-004	0.0207	1.1100e-003	0.0218	5.6600e-003	1.0600e-003	6.7200e-003		100.5472	100.5472	5.0300e-003		100.6729
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0278	0.0168	0.2146	6.6000e-004	0.0657	4.3000e-004	0.0661	0.0174	3.9000e-004	0.0178		65.6621	65.6621	1.5800e-003		65.7017
Total	**0.0376**	**0.3554**	**0.2819**	**1.6000e-003**	**0.0864**	**1.5400e-003**	**0.0879**	**0.0231**	**1.4500e-003**	**0.0245**		**166.2093**	**166.2093**	**6.6100e-003**		**166.3746**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2704	0.0000	5.2704	2.8966	0.0000	2.8966			0.0000			0.0000
Off-Road	1.6299	18.3464	7.7093	0.0172		0.8210	0.8210		0.7553	0.7553	0.0000	1,667.4119	1,667.4119	0.5393		1,680.8937
Total	**1.6299**	**18.3464**	**7.7093**	**0.0172**	**5.2704**	**0.8210**	**6.0913**	**2.8966**	**0.7553**	**3.6519**	**0.0000**	**1,667.4119**	**1,667.4119**	**0.5393**		**1,680.8937**

3.2 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.7500e-003	0.3385	0.0673	9.4000e-004	0.0207	1.1100e-003	0.0218	5.6600e-003	1.0600e-003	6.7200e-003		100.5472	100.5472	5.0300e-003		100.6729
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0278	0.0168	0.2146	6.6000e-004	0.0657	4.3000e-004	0.0661	0.0174	3.9000e-004	0.0178		65.6621	65.6621	1.5800e-003		65.7017
Total	**0.0376**	**0.3554**	**0.2819**	**1.6000e-003**	**0.0864**	**1.5400e-003**	**0.0879**	**0.0231**	**1.4500e-003**	**0.0245**		**166.2093**	**166.2093**	**6.6100e-003**		**166.3746**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.5412	0.0000	4.5412	2.4857	0.0000	2.4857			0.0000			0.0000
Off-Road	1.3498	15.0854	6.4543	0.0141		0.6844	0.6844		0.6296	0.6296		1,365.7183	1,365.7183	0.4417		1,376.7609
Total	**1.3498**	**15.0854**	**6.4543**	**0.0141**	**4.5412**	**0.6844**	**5.2255**	**2.4857**	**0.6296**	**3.1153**		**1,365.7183**	**1,365.7183**	**0.4417**		**1,376.7609**

3.3 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0703	2.4413	0.4852	6.7800e-003	0.1489	7.9800e-003	0.1569	0.0408	7.6300e-003	0.0484		725.0996	725.0996	0.0363		726.0065
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0278	0.0168	0.2146	6.6000e-004	0.0657	4.3000e-004	0.0661	0.0174	3.9000e-004	0.0178		65.6621	65.6621	1.5800e-003		65.7017
Total	**0.0981**	**2.4581**	**0.6998**	**7.4400e-003**	**0.2146**	**8.4100e-003**	**0.2230**	**0.0582**	**8.0200e-003**	**0.0663**		**790.7617**	**790.7617**	**0.0379**		**791.7081**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.5412	0.0000	4.5412	2.4857	0.0000	2.4857			0.0000			0.0000
Off-Road	1.3498	15.0854	6.4543	0.0141		0.6844	0.6844		0.6296	0.6296	0.0000	1,365.7183	1,365.7183	0.4417		1,376.7609
Total	**1.3498**	**15.0854**	**6.4543**	**0.0141**	**4.5412**	**0.6844**	**5.2255**	**2.4857**	**0.6296**	**3.1153**	**0.0000**	**1,365.7183**	**1,365.7183**	**0.4417**		**1,376.7609**

3.3 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0703	2.4413	0.4852	6.7800e-003	0.1489	7.9800e-003	0.1569	0.0408	7.6300e-003	0.0484		725.0996	725.0996	0.0363		726.0065
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0278	0.0168	0.2146	6.6000e-004	0.0657	4.3000e-004	0.0661	0.0174	3.9000e-004	0.0178		65.6621	65.6621	1.5800e-003		65.7017
Total	**0.0981**	**2.4581**	**0.6998**	**7.4400e-003**	**0.2146**	**8.4100e-003**	**0.2230**	**0.0582**	**8.0200e-003**	**0.0663**		**790.7617**	**790.7617**	**0.0379**		**791.7081**

3.4 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8402	8.4514	8.8758	0.0135		0.4695	0.4695		0.4328	0.4328		1,296.9461	1,296.9461	0.4111		1,307.2246
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8402**	**8.4514**	**8.8758**	**0.0135**		**0.4695**	**0.4695**		**0.4328**	**0.4328**		**1,296.9461**	**1,296.9461**	**0.4111**		**1,307.2246**

3.4 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0452	0.0274	0.3488	1.0700e-003	0.1068	6.9000e-004	0.1075	0.0283	6.4000e-004	0.0290		106.7010	106.7010	2.5700e-003		106.7652
Total	**0.0452**	**0.0274**	**0.3488**	**1.0700e-003**	**0.1068**	**6.9000e-004**	**0.1075**	**0.0283**	**6.4000e-004**	**0.0290**		**106.7010**	**106.7010**	**2.5700e-003**		**106.7652**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8402	8.4514	8.8758	0.0135		0.4695	0.4695		0.4328	0.4328	0.0000	1,296.9461	1,296.9461	0.4111		1,307.2246
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8402**	**8.4514**	**8.8758**	**0.0135**		**0.4695**	**0.4695**		**0.4328**	**0.4328**	**0.0000**	**1,296.9461**	**1,296.9461**	**0.4111**		**1,307.2246**

3.4 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0452	0.0274	0.3488	1.0700e-003	0.1068	6.9000e-004	0.1075	0.0283	6.4000e-004	0.0290		106.7010	106.7010	2.5700e-003		106.7652
Total	**0.0452**	**0.0274**	**0.3488**	**1.0700e-003**	**0.1068**	**6.9000e-004**	**0.1075**	**0.0283**	**6.4000e-004**	**0.0290**		**106.7010**	**106.7010**	**2.5700e-003**		**106.7652**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0305	14.7882	13.1881	0.0220		0.7960	0.7960		0.7688	0.7688		2,001.1595	2,001.1595	0.3715		2,010.4467
Total	**2.0305**	**14.7882**	**13.1881**	**0.0220**		**0.7960**	**0.7960**		**0.7688**	**0.7688**		**2,001.1595**	**2,001.1595**	**0.3715**		**2,010.4467**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.7900e-003	0.1140	0.0272	2.8000e-004	6.7700e-003	5.6000e-004	7.3300e-003	1.9500e-003	5.3000e-004	2.4800e-003		29.1708	29.1708	1.4400e-003		29.2067
Worker	0.0104	6.3100e-003	0.0805	2.5000e-004	0.0246	1.6000e-004	0.0248	6.5400e-003	1.5000e-004	6.6800e-003		24.6233	24.6233	5.9000e-004		24.6381
Total	**0.0142**	**0.1203**	**0.1077**	**5.3000e-004**	**0.0314**	**7.2000e-004**	**0.0321**	**8.4900e-003**	**6.8000e-004**	**9.1600e-003**		**53.7941**	**53.7941**	**2.0300e-003**		**53.8449**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0305	14.7882	13.1881	0.0220		0.7960	0.7960		0.7688	0.7688	0.0000	2,001.1595	2,001.1595	0.3715		2,010.4467
Total	**2.0305**	**14.7882**	**13.1881**	**0.0220**		**0.7960**	**0.7960**		**0.7688**	**0.7688**	**0.0000**	**2,001.1595**	**2,001.1595**	**0.3715**		**2,010.4467**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.7900e-003	0.1140	0.0272	2.8000e-004	6.7700e-003	5.6000e-004	7.3300e-003	1.9500e-003	5.3000e-004	2.4800e-003		29.1708	29.1708	1.4400e-003		29.2067
Worker	0.0104	6.3100e-003	0.0805	2.5000e-004	0.0246	1.6000e-004	0.0248	6.5400e-003	1.5000e-004	6.6800e-003		24.6233	24.6233	5.9000e-004		24.6381
Total	**0.0142**	**0.1203**	**0.1077**	**5.3000e-004**	**0.0314**	**7.2000e-004**	**0.0321**	**8.4900e-003**	**6.8000e-004**	**9.1600e-003**		**53.7941**	**53.7941**	**2.0300e-003**		**53.8449**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8125	13.6361	12.8994	0.0221		0.6843	0.6843		0.6608	0.6608		2,001.2200	2,001.2200	0.3573		2,010.1517
Total	**1.8125**	**13.6361**	**12.8994**	**0.0221**		**0.6843**	**0.6843**		**0.6608**	**0.6608**		**2,001.2200**	**2,001.2200**	**0.3573**		**2,010.1517**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.1000e-003	0.1033	0.0244	2.7000e-004	6.7700e-003	2.2000e-004	6.9900e-003	1.9500e-003	2.1000e-004	2.1600e-003		28.8959	28.8959	1.3600e-003		28.9298
Worker	9.6500e-003	5.6400e-003	0.0737	2.4000e-004	0.0246	1.6000e-004	0.0248	6.5400e-003	1.4000e-004	6.6800e-003		23.7588	23.7588	5.3000e-004		23.7721
Total	**0.0128**	**0.1090**	**0.0981**	**5.1000e-004**	**0.0314**	**3.8000e-004**	**0.0318**	**8.4900e-003**	**3.5000e-004**	**8.8400e-003**		**52.6546**	**52.6546**	**1.8900e-003**		**52.7018**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8125	13.6361	12.8994	0.0221		0.6843	0.6843		0.6608	0.6608	0.0000	2,001.2200	2,001.2200	0.3573		2,010.1517
Total	**1.8125**	**13.6361**	**12.8994**	**0.0221**		**0.6843**	**0.6843**		**0.6608**	**0.6608**	**0.0000**	**2,001.2200**	**2,001.2200**	**0.3573**		**2,010.1517**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.1000e-003	0.1033	0.0244	2.7000e-004	6.7700e-003	2.2000e-004	6.9900e-003	1.9500e-003	2.1000e-004	2.1600e-003		28.8959	28.8959	1.3600e-003		28.9298
Worker	9.6500e-003	5.6400e-003	0.0737	2.4000e-004	0.0246	1.6000e-004	0.0248	6.5400e-003	1.4000e-004	6.6800e-003		23.7588	23.7588	5.3000e-004		23.7721
Total	**0.0128**	**0.1090**	**0.0981**	**5.1000e-004**	**0.0314**	**3.8000e-004**	**0.0318**	**8.4900e-003**	**3.5000e-004**	**8.8400e-003**		**52.6546**	**52.6546**	**1.8900e-003**		**52.7018**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.6647					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**0.9069**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.4800e-003	2.1000e-003	0.0268	8.0000e-005	8.2100e-003	5.0000e-005	8.2700e-003	2.1800e-003	5.0000e-005	2.2300e-003		8.2078	8.2078	2.0000e-004		8.2127
Total	**3.4800e-003**	**2.1000e-003**	**0.0268**	**8.0000e-005**	**8.2100e-003**	**5.0000e-005**	**8.2700e-003**	**2.1800e-003**	**5.0000e-005**	**2.2300e-003**		**8.2078**	**8.2078**	**2.0000e-004**		**8.2127**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.6647					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**0.9069**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.4800e-003	2.1000e-003	0.0268	8.0000e-005	8.2100e-003	5.0000e-005	8.2700e-003	2.1800e-003	5.0000e-005	2.2300e-003		8.2078	8.2078	2.0000e-004		8.2127
Total	**3.4800e-003**	**2.1000e-003**	**0.0268**	**8.0000e-005**	**8.2100e-003**	**5.0000e-005**	**8.2700e-003**	**2.1800e-003**	**5.0000e-005**	**2.2300e-003**		**8.2078**	**8.2078**	**2.0000e-004**		**8.2127**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.6647					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**0.8836**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.6 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.2200e-003	1.8800e-003	0.0246	8.0000e-005	8.2100e-003	5.0000e-005	8.2700e-003	2.1800e-003	5.0000e-005	2.2300e-003		7.9196	7.9196	1.8000e-004		7.9240
Total	**3.2200e-003**	**1.8800e-003**	**0.0246**	**8.0000e-005**	**8.2100e-003**	**5.0000e-005**	**8.2700e-003**	**2.1800e-003**	**5.0000e-005**	**2.2300e-003**		**7.9196**	**7.9196**	**1.8000e-004**		**7.9240**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.6647					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**0.8836**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.6 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.2200e-003	1.8800e-003	0.0246	8.0000e-005	8.2100e-003	5.0000e-005	8.2700e-003	2.1800e-003	5.0000e-005	2.2300e-003		7.9196	7.9196	1.8000e-004		7.9240
Total	**3.2200e-003**	**1.8800e-003**	**0.0246**	**8.0000e-005**	**8.2100e-003**	**5.0000e-005**	**8.2700e-003**	**2.1800e-003**	**5.0000e-005**	**2.2300e-003**		**7.9196**	**7.9196**	**1.8000e-004**		**7.9240**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1231	0.5108	1.2406	4.5000e-003	0.3812	3.8500e-003	0.3851	0.1020	3.6100e-003	0.1056		455.2102	455.2102	0.0160		455.6109
Unmitigated	0.1239	0.5161	1.2605	4.5800e-003	0.3890	3.9200e-003	0.3929	0.1041	3.6700e-003	0.1078		463.8067	463.8067	0.0163		464.2133

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	76.16	79.28	68.96	174,554	171,062
Total	76.16	79.28	68.96	174,554	171,062

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Kilowatt Hours of Renewable Electricity Generated

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	8.6000e-003	0.0735	0.0313	4.7000e-004		5.9400e-003	5.9400e-003		5.9400e-003	5.9400e-003		93.7759	93.7759	1.8000e-003	1.7200e-003	94.3331
NaturalGas Unmitigated	0.0100	0.0855	0.0364	5.5000e-004		6.9100e-003	6.9100e-003		6.9100e-003	6.9100e-003		109.1346	109.1346	2.0900e-003	2.0000e-003	109.7831

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	927.644	0.0100	0.0855	0.0364	5.5000e-004		6.9100e-003	6.9100e-003		6.9100e-003	6.9100e-003		109.1346	109.1346	2.0900e-003	2.0000e-003	109.7831
Total		**0.0100**	**0.0855**	**0.0364**	**5.5000e-004**		**6.9100e-003**	**6.9100e-003**		**6.9100e-003**	**6.9100e-003**		**109.1346**	**109.1346**	**2.0900e-003**	**2.0000e-003**	**109.7831**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	0.797095	8.6000e-003	0.0735	0.0313	4.7000e-004		5.9400e-003	5.9400e-003		5.9400e-003	5.9400e-003		93.7759	93.7759	1.8000e-003	1.7200e-003	94.3331
Total		**8.6000e-003**	**0.0735**	**0.0313**	**4.7000e-004**		**5.9400e-003**	**5.9400e-003**		**5.9400e-003**	**5.9400e-003**		**93.7759**	**93.7759**	**1.8000e-003**	**1.7200e-003**	**94.3331**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.5845	0.0754	2.4596	6.1000e-003		0.2976	0.2976		0.2976	0.2976	42.9170	50.6002	93.5172	0.2027	9.1000e-004	98.8552
Unmitigated	0.5845	0.0754	2.4596	6.1000e-003		0.2976	0.2976		0.2976	0.2976	42.9170	50.6002	93.5172	0.2027	9.1000e-004	98.8552

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0555					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3082					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.2008	0.0678	1.7989	6.0600e-003		0.2939	0.2939		0.2939	0.2939	42.9170	49.4118	92.3287	0.2016	9.1000e-004	97.6381
Landscaping	0.0200	7.6200e-003	0.6607	3.0000e-005		3.6500e-003	3.6500e-003		3.6500e-003	3.6500e-003		1.1884	1.1884	1.1500e-003		1.2171
Total	**0.5845**	**0.0754**	**2.4596**	**6.0900e-003**		**0.2975**	**0.2975**		**0.2975**	**0.2975**	**42.9170**	**50.6002**	**93.5172**	**0.2027**	**9.1000e-004**	**98.8552**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0555					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3082					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.2008	0.0678	1.7989	6.0600e-003		0.2939	0.2939		0.2939	0.2939	42.9170	49.4118	92.3287	0.2016	9.1000e-004	97.6381
Landscaping	0.0200	7.6200e-003	0.6607	3.0000e-005		3.6500e-003	3.6500e-003		3.6500e-003	3.6500e-003		1.1884	1.1884	1.1500e-003		1.2171
Total	**0.5845**	**0.0754**	**2.4596**	**6.0900e-003**		**0.2975**	**0.2975**		**0.2975**	**0.2975**	**42.9170**	**50.6002**	**93.5172**	**0.2027**	**9.1000e-004**	**98.8552**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Vista Mar

Bay Area AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	8.00	Dwelling Unit	1.20	14,400.00	23

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	269.5	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 Intensity Factor adjusted per PG&E's mandated progress towards RPS

Land Use - Based on proposed Site Plan

Construction Phase - Based on applicant provided construction schedule

Grading - Based on applicant provided information

Woodstoves - Based on applicant provided information

Energy Use -

Mobile Land Use Mitigation - Based on inherent site design and setting

Energy Mitigation - Based on applicant provided information regarding inherent site & project design.

Water Mitigation - Based on applicant provided information regarding project design.

Trips and VMT -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	305.00
tblConstructionPhase	NumDays	200.00	305.00
tblConstructionPhase	NumDays	4.00	44.00
tblConstructionPhase	NumDays	10.00	6.00
tblConstructionPhase	NumDays	2.00	11.00
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberWood	3.44	0.00
tblGrading	AcresOfGrading	16.50	0.70
tblGrading	AcresOfGrading	5.50	0.00
tblGrading	MaterialExported	0.00	3,000.00
tblGrading	MaterialExported	0.00	100.00
tblLandUse	LotAcreage	2.60	1.20
tblProjectCharacteristics	CO2IntensityFactor	641.35	269.5

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	2.9561	18.7140	15.1514	0.0256	5.3567	0.9077	6.1792	2.9197	0.8805	3.6764	0.0000	2,341.2829	2,341.2829	0.5460	0.0000	2,351.1722
2021	2.7130	15.2764	14.8369	0.0256	0.0396	0.7789	0.8185	0.0107	0.7553	0.7660	0.0000	2,340.0122	2,340.0122	0.3787	0.0000	2,349.4800
Maximum	**2.9561**	**18.7140**	**15.1514**	**0.0256**	**5.3567**	**0.9077**	**6.1792**	**2.9197**	**0.8805**	**3.6764**	**0.0000**	**2,341.2829**	**2,341.2829**	**0.5460**	**0.0000**	**2,351.1722**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	2.9561	18.7140	15.1514	0.0256	5.3567	0.9077	6.1792	2.9197	0.8805	3.6764	0.0000	2,341.2829	2,341.2829	0.5460	0.0000	2,351.1722
2021	2.7130	15.2764	14.8369	0.0256	0.0396	0.7789	0.8185	0.0107	0.7553	0.7660	0.0000	2,340.0122	2,340.0122	0.3787	0.0000	2,349.4800
Maximum	**2.9561**	**18.7140**	**15.1514**	**0.0256**	**5.3567**	**0.9077**	**6.1792**	**2.9197**	**0.8805**	**3.6764**	**0.0000**	**2,341.2829**	**2,341.2829**	**0.5460**	**0.0000**	**2,351.1722**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.5845	0.0754	2.4596	6.1000e-003		0.2976	0.2976		0.2976	0.2976	42.9170	50.6002	93.5172	0.2027	9.1000e-004	98.8552
Energy	0.0100	0.0855	0.0364	5.5000e-004		6.9100e-003	6.9100e-003		6.9100e-003	6.9100e-003		109.1346	109.1346	2.0900e-003	2.0000e-003	109.7831
Mobile	0.1073	0.5412	1.2714	4.2900e-003	0.3890	3.9500e-003	0.3930	0.1041	3.7000e-003	0.1078		434.2279	434.2279	0.0166		434.6433
Total	**0.7017**	**0.7021**	**3.7673**	**0.0109**	**0.3890**	**0.3084**	**0.6974**	**0.1041**	**0.3082**	**0.4122**	**42.9170**	**593.9627**	**636.8796**	**0.2214**	**2.9100e-003**	**643.2816**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.5845	0.0754	2.4596	6.1000e-003		0.2976	0.2976		0.2976	0.2976	42.9170	50.6002	93.5172	0.2027	9.1000e-004	98.8552
Energy	8.6000e-003	0.0735	0.0313	4.7000e-004		5.9400e-003	5.9400e-003		5.9400e-003	5.9400e-003		93.7759	93.7759	1.8000e-003	1.7200e-003	94.3331
Mobile	0.1065	0.5354	1.2537	4.2100e-003	0.3812	3.8800e-003	0.3851	0.1020	3.6300e-003	0.1056		426.1631	426.1631	0.0164		426.5729
Total	**0.6995**	**0.6843**	**3.7445**	**0.0108**	**0.3812**	**0.3074**	**0.6886**	**0.1020**	**0.3071**	**0.4091**	**42.9170**	**570.5391**	**613.4561**	**0.2209**	**2.6300e-003**	**619.7612**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.31	2.55	0.61	1.46	2.00	0.34	1.26	2.00	0.34	0.76	0.00	3.94	3.68	0.23	9.62	3.66

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/1/2020	4/15/2020	5	11	
2	Grading	Grading	4/16/2020	6/16/2020	5	44	
3	Paving	Paving	6/17/2020	6/24/2020	5	6	
4	Building Construction	Building Construction	6/25/2020	8/25/2021	5	305	
5	Architectural Coating	Architectural Coating	7/9/2020	9/8/2021	5	305	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.7

Acres of Paving: 0

Residential Indoor: 29,160; Residential Outdoor: 9,720; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	0.00	13.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	375.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	3.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2704	0.0000	5.2704	2.8966	0.0000	2.8966			0.0000			0.0000
Off-Road	1.6299	18.3464	7.7093	0.0172		0.8210	0.8210		0.7553	0.7553		1,667.4119	1,667.4119	0.5393		1,680.8937
Total	**1.6299**	**18.3464**	**7.7093**	**0.0172**	**5.2704**	**0.8210**	**6.0913**	**2.8966**	**0.7553**	**3.6519**		**1,667.4119**	**1,667.4119**	**0.5393**		**1,680.8937**

3.2 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0100	0.3468	0.0724	9.2000e-004	0.0207	1.1300e-003	0.0218	5.6600e-003	1.0800e-003	6.7300e-003		98.8583	98.8583	5.2800e-003		98.9904
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0294	0.0208	0.2016	6.1000e-004	0.0657	4.3000e-004	0.0661	0.0174	3.9000e-004	0.0178		60.4852	60.4852	1.4800e-003		60.5222
Total	**0.0394**	**0.3676**	**0.2740**	**1.5300e-003**	**0.0864**	**1.5600e-003**	**0.0879**	**0.0231**	**1.4700e-003**	**0.0246**		**159.3436**	**159.3436**	**6.7600e-003**		**159.5126**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.2704	0.0000	5.2704	2.8966	0.0000	2.8966			0.0000			0.0000
Off-Road	1.6299	18.3464	7.7093	0.0172		0.8210	0.8210		0.7553	0.7553	0.0000	1,667.4119	1,667.4119	0.5393		1,680.8937
Total	**1.6299**	**18.3464**	**7.7093**	**0.0172**	**5.2704**	**0.8210**	**6.0913**	**2.8966**	**0.7553**	**3.6519**	**0.0000**	**1,667.4119**	**1,667.4119**	**0.5393**		**1,680.8937**

3.2 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0100	0.3468	0.0724	9.2000e-004	0.0207	1.1300e-003	0.0218	5.6600e-003	1.0800e-003	6.7300e-003		98.8583	98.8583	5.2800e-003		98.9904
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0294	0.0208	0.2016	6.1000e-004	0.0657	4.3000e-004	0.0661	0.0174	3.9000e-004	0.0178		60.4852	60.4852	1.4800e-003		60.5222
Total	**0.0394**	**0.3676**	**0.2740**	**1.5300e-003**	**0.0864**	**1.5600e-003**	**0.0879**	**0.0231**	**1.4700e-003**	**0.0246**		**159.3436**	**159.3436**	**6.7600e-003**		**159.5126**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.5412	0.0000	4.5412	2.4857	0.0000	2.4857			0.0000			0.0000
Off-Road	1.3498	15.0854	6.4543	0.0141		0.6844	0.6844		0.6296	0.6296		1,365.7183	1,365.7183	0.4417		1,376.7609
Total	**1.3498**	**15.0854**	**6.4543**	**0.0141**	**4.5412**	**0.6844**	**5.2255**	**2.4857**	**0.6296**	**3.1153**		**1,365.7183**	**1,365.7183**	**0.4417**		**1,376.7609**

3.3 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0723	2.5012	0.5223	6.6700e-003	0.1489	8.1200e-003	0.1570	0.0408	7.7700e-003	0.0486		712.9207	712.9207	0.0381		713.8731
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0294	0.0208	0.2016	6.1000e-004	0.0657	4.3000e-004	0.0661	0.0174	3.9000e-004	0.0178		60.4852	60.4852	1.4800e-003		60.5222
Total	**0.1017**	**2.5220**	**0.7239**	**7.2800e-003**	**0.2146**	**8.5500e-003**	**0.2232**	**0.0582**	**8.1600e-003**	**0.0664**		**773.4059**	**773.4059**	**0.0396**		**774.3953**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.5412	0.0000	4.5412	2.4857	0.0000	2.4857			0.0000			0.0000
Off-Road	1.3498	15.0854	6.4543	0.0141		0.6844	0.6844		0.6296	0.6296	0.0000	1,365.7183	1,365.7183	0.4417		1,376.7609
Total	**1.3498**	**15.0854**	**6.4543**	**0.0141**	**4.5412**	**0.6844**	**5.2255**	**2.4857**	**0.6296**	**3.1153**	**0.0000**	**1,365.7183**	**1,365.7183**	**0.4417**		**1,376.7609**

3.3 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0723	2.5012	0.5223	6.6700e-003	0.1489	8.1200e-003	0.1570	0.0408	7.7700e-003	0.0486		712.9207	712.9207	0.0381		713.8731
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0294	0.0208	0.2016	6.1000e-004	0.0657	4.3000e-004	0.0661	0.0174	3.9000e-004	0.0178		60.4852	60.4852	1.4800e-003		60.5222
Total	**0.1017**	**2.5220**	**0.7239**	**7.2800e-003**	**0.2146**	**8.5500e-003**	**0.2232**	**0.0582**	**8.1600e-003**	**0.0664**		**773.4059**	**773.4059**	**0.0396**		**774.3953**

3.4 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8402	8.4514	8.8758	0.0135		0.4695	0.4695		0.4328	0.4328		1,296.9461	1,296.9461	0.4111		1,307.2246
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8402**	**8.4514**	**8.8758**	**0.0135**		**0.4695**	**0.4695**		**0.4328**	**0.4328**		**1,296.9461**	**1,296.9461**	**0.4111**		**1,307.2246**

3.4 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0478	0.0338	0.3276	9.9000e-004	0.1068	6.9000e-004	0.1075	0.0283	6.4000e-004	0.0290		98.2885	98.2885	2.4000e-003		98.3486
Total	**0.0478**	**0.0338**	**0.3276**	**9.9000e-004**	**0.1068**	**6.9000e-004**	**0.1075**	**0.0283**	**6.4000e-004**	**0.0290**		**98.2885**	**98.2885**	**2.4000e-003**		**98.3486**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8402	8.4514	8.8758	0.0135		0.4695	0.4695		0.4328	0.4328	0.0000	1,296.9461	1,296.9461	0.4111		1,307.2246
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8402**	**8.4514**	**8.8758**	**0.0135**		**0.4695**	**0.4695**		**0.4328**	**0.4328**	**0.0000**	**1,296.9461**	**1,296.9461**	**0.4111**		**1,307.2246**

3.4 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0478	0.0338	0.3276	9.9000e-004	0.1068	6.9000e-004	0.1075	0.0283	6.4000e-004	0.0290		98.2885	98.2885	2.4000e-003		98.3486
Total	**0.0478**	**0.0338**	**0.3276**	**9.9000e-004**	**0.1068**	**6.9000e-004**	**0.1075**	**0.0283**	**6.4000e-004**	**0.0290**		**98.2885**	**98.2885**	**2.4000e-003**		**98.3486**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0305	14.7882	13.1881	0.0220		0.7960	0.7960		0.7688	0.7688		2,001.1595	2,001.1595	0.3715		2,010.4467
Total	**2.0305**	**14.7882**	**13.1881**	**0.0220**		**0.7960**	**0.7960**		**0.7688**	**0.7688**		**2,001.1595**	**2,001.1595**	**0.3715**		**2,010.4467**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.9900e-003	0.1152	0.0311	2.7000e-004	6.7700e-003	5.7000e-004	7.3400e-003	1.9500e-003	5.4000e-004	2.4900e-003		28.4327	28.4327	1.5500e-003		28.4716
Worker	0.0110	7.8000e-003	0.0756	2.3000e-004	0.0246	1.6000e-004	0.0248	6.5400e-003	1.5000e-004	6.6800e-003		22.6820	22.6820	5.5000e-004		22.6958
Total	**0.0150**	**0.1230**	**0.1067**	**5.0000e-004**	**0.0314**	**7.3000e-004**	**0.0321**	**8.4900e-003**	**6.9000e-004**	**9.1700e-003**		**51.1147**	**51.1147**	**2.1000e-003**		**51.1674**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0305	14.7882	13.1881	0.0220		0.7960	0.7960		0.7688	0.7688	0.0000	2,001.1595	2,001.1595	0.3715		2,010.4467
Total	**2.0305**	**14.7882**	**13.1881**	**0.0220**		**0.7960**	**0.7960**		**0.7688**	**0.7688**	**0.0000**	**2,001.1595**	**2,001.1595**	**0.3715**		**2,010.4467**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.9900e-003	0.1152	0.0311	2.7000e-004	6.7700e-003	5.7000e-004	7.3400e-003	1.9500e-003	5.4000e-004	2.4900e-003		28.4327	28.4327	1.5500e-003		28.4716
Worker	0.0110	7.8000e-003	0.0756	2.3000e-004	0.0246	1.6000e-004	0.0248	6.5400e-003	1.5000e-004	6.6800e-003		22.6820	22.6820	5.5000e-004		22.6958
Total	**0.0150**	**0.1230**	**0.1067**	**5.0000e-004**	**0.0314**	**7.3000e-004**	**0.0321**	**8.4900e-003**	**6.9000e-004**	**9.1700e-003**		**51.1147**	**51.1147**	**2.1000e-003**		**51.1674**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8125	13.6361	12.8994	0.0221		0.6843	0.6843		0.6608	0.6608		2,001.2200	2,001.2200	0.3573		2,010.1517
Total	**1.8125**	**13.6361**	**12.8994**	**0.0221**		**0.6843**	**0.6843**		**0.6608**	**0.6608**		**2,001.2200**	**2,001.2200**	**0.3573**		**2,010.1517**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.2900e-003	0.1042	0.0280	2.7000e-004	6.7700e-003	2.3000e-004	7.0000e-003	1.9500e-003	2.2000e-004	2.1700e-003		28.1627	28.1627	1.4700e-003		28.1994
Worker	0.0102	6.9600e-003	0.0689	2.2000e-004	0.0246	1.6000e-004	0.0248	6.5400e-003	1.4000e-004	6.6800e-003		21.8861	21.8861	5.0000e-004		21.8985
Total	**0.0135**	**0.1112**	**0.0970**	**4.9000e-004**	**0.0314**	**3.9000e-004**	**0.0318**	**8.4900e-003**	**3.6000e-004**	**8.8500e-003**		**50.0488**	**50.0488**	**1.9700e-003**		**50.0979**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8125	13.6361	12.8994	0.0221		0.6843	0.6843		0.6608	0.6608	0.0000	2,001.2200	2,001.2200	0.3573		2,010.1517
Total	**1.8125**	**13.6361**	**12.8994**	**0.0221**		**0.6843**	**0.6843**		**0.6608**	**0.6608**	**0.0000**	**2,001.2200**	**2,001.2200**	**0.3573**		**2,010.1517**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	3.2900e-003	0.1042	0.0280	2.7000e-004	6.7700e-003	2.3000e-004	7.0000e-003	1.9500e-003	2.2000e-004	2.1700e-003		28.1627	28.1627	1.4700e-003		28.1994
Worker	0.0102	6.9600e-003	0.0689	2.2000e-004	0.0246	1.6000e-004	0.0248	6.5400e-003	1.4000e-004	6.6800e-003		21.8861	21.8861	5.0000e-004		21.8985
Total	**0.0135**	**0.1112**	**0.0970**	**4.9000e-004**	**0.0314**	**3.9000e-004**	**0.0318**	**8.4900e-003**	**3.6000e-004**	**8.8500e-003**		**50.0488**	**50.0488**	**1.9700e-003**		**50.0979**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.6647					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**0.9069**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.6800e-003	2.6000e-003	0.0252	8.0000e-005	8.2100e-003	5.0000e-005	8.2700e-003	2.1800e-003	5.0000e-005	2.2300e-003		7.5607	7.5607	1.8000e-004		7.5653
Total	**3.6800e-003**	**2.6000e-003**	**0.0252**	**8.0000e-005**	**8.2100e-003**	**5.0000e-005**	**8.2700e-003**	**2.1800e-003**	**5.0000e-005**	**2.2300e-003**		**7.5607**	**7.5607**	**1.8000e-004**		**7.5653**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.6647					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**0.9069**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.6800e-003	2.6000e-003	0.0252	8.0000e-005	8.2100e-003	5.0000e-005	8.2700e-003	2.1800e-003	5.0000e-005	2.2300e-003		7.5607	7.5607	1.8000e-004		7.5653
Total	**3.6800e-003**	**2.6000e-003**	**0.0252**	**8.0000e-005**	**8.2100e-003**	**5.0000e-005**	**8.2700e-003**	**2.1800e-003**	**5.0000e-005**	**2.2300e-003**		**7.5607**	**7.5607**	**1.8000e-004**		**7.5653**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.6647					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**0.8836**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.6 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.4100e-003	2.3200e-003	0.0230	7.0000e-005	8.2100e-003	5.0000e-005	8.2700e-003	2.1800e-003	5.0000e-005	2.2300e-003		7.2954	7.2954	1.7000e-004		7.2995
Total	**3.4100e-003**	**2.3200e-003**	**0.0230**	**7.0000e-005**	**8.2100e-003**	**5.0000e-005**	**8.2700e-003**	**2.1800e-003**	**5.0000e-005**	**2.2300e-003**		**7.2954**	**7.2954**	**1.7000e-004**		**7.2995**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.6647					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**0.8836**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.6 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.4100e-003	2.3200e-003	0.0230	7.0000e-005	8.2100e-003	5.0000e-005	8.2700e-003	2.1800e-003	5.0000e-005	2.2300e-003		7.2954	7.2954	1.7000e-004		7.2995
Total	**3.4100e-003**	**2.3200e-003**	**0.0230**	**7.0000e-005**	**8.2100e-003**	**5.0000e-005**	**8.2700e-003**	**2.1800e-003**	**5.0000e-005**	**2.2300e-003**		**7.2954**	**7.2954**	**1.7000e-004**		**7.2995**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1065	0.5354	1.2537	4.2100e-003	0.3812	3.8800e-003	0.3851	0.1020	3.6300e-003	0.1056		426.1631	426.1631	0.0164		426.5729
Unmitigated	0.1073	0.5412	1.2714	4.2900e-003	0.3890	3.9500e-003	0.3930	0.1041	3.7000e-003	0.1078		434.2279	434.2279	0.0166		434.6433

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	76.16	79.28	68.96	174,554	171,062
Total	76.16	79.28	68.96	174,554	171,062

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Kilowatt Hours of Renewable Electricity Generated

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	8.6000e-003	0.0735	0.0313	4.7000e-004		5.9400e-003	5.9400e-003		5.9400e-003	5.9400e-003		93.7759	93.7759	1.8000e-003	1.7200e-003	94.3331
NaturalGas Unmitigated	0.0100	0.0855	0.0364	5.5000e-004		6.9100e-003	6.9100e-003		6.9100e-003	6.9100e-003		109.1346	109.1346	2.0900e-003	2.0000e-003	109.7831

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	927.644	0.0100	0.0855	0.0364	5.5000e-004		6.9100e-003	6.9100e-003		6.9100e-003	6.9100e-003		109.1346	109.1346	2.0900e-003	2.0000e-003	109.7831
Total		**0.0100**	**0.0855**	**0.0364**	**5.5000e-004**		**6.9100e-003**	**6.9100e-003**		**6.9100e-003**	**6.9100e-003**		**109.1346**	**109.1346**	**2.0900e-003**	**2.0000e-003**	**109.7831**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	0.797095	8.6000e-003	0.0735	0.0313	4.7000e-004		5.9400e-003	5.9400e-003		5.9400e-003	5.9400e-003		93.7759	93.7759	1.8000e-003	1.7200e-003	94.3331
Total		**8.6000e-003**	**0.0735**	**0.0313**	**4.7000e-004**		**5.9400e-003**	**5.9400e-003**		**5.9400e-003**	**5.9400e-003**		**93.7759**	**93.7759**	**1.8000e-003**	**1.7200e-003**	**94.3331**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.5845	0.0754	2.4596	6.1000e-003		0.2976	0.2976		0.2976	0.2976	42.9170	50.6002	93.5172	0.2027	9.1000e-004	98.8552
Unmitigated	0.5845	0.0754	2.4596	6.1000e-003		0.2976	0.2976		0.2976	0.2976	42.9170	50.6002	93.5172	0.2027	9.1000e-004	98.8552

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0555					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3082					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.2008	0.0678	1.7989	6.0600e-003		0.2939	0.2939		0.2939	0.2939	42.9170	49.4118	92.3287	0.2016	9.1000e-004	97.6381
Landscaping	0.0200	7.6200e-003	0.6607	3.0000e-005		3.6500e-003	3.6500e-003		3.6500e-003	3.6500e-003		1.1884	1.1884	1.1500e-003		1.2171
Total	**0.5845**	**0.0754**	**2.4596**	**6.0900e-003**		**0.2975**	**0.2975**		**0.2975**	**0.2975**	**42.9170**	**50.6002**	**93.5172**	**0.2027**	**9.1000e-004**	**98.8552**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0555					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3082					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.2008	0.0678	1.7989	6.0600e-003		0.2939	0.2939		0.2939	0.2939	42.9170	49.4118	92.3287	0.2016	9.1000e-004	97.6381
Landscaping	0.0200	7.6200e-003	0.6607	3.0000e-005		3.6500e-003	3.6500e-003		3.6500e-003	3.6500e-003		1.1884	1.1884	1.1500e-003		1.2171
Total	**0.5845**	**0.0754**	**2.4596**	**6.0900e-003**		**0.2975**	**0.2975**		**0.2975**	**0.2975**	**42.9170**	**50.6002**	**93.5172**	**0.2027**	**9.1000e-004**	**98.8552**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Vista Mar

Bay Area AQMD Air District, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Air Compressors	Diesel	No Change	0	1	No Change	0.00
Cement and Mortar Mixers	Diesel	No Change	0	1	No Change	0.00
Cranes	Diesel	No Change	0	1	No Change	0.00
Forklifts	Diesel	No Change	0	1	No Change	0.00
Generator Sets	Diesel	No Change	0	1	No Change	0.00
Graders	Diesel	No Change	0	2	No Change	0.00
Pavers	Diesel	No Change	0	1	No Change	0.00
Paving Equipment	Diesel	No Change	0	1	No Change	0.00
Rollers	Diesel	No Change	0	1	No Change	0.00
Rubber Tired Dozers	Diesel	No Change	0	2	No Change	0.00
Tractors/Loaders/Backhoes	Diesel	No Change	0	4	No Change	0.00
Welders	Diesel	No Change	0	3	No Change	0.00

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Unmitigated tons/yr						Unmitigated mt/yr					
Air Compressors	3.48500E-002	2.42730E-001	2.78050E-001	4.50000E-004	1.54100E-002	1.54100E-002	0.00000E+000	3.89371E+001	3.89371E+001	2.81000E-003	0.00000E+000	3.90075E+001
Cement and Mortar Mixers	1.30000E-004	8.30000E-004	6.90000E-004	0.00000E+000	3.00000E-005	3.00000E-005	0.00000E+000	1.03110E-001	1.03110E-001	1.00000E-005	0.00000E+000	1.03380E-001
Cranes	4.92900E-002	5.82290E-001	2.33550E-001	6.60000E-004	2.38100E-002	2.19100E-002	0.00000E+000	5.79767E+001	5.79767E+001	1.87500E-002	0.00000E+000	5.84454E+001
Forklifts	1.55400E-002	1.40900E-001	1.34210E-001	1.70000E-004	1.02300E-002	9.42000E-003	0.00000E+000	1.53596E+001	1.53596E+001	4.97000E-003	0.00000E+000	1.54838E+001
Generator Sets	5.73400E-002	5.04090E-001	5.63340E-001	1.00000E-003	2.75200E-002	2.75200E-002	0.00000E+000	8.61941E+001	8.61941E+001	4.60000E-003	0.00000E+000	8.63092E+001
Graders	1.04700E-002	1.39160E-001	3.99200E-002	1.50000E-004	4.45000E-003	4.09000E-003	0.00000E+000	1.28274E+001	1.28274E+001	4.15000E-003	0.00000E+000	1.29311E+001
Pavers	5.90000E-004	6.32000E-003	6.52000E-003	1.00000E-005	3.10000E-004	2.80000E-004	0.00000E+000	9.29290E-001	9.29290E-001	3.00000E-004	0.00000E+000	9.36800E-001
Paving Equipment	6.20000E-004	6.42000E-003	7.60000E-003	1.00000E-005	3.20000E-004	3.00000E-004	0.00000E+000	1.07373E+000	1.07373E+000	3.50000E-004	0.00000E+000	1.08241E+000
Rollers	5.50000E-004	5.46000E-003	4.97000E-003	1.00000E-005	3.50000E-004	3.20000E-004	0.00000E+000	6.05020E-001	6.05020E-001	2.00000E-004	0.00000E+000	6.09920E-001
Rubber Tired Dozers	2.30100E-002	2.41520E-001	8.80500E-002	1.80000E-004	1.18300E-002	1.08800E-002	0.00000E+000	1.59962E+001	1.59962E+001	5.17000E-003	0.00000E+000	1.61255E+001
Tractors/Loaders/ Backhoes	2.83700E-002	2.85930E-001	3.22770E-001	4.40000E-004	1.75700E-002	1.61600E-002	0.00000E+000	3.87867E+001	3.87867E+001	1.25400E-002	0.00000E+000	3.91004E+001
Welders	1.46510E-001	7.03060E-001	7.96190E-001	1.17000E-003	3.65100E-002	3.65100E-002	0.00000E+000	8.61109E+001	8.61109E+001	1.18900E-002	0.00000E+000	8.64082E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Mitigated tons/yr						Mitigated mt/yr					
Air Compressors	3.48500E-002	2.42730E-001	2.78050E-001	4.50000E-004	1.54100E-002	1.54100E-002	0.00000E+000	3.89371E+001	3.89371E+001	2.81000E-003	0.00000E+000	3.90074E+001
Cement and Mortar Mixers	1.30000E-004	8.30000E-004	6.90000E-004	0.00000E+000	3.00000E-005	3.00000E-005	0.00000E+000	1.03110E-001	1.03110E-001	1.00000E-005	0.00000E+000	1.03380E-001
Cranes	4.92900E-002	5.82290E-001	2.33550E-001	6.60000E-004	2.38100E-002	2.19100E-002	0.00000E+000	5.79766E+001	5.79766E+001	1.87500E-002	0.00000E+000	5.84454E+001
Forklifts	1.55400E-002	1.40900E-001	1.34210E-001	1.70000E-004	1.02300E-002	9.42000E-003	0.00000E+000	1.53596E+001	1.53596E+001	4.97000E-003	0.00000E+000	1.54837E+001
Generator Sets	5.73400E-002	5.04080E-001	5.63330E-001	1.00000E-003	2.75200E-002	2.75200E-002	0.00000E+000	8.61940E+001	8.61940E+001	4.60000E-003	0.00000E+000	8.63091E+001
Graders	1.04700E-002	1.39160E-001	3.99200E-002	1.50000E-004	4.45000E-003	4.09000E-003	0.00000E+000	1.28274E+001	1.28274E+001	4.15000E-003	0.00000E+000	1.29311E+001
Pavers	5.90000E-004	6.32000E-003	6.52000E-003	1.00000E-005	3.10000E-004	2.80000E-004	0.00000E+000	9.29280E-001	9.29280E-001	3.00000E-004	0.00000E+000	9.36800E-001
Paving Equipment	6.20000E-004	6.42000E-003	7.60000E-003	1.00000E-005	3.20000E-004	3.00000E-004	0.00000E+000	1.07373E+000	1.07373E+000	3.50000E-004	0.00000E+000	1.08241E+000
Rollers	5.50000E-004	5.46000E-003	4.97000E-003	1.00000E-005	3.50000E-004	3.20000E-004	0.00000E+000	6.05020E-001	6.05020E-001	2.00000E-004	0.00000E+000	6.09910E-001
Rubber Tired Dozers	2.30100E-002	2.41520E-001	8.80500E-002	1.80000E-004	1.18300E-002	1.08800E-002	0.00000E+000	1.59961E+001	1.59961E+001	5.17000E-003	0.00000E+000	1.61255E+001
Tractors/Loaders/Backhoes	2.83700E-002	2.85930E-001	3.22770E-001	4.40000E-004	1.75700E-002	1.61600E-002	0.00000E+000	3.87867E+001	3.87867E+001	1.25400E-002	0.00000E+000	3.91003E+001
Welders	1.46510E-001	7.03060E-001	7.96190E-001	1.17000E-003	3.65100E-002	3.65100E-002	0.00000E+000	8.61108E+001	8.61108E+001	1.18900E-002	0.00000E+000	8.64081E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.28412E-006	1.28412E-006	0.00000E+000	0.00000E+000	1.28181E-006
Cement and Mortar Mixers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Cranes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.20738E-006	1.20738E-006	0.00000E+000	0.00000E+000	1.19770E-006
Forklifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.30212E-006	1.30212E-006	0.00000E+000	0.00000E+000	1.29168E-006
Generator Sets	0.00000E+000	1.98377E-005	1.77513E-005	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.27619E-006	1.27619E-006	0.00000E+000	0.00000E+000	1.15863E-006
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	7.79580E-007	7.79580E-007	0.00000E+000	0.00000E+000	1.54665E-006
Pavers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.07609E-005	1.07609E-005	0.00000E+000	0.00000E+000	0.00000E+000
Paving Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Rollers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.63956E-005
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.25030E-006	1.25030E-006	0.00000E+000	0.00000E+000	1.24027E-006
Tractors/Loaders/Backhoes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.28910E-006	1.28910E-006	0.00000E+000	0.00000E+000	1.27876E-006
Welders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.16129E-006	1.16129E-006	0.00000E+000	0.00000E+000	1.15730E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input		Mitigation Input		Mitigation Input	
No	Soil Stabilizer for unpaved Roads	PM10 Reduction		PM2.5 Reduction			
No	Replace Ground Cover of Area Disturbed	PM10 Reduction		PM2.5 Reduction			
No	Water Exposed Area	PM10 Reduction		PM2.5 Reduction		Frequency (per day)	
No	Unpaved Road Mitigation	Moisture Content %		Vehicle Speed (mph)	0.00		

No	Clean Paved Road	% PM Reduction	0.00				

		Unmitigated		Mitigated		Percent Reduction	
Phase	Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Architectural Coating	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Grading	Fugitive Dust	0.10	0.05	0.10	0.05	0.00	0.00
Grading	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	Fugitive Dust	0.03	0.02	0.03	0.02	0.00	0.00
Site Preparation	Roads	0.00	0.00	0.00	0.00	0.00	0.00

Operational Percent Reduction Summary

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.04	100.04	100.00	100.00	100.04
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.75	1.06	1.45	1.33	1.47	1.56	0.00	1.85	1.85	1.57	0.00	1.85
Natural Gas	14.21	14.04	14.16	10.00	14.29	14.29	0.00	14.07	14.07	14.29	15.15	14.07
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	30.00	38.69	36.48	30.05	29.27	33.55
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Project Setting: Low Density Suburban

Mitigation	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value
No	Land Use	Increase Density	0.00	0.00	0.00	
No	Land Use	Increase Diversity	-0.01	0.13		
No	Land Use	Improve Walkability Design	0.00	0.00		
No	Land Use	Improve Destination Accessibility	0.00	0.00		
No	Land Use	Increase Transit Accessibility	0.25	0.00		
No	Land Use	Integrate Below Market Rate Housing	0.00	0.00		
	Land Use	Land Use SubTotal	0.00			

Yes	Neighborhood Enhancements	Improve Pedestrian Network	2.00	Project Site and Connecting Off-Site		
No	Neighborhood Enhancements	Provide Traffic Calming Measures	0.00			
No	Neighborhood Enhancements	Implement NEV Network	0.00			
	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.02			
No	Parking Policy Pricing	Limit Parking Supply	0.00	0.00		
No	Parking Policy Pricing	Unbundle Parking Costs	0.00	0.00		
No	Parking Policy Pricing	On-street Market Pricing	0.00	0.00		
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00			
No	Transit Improvements	Provide BRT System	0.00	0.00		
No	Transit Improvements	Expand Transit Network	0.00	0.00		
No	Transit Improvements	Increase Transit Frequency	0.00		0.00	
	Transit Improvements	Transit Improvements Subtotal	0.00			
		Land Use and Site Enhancement Subtotal	0.02			
No	Commute	Implement Trip Reduction Program				
No	Commute	Transit Subsidy				
No	Commute	Implement Employee Parking "Cash Out"	3.00			
No	Commute	Workplace Parking Charge		0.00		
No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00			
No	Commute	Market Commute Trip Reduction Option	0.00			
No	Commute	Employee Vanpool/Shuttle	0.00		2.00	
No	Commute	Provide Ride Sharing Program	5.00			
	Commute	Commute Subtotal	0.00			

No	School Trip	Implement School Bus Program	0.00			
		Total VMT Reduction	0.02			

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
No	Only Natural Gas Hearth	
No	No Hearth	
No	Use Low VOC Cleaning Supplies	
No	Use Low VOC Paint (Residential Interior)	100.00
No	Use Low VOC Paint (Residential Exterior)	150.00
No	Use Low VOC Paint (Non-residential Interior)	100.00
No	Use Low VOC Paint (Non-residential Exterior)	150.00
No	Use Low VOC Paint (Parking)	150.00
No	% Electric Lawnmower	
No	% Electric Leafblower	
No	% Electric Chainsaw	

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
Yes	Exceed Title 24	15.00	
No	Install High Efficiency Lighting	0.00	
Yes	On-site Renewable	24.00	100.00

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00
DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
Yes	Apply Water Conservation on Strategy	30.00	60.00
No	Use Reclaimed Water	0.00	0.00
No	Use Grey Water	0.00	
No	Install low-flow bathroom faucet	32.00	
No	Install low-flow Kitchen faucet	18.00	
No	Install low-flow Toilet	20.00	
No	Install low-flow Shower	20.00	
No	Turf Reduction	0.00	
No	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape	0.00	0.00

Solid Waste Mitigation

Mitigation Measures	Input Value

Institute Recycling and Composting Services Percent Reduction in Waste Disposed	

APPENDIX C
WRA Responses to Comments

September 15, 2020

Bonny O'Connor, Associate Planner
City of Pacifica Planning Department
1800 Francisco Blvd.
Pacifica, CA 94044
o'connorb@ci.pacifica.ca.us

RE: Vista Mar Project, Pacifica – Response to comments by Dr. Shawn Smallwood

Dear Ms. O'Connor:

This letter provides responses and associated information related to comments submitted on the Initial Study – Mitigated Negative Declaration (IS/MND) for the Vista Mar Project (Project) in a letter dated August 30, 2020. These responses address comments made by Dr. Shawn Smallwood in the comment letter. WRA, Inc. (WRA) prepared a Biological Resources Assessment (BRA) for the project that was used in the preparation of the IS/MND. WRA has reviewed the comments by Dr. Smallwood and is providing the following responses and associated information to further clarify the findings of the BRA and conditions of the project site (Study Area).

For ease of reference, the following sections correspond with the headings used in Dr. Smallwood's letter.

Site Visit

The original WRA reconnaissance site visit was conducted on July 7, 2019 by Dr. Brian Kearns (the author of this letter), who is an experienced wildlife biologist with a specifically avian focus, and Gavin Albertoli, a certified arborist and experienced wetland scientist. This site visit was conducted during early morning hours under fog cover when wildlife species would generally be sufficiently active to be easily observed. Dr. Smallwood states that he observed 17 vertebrate wildlife species on-site during his site visits on August 20, 2020. WRA acknowledges that a list of observed species was omitted from the original BRA report; however, no special-status species were observed by WRA biologists during their site visit, and observed species were generally typical of this type of urban/open space landscape. It is important to note that while WRA's site visit included observation of species present within the Study Area, WRA's survey was not intended to constitute a dedicated bird/wildlife survey (e.g., a point-count survey). As accurately stated by Dr. Smallwood, species composition on a given day may vary dependent on various factors, including time of year, time of day, weather, and others.

Additionally, WRA only recorded species that were observed in direct association with the site. WRA does not typically consider species that are observed only in aerial transit well above a given site to be present there. This includes species that may be observed on nearby sites. Aerial foraging within the Study Area's airspace would warrant inclusion in some cases, e.g., for raptors (birds of prey) and bats, if relevant. However, waterbirds flying from one habitat patch to another (e.g., double-crested cormorant) generally do not warrant such inclusion, or at least such

observations should be clarified that they only involved birds observed in aerial transit, and regarded as largely incidental. For these reasons, bird species (and other wildlife) are generally assessed based on the likelihood of a site to support critical life functions, rather than the potential for the species to simply fly over.

Dr. Smallwood states that he observed three special-status species on-site, including FGC Birds of prey and TWL ("Taxa to Watch List"; Shuford and Gardali 2008), and suggests that several more have been detected by locals. Although the details of approaches may vary somewhat, species typically regarded as "special-status" in this context include those that have been formally listed, or are candidates for such listing under the federal Endangered Species Act (ESA) and/or California Endangered Species Act (CESA); CDFW Fully Protected Species (CFP); and, CDFW Species of Special Concern (SSC). Although SSCs generally have no special legal status, they are given special consideration under CEQA. Bat species are also evaluated for conservation status by the Western Bat Working Group (WBWG), a non-governmental entity; bats named as a "High Priority" or "Medium Priority" species for conservation by the WBWG are typically considered special-status.

Most of the observed species that Dr. Smallwood classifies as "special-status" are common and widespread species that are not typically given special consideration under CEQA or even included on CDFW's highly inclusive Special Animals List.[1] For example, simply being referenced in the California Fish and Game Code (e.g., all birds of prey) does not indicate that a species is special-status. Of the species observed by Dr. Smallwood, white-tailed kite (CFP) is the only species that should clearly be considered special-status. Note also that WRA's assessment identified white-tailed kite as having the potential to occur on-site, and included as well an assessment of Allen's hummingbird, which Dr. Smallwood specifically mentions observing on site.

Biological Impacts Assessment

Dr. Smallwood states that WRA's species determinations were deficient, as species that were determined to be unlikely to occur by WRA have been documented in the vicinity on eBird (an Internet-based database for observations of wild birds) or by locals making incidental observations of the Study Area. Noted special-status species included in this list include Swainson's hawk, peregrine falcon, loggerhead shrike, and San Francisco common yellowthroat. WRA would like to acknowledge that San Francisco common yellowthroat may, on occasion, occur within the Study Area during dispersal and other movements. However, the special-status San Francisco Bay Area sub-species is heavily associated with wetland and marsh habitats[2], neither of which occur within the Study area. Regardless, nesting bird-related Mitigation Measures in both the BRA and IS/MND would reduce the impacts to this species to a less than significant level in the unlikely event that an individual selected the Study Area as a nesting site. WRA generally analyzed species potential based on their likelihood to occupy habitat within the Study Area, or otherwise rely on the Study Area for critical life functions, rather than their simple known presence in the greater vicinity or region. Natural and semi-natural habitats in the vicinity are variable and include many land cover types that are not comparable in quality or extent to the Study Area (i.e., coastal bluffs, dense coniferous forests, perennial wetlands), making searches

[1] California Department of Fish and Wildlife, Natural Diversity Database. July 2020. Special Animals List. Periodic publication. 67 pp.

[2] Shuford, W. D. and Gardali, T., eds. 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.

of local databases inclusive of species that may not utilize the Study Area during their typical life history. As stated in the previous section, birds may be observed flying between suitable habitat patches or during longer-distance migrations in a manner that is largely incidental to the conditions of the Study Area. While eBird and similar databases, as well as local observations, are valuable resources and often are referenced when making species determinations, other factors were considered during the impacts assessment including current site conditions and habitats present and adjacent land use and habitat.

Dr. Smallwood posits that special-status bat species were not sufficiently addressed in the report, specifically referencing hoary bat. The California Fish and Game Code offers protection to bat species and their roosting habitat, including individual roosts and maternity colonies. For example, hoary bats are strongly associated with forested habitats[3]. While trees are present within the Study Area that could provide temporary roosts (e.g., night roosts) for bat species including hoary bat, these trees are exposed to wind and elements due to their west-facing aspect, making them collectively a relatively poor candidate for bat roosting and thermoregulation. Most of the trees observed within the Study Area are also relatively small, and were not observed by WRA to provide suitably large/deep hollows for the establishment of maternity or hibernacula roosts. The site is also currently subjected to regular direct and indirect anthropogenic disturbance mainly consisting of vehicular and pedestrian traffic from adjacent development, which is a deterrent to roosting for several special-status bat species. Therefore, WRA's assessment regarding bats is accurate, and the Project will not constitute a significant impact to common or special status bat species under CEQA.

Lastly, Dr. Smallwood suggests that WRA's assessment is deficient with regard to California red-legged frog (CRLF) and San Francisco garter snake (SFGS). Dr. Smallwood further claims that "WRA implies that the known occurrences are the only occurrences for SFGS, but WRA cannot know this to be true". It is true that these species are known to occur in the general vicinity of the Study Area, and also that individuals of either species may exist in local areas that are not documented in databases accessed while generating the BRA. Nonetheless, WRA maintains that the proposed Project does not constitute a significant impact under CEQA for either of these species because: 1) neither species is expected to occur within the Study Area, 2) suitable habitat is not present in the immediate vicinity of the Study Area, and 3) impacts within the Study Area will not disrupt behavior or dispersal opportunities for either species in the larger geographic context. More detailed justifications for each species are outlined below.

CRLF requires aquatic habitat for breeding that remains inundated for at least 20 consecutive weeks out of the year[4]. Such habitat is not present within the Study Area, or in the general vicinity of the Study Area. The only aquatic habitat observed by WRA during the site assessment was an ephemeral drainage ditch that terminates in a culvert, which would not provide suitable breeding habitat for this species. Although Dr. Smallwood suggests that a retention basin is present in the same tract of open space as the Study Area that could provide CRLF breeding habitat, he does not specify the exact location of the basin and WRA was not able to identify such a retention basin based on a post hoc analysis of available historical aerial imagery[5]. The closest

[3] Western Bat Working Group (WBWG). 2015. Species account for Hoary Bat (Lasiurus cinereus). http://wbwg.org/western-bat-species/ Prepared by: Betsy C. Bolster.
[4] U.S. Fish and Wildlife Service (USFWS). 2010. Endangered and Threatened Wildlife and Plants: Revised Designation of Critical Habitat for California Red-legged Frog; Final Rule. Federal Register, Vol. 75, No. 51. 12815-12959.
[5] Google. 2020. Google Earth. Available online at: https://www.google.com/earth/. Accessed: September.

documented occurrence of CRLF, and thus the closest documented potential source population, is approximately 0.9 mile to the southeast of the Study Area, and is linked to a large aquatic feature in a largely undisturbed tract of open space[6]. The area between this documented occurrence and the Study Area is largely developed, and contains dispersal barriers such as roads and existing residential housing. Although Dr. Smallwood is correct in suggesting that CRLF (and SFGS) are capable of crossing roads, roadways are generally considered to be an impedance to wildlife movement, particularly for herpetofauna (reptiles and amphibians). Furthermore, the Study Area itself is not a dispersal bottleneck for CRLF in the context of the adjacent open space and associated habitats. With all impacts considered, in the unlikely event that a CRLF would chose to disperse through the vicinity of the Study Area, ample space is present to allow any CRLF individuals the ability to move through open space to the north. Given these factors, WRA maintains that CRLF is unlikely to occur within the Study Area, and that potential impacts to CRLF due to Project implementation will be less than significant under CEQA.

In this locality, SFGS is generally documented along the coast; the nearest known populations existing at Sharp Park around Laguna Salada and within the Mori Point recreation area[7]. These areas are both more than 1.5 miles from the Study Area and are on the west side of US Highway 101, which should be considered to represent a complete barrier to dispersal from these known source populations. Although this species may use upland habitats during dispersal movements, SFGS generally prefer densely vegetated ponds with nearby open areas that support a suitable prey base[8]. Amphibian species, including CRLF, represent an important component of this prey base, although SFGS may forage on small burrowing mammals as well. No aquatic habitats that would support a robust amphibian population are present within the Study Area or immediate vicinity. Few burrows were observed by WRA within the Study Area, suggesting that, even barring the presence of amphibian prey, the Study Area likely provides limited foraging opportunities for SFGS. Due to the lack of aquatic habitat present within the Study Area or within 500 feet of the Study Area, WRA maintains that SFGS are unlikely to occur even during upland movements. Lastly, given the orientation and location of the Study Area, Project activities will not impede the movement of SFGS by creating a bottleneck or dead end. As such, potential impacts to SFGS will be less than significant under CEQA.

Habitat Loss

Dr. Smallwood states that the Project will result in permanent habitat losses, specifically for avian species. He supports these claims using nesting density numbers obtained from studies conducted by Young (1948)[9] and Yahner (1982)[10] in “environments where birds were abundant, similar to the situation at the Project site”. While it is true that the Study Area is located adjacent to open space where birds are generally present, it is a misleading extrapolation to use density numbers from the aforementioned studies to determine how many nests will be lost as a result of the proposed Project. First, both of the studies cited by Dr. Smallwood were conducted on ecological reserve areas or agricultural research stations, and, despite any potential habitat similarities, are not considered by WRA to be representative of the urban-open space landscape

[6] California Department of Fish and Wildlife. 2020. California Natural Diversity Database. Accessed September 2020.
[7] CDFW 2020, suppressed data.
[8] USFWS. 2006. San Francisco Garter Snake (Thamnophis sirtalis tetrataenia) 5-Year Review: Summary and Evaluation. Sacramento Fish and Wildlife Office. September.
[9] Young, H. 1948. A comparative study of nesting birds in a five-acre park. The Wilson Bulletin 61:36-47.
[10] Yahner, R. H. 1982. Avian nest densities and nest-site selection in farmstead shelterbelts. The Wilson Bulletin 94:156-175.

present in the immediate vicinity of the Study Area. Second, both of these studies were conducted in the Midwestern region of the United States (Wisconsin and Minnesota, respectively). Geographic location is important to consider with regard to biological resources, as it dictates differences in species assemblage, differences in ecosystem productivity, and the difference in the length of the available nesting season in a Mediterranean climate versus a climate where harsh winters would preclude bird nesting until late spring.

Although the proposed Project will remove a small amount of potential bird nesting habitat, the overall impact of the Project to available habitat and wildlife resources in the vicinity cannot be considered significant under CEQA. When considered in the overall regional context, activities on the Study Area will not have a significant impact on available nesting habitat for avian species. The Project will persist adjacent to habitat that is generally similar to the Study Area, indicating that birds that might otherwise nest within the Study Area will not be forced to make large movements to find suitable habitat after the Project is completed. In fact, many of the species observed during WRA's and Dr. Smallwood's site visits are known to be tolerant of anthropogenic disturbance and development, and would not experience significant displacement effects as a result of the proposed project. Furthermore, Mitigation Measures included in both the BRA and IS/MND should prevent significant impacts to any birds that may be actively nesting within the Study Area.

Wildlife Movement

Dr. Smallwood states that the construction proposed on the Project site is likely to cause a potentially significant adverse biological impact stemming from the disruption of large-scale migration patterns and local movements, habitat fragmentation, and interruption of critical landscape functionality, specifically for dispersing avian species. Based on surrounding land uses and the prevalence of non-developed (natural/semi-natural) land covers, it is not warranted to consider the site critical to wildlife movement in the area. While some species, particularly volant species, can use "stepping stone" dispersal habitats, or closely spaced pockets of habitat between larger core habitat, above all wildlife corridors must link two areas of core habitat and should not direct wildlife to developed areas or areas that are otherwise void of core habitat[11]. The Study Area is adjacent to several consistently trafficked roadways, and a significant amount of residential development. The site is additionally located within 0.3 mile of Milagra Ridge and several other large and small patches of undeveloped land that provide higher quality habitat and may facilitate movement of wildlife species. Furthermore, the development proposed within the Study Area will not eliminate the utility of adjacent open space as a movement corridor. It should be noted as well that the majority of the bird species observed on-site are tolerant of anthropogenic activities and disturbance; indeed, these species often occur year-round, inclusive of successful breeding, in developed areas (e.g., Anna's hummingbird, black phoebe, California scrub jay, American crow, common raven, house finch, etc.). Therefore, the proposed Project is not anticipated to result in any significant impacts to local or regional wildlife movement, let alone result in the loss of critically important movement habitat.

Window Collisions

The comments from Dr. Smallwood regarding bird collisions were noted. WRA has conducted numerous bird-safe design analyses for projects around the Bay Area, and is well-versed in various city and regional guidelines dictating best design practices to minimize bird strikes,

[11] Hilty, J.A., W.Z. Lidicker Jr., and A.M. Merenlender. 2006. Corridor Ecology. Pp. 195-198. Island Press, Washington D.C.

including, in part, those mentioned by Dr. Smallwood. There is increasing awareness that collision with buildings and structures is a noteworthy cause of avian mortality worldwide. As noted by Dr. Smallwood, a number of design factors are associated with the average rate of bird collisions, including the total extent of exterior glazing (glass; e.g., windows), size of individual contiguous glazing panels, glazing reflectivity, placement and types of landscaping, details of on-site artificial night lighting, and other factors.

WRA reviewed an architectural design sheet for the proposed development within the Study Area ("Vista Mar Development – Monterey Road" by JC Engineering). The design sheet shows similar external elevations for all proposed units, all of which do not exceed three stories in height. Despite Dr. Smallwood's claim that glazing is extensive on the proposed structures, glazing comprises < 50% of the total building façade. The glazing proposed consists entirely of windows for the residential units, all of which are isolated from each other at regular intervals (versus being grouped/conjoined to form larger contiguous window panels), and each is further divided into smaller areas by mullions. The elevations also feature forms of architectural relief (overhangs, spatially-offset adjacent faces) as well as varied (opaque) materials and colors, all of which will "break up" the exterior visually (i.e., create "visual noise") and increase the likelihood that birds will perceive the building overall as a solid surface. Finally, balcony guardrails in the development appear to be made of metal bars, versus transparent glazing (which poses a relatively high bird collision risk). Overall, by current architectural/design standards as well as according to the relatively strict directives put forth in the City of San Francisco's Bird-Safe Design Guidelines[12] mentioned in Dr. Smallwood's comments, the development (as reflected in the designs referenced above) appears to WRA to provide a relatively minimal risk of bird collisions. The number of birds that will collide with the building over time is virtually impossible to estimate, and thus speculative. In any event, these impacts are not anticipated to be significant at a regional or even local scale.

Cumulative Impacts

Dr. Smallwood suggests that the IS/MND does not adequately address cumulative impacts of the Project, specifically stating that "the IS/MND does not even provide a list of existing and foreseeable projects that would contribute cumulative effects on wildlife". However, the IS/MND states that "the proposed project would be consistent with the General Plan land use designation and zoning designation for the project site and, as such, the proposed project was included in the cumulative analysis of the City buildout per the City's General Plan". In addition to land use concerns, it is clearly stated in the IS/MND that mitigation measures related to biological resources will reduce all potential impacts to a less than significant level. Given that the Project is consistent with surrounding land uses and has been considered as such in long term planning efforts, WRA agrees with the determination that any cumulative effects of the Project will be less than significant. As such, the Project's contribution to any cumulative impacts is not cumulatively considerable and the IS/MND's discussion of cumulative wildlife impacts is not deficient, as suggested by the commenter. (See also IS/MND Page 85.)

[12] San Francisco Planning Department. 2011. Standards for bird-safe buildings. San Francisco Planning Department, City and County of San Francisco, California.

Mitigation Measures

Measures IV-1 and IV-3: Preconstruction surveys for San Francisco dusky-footed woodrats and nesting birds

Dr. Smallwood's comments suggest that preconstruction surveys for both San Francisco dusky-footed woodrat and nesting birds will not sufficiently detect nests that are potentially present, and also do not sufficiently reduce the impact of this Project, or projects in general, to a less-than-significant level. This statement is misleading.

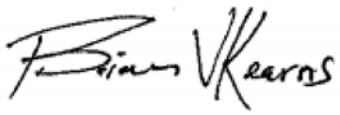
If special-status or common (i.e., those protected only by the MBTA and CFGC) avian species are nesting within the Study Area, pre-construction surveys should detect active nests, and avoidance would consequently be required under Mitigation Measures included in the BRA and IS/MND. There is some limited potential for the site to support nesting by common raptors, i.e., via the trees that are present. However, raptor nests are typically placed high in trees or on other large structures, and are conspicuous to a skilled observer. Vegetation within the site, although dense in some areas (specifically within willow thickets), is not sufficiently dense to prohibit access of a surveying biologist; thus, all areas could be surveyed, and any nests present would likely be detected. It should also be noted that pre-construction nesting bird survey best practices typically include behavioral observation as well as simply looking for nest structures, which greatly increases the likelihood of identifying active nests. A skilled surveyor would thus not be solely dependent on seeing the physical nest to assess a potential impact to an actively nesting bird.

San Francisco dusky-footed woodrat generally produce conspicuous stick nests/structures that are easily identifiable to a qualified biologist. The wording of the mitigation measure included in the BRA for this species allows for ample time for any young that are identified during dismantling of the nests to leave the nest of their own accord. Thus, WRA finds the distinction made by Dr. Smallwood between "pre-construction" and "pre-project detection" surveys to be moot, as the end result is that any nests that may be present would be protected, and any individuals would be protected from harm, thus avoiding a significant impact under CEQA.

Overall, WRA continues to assert that determinations made in the 2019 BRA are accurate, and that suggested mitigation measures for identified impacts will be sufficient to reduce the overall impact of the Project to a less than significant level under CEQA.

Please contact me at kearns@wra-ca.com with any questions regarding the work conducted by WRA on this Project.

Sincerely,



Brian Kearns, Ph.D.
Wildlife Biologist