Main Gate Road and "C" Street

REVISED INITIAL STUDY

PUBLIC REVIEW DRAFT
OCTOBER 2016

LEAD AGENCY

CITY OF NOVATO
PLANNING DIVISION
922 MACHIN AVENUE
NOVATO, CA 94945

URBAN
PLANNING
PARTNERS
INC.

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PREFACE AND PURPOSE OF THE REVISED IS/MND

The Main Gate Road and "C" Street Project Initial Study (IS) was circulated for public review from July 1, 2015 to July 31, 2015. Subsequent to circulation of the IS, the City determined that additional information relating to the environmental remediation actions should be included in the IS. The purpose of revising the IS/Mitigated Negative Declaration (IS/MND) is twofold:

Firstly, the revised IS/MND incorporates updated information on the remediation process from the updated Draft Remedial Action Plan (Draft RAP) released by the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) for public review in October 2015. The draft IS/MND published in July 2015 for public review relied on a Draft RAP from April 2015 that was reviewed by the Regional Water Board and Department of Toxic Substances Control (DTSC) but had not yet been released for public comment. This revised IS/MND considers the most recent version of the Draft RAP as it serves as part of the project description and the Regional Water Board and DTSC will rely on the IS/MND approved by the City of Novato (City) before approving the Final RAP.

Secondly, the revised IS/MND incorporates additional mitigation measures in the Air Quality and Hazards sections to strengthen monitoring controls and City oversight over the remediation process. These include specific protocols for safely remediating the site to protect the surrounding community. These additional measures respond to concerns voiced by the public.

Project History

In 2013, Thompson Development, LLC submitted an application for a 31-unit townhome project at 970 "C" Street, which is the northwest corner of Main Gate and "C" Street in the Hamilton neighborhood of Novato. A gas station had previously been on the site. As described in detail in the Project Description, the site is required to be remediated in order to allow the site to be developed for a residential use. Specifically, the Regional Water Board, DTSC, and the federal Department of the Navy must approve the release of a land use covenant and deed restriction on the property, which currently prohibit residential use.

The Design Review Commission ("DRC") conducted five public workshops on this project on October 2, 2013, December 4, 2013, February 5, 2014, March 19, 2014, and May 7, 2014, before recommending approval of the site plan and architectural theme to the Planning Commission and City Council.

In April of 2015, asbestos abatement and demolition of the previous gas station occurred. Additionally, all wells at the project site (nine monitoring wells, three soil gas/groundwater monitoring points, and eight sparge/soil vapor extraction wells previously used for remediation activities) were removed in 2015 in accordance with a permit approved by the Environmental Health Services Division of the Marin County Community Development Agency.

The IS/MND was published on July 1, 2015 for a 30-day public comment period. Written comments were submitted by the California Department of Transportation (Caltrans), the North Marin Water District (NMWD), the Regional Water Board, and a member of the public, Mr. Eric Van Balen (letters are included in Appendix A). Caltrans requested an analysis of traffic impacts at specific locations, promoting access to walking, bicycling, and transit, and the need for all motor carriers and drivers involved in the transportation of hazardous materials to comply with federal and State regulations. The NMWD letter outlined mandatory water conservation measures and the requirement to install a back-flow prevention device. The Regional Water Board letter requested clarification on the schedule and process of the IS/MND. They also emphasized that the IS/MND should clearly and consistently explain that DTSC and the Regional Water Board would not remove any land use restriction until after the remediation work was completed and it had been demonstrated, per the requirements of DTSC and the Regional Water Board, that the site was suitable for residential use. Lastly, Mr. Van Balen's letter detailed his concern regarding the demolition work that was conducted in April of 2015 and the need for a viable remediation plan.

The City held a Planning Commission meeting on July 13, 2015 to discuss the City's IS/MND prepared for the proposed project. A total of 17 members of the public provided verbal comments (Meeting Minutes included in Appendix A). Concerns were raised about the lack of monitoring during the asbestos abatement and demolition. Additional issues were raised about the City's IS/MND and the Draft RAP. For this reason, the Commission continued the Planning Commission meeting on this item.

In October 2015, the Draft RAP was released for a 30-day public comment period, which ended November 13, 2015. Based on review of the public comments, the Regional Water Board issued a letter of conditional concurrence addressing the Draft RAP in February 2016. The letter of conditional concurrence indicates the Regional Water Board's general satisfaction with the Draft RAP, subject to incorporation of specific changes regarding fugitive dust, air monitoring, asbestos and lead, and post-excavation soil sampling. The Final RAP will be considered for approval by the Regional Water Board once those changes have been made and this Revised IS/MND has received City approval.

Additionally, in October 2015, Thompson Development, LLC (the project applicant) held a Community Forum to discuss the proposed soil remediation plan and the past abatement and demolition of the gas station. Representatives from the City of Novato Planning Division, Regional Water Board, Urban Planning Partners (consultant to the City of Novato), Novato Unified School District, Novato Charter School, Lanham Village Homeowners Association, and West Yost (environmental remediation consultant to Thompson Development) attended. Feedback received during this meeting was considered in the revisions to the IS/MND described below.

Revisions to the IS/MND

The Revised IS/MND includes updated information from the Draft RAP and updated environmental analyses within the following topic areas:

Air Quality

- The air quality model was re-run to extend the construction period to include the additional time for the RAP work and maximum off-haul soil amount and the approximately six days of demolition work that occurred in April of 2015. In order to provide a conservative assessment of project impacts, the air quality analysis also considers average daily emissions for the RAP work only, since it is possible that RAP work could be conducted alone without implementation of the full project.
- Bay Area Air Quality Management District (BAAQMD) Additional Construction Mitigation Measures for fugitive dust control were added to Mitigation Measure AIR-1.
- Mitigation Measure AIR-2 was added to reduce the exposure of existing sensitive receptors (nearby residents and schoolchildren) to pollutants from project construction to a less-than-significant level, as described in Table 1.
- Cumulative construction impacts are analyzed.

Hazards

- More recent (2013) groundwater sample information was added.
- Remediation activities from the Soil Management Plan (SMP) and Sampling Analysis Plan (SAP) were updated.
- The City opted to develop mitigation measures that are consistent with and in some instances exceed the requirements of the RAP to maximize oversight for the remediation activities and improve the margins of safety for the general public, including nearby sensitive receptors. Therefore, Mitigation Measure HAZ-1 was updated to include a seven-part mitigation measure detailed in Table 1 below:
- Cumulative construction impacts are analyzed.

Hydrology and Water Quality

- Additional measures to protect stormwater quality during site remediation from the RAP and SMP are described in more detail in the Discussion section.

Noise

- Additional truck trips for soil export and import during remedial activities are considered; however, the minor increase would not affect the original IS/MND findings, particularly considering they would be temporary and for a short duration.

Transportation and Traffic

- Additional truck trips for soil export and import during remedial activities are considered; however, the minor increase would not affect the original IS/MND findings, particularly considering they would be temporary and for a short duration.
- The truck route for soil export and import during remedial and construction activities is specified.

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
I. AESTHETICS				
The project may create a new source of substantial light or glare.	S	Mitigation Measure AES-1: Prior to issuance of a building permit, the applicant shall submit an exterior lighting plan including fixture and standard design, coverage and intensity, which provides that any outdoor night lighting proposed for the project is directed downward and shielded to prevent light spill onto surrounding properties, sky glow, and glare. The plan shall conform to the performance standards provided under Section 19.38.090 of the Zoning Code and shall be subject to the review and approval of the City review authority.	LTS	14
II. AIR QUALITY				
Fugitive dust emissions generated during project construction may result in significant air quality impacts.	S	Mitigation Measure AIR-1: The project applicant shall institute a dust control program during the construction phase of the project (see *Section VIII, Hazards* for additional dust control measures during remediation activities). Elements of the dust control program shall include, but not necessarily be limited to, the following: • An inventory of construction equipment and schedule for equipment use shall be submitted to the City of Novato before issuance of demolition and/or grading permits. See Mitigation Measure AIR-2 for further requirements. • All exposed surfaces (i.e., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered using recycled water as necessary to control dust. • All haul trucks transporting soil, sand, or other loose material off-site shall be covered and anchored to prevent exposure.	LTS	22

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
		• All visible mud or dirt tracked out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day or more frequently should mud or dirt be visible on adjacent roads. The use of dry power sweeping shall be prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 miles per hour. • All paving shall be completed as soon as possible. All exposed soil shall be stabilized (e.g. hydroseeding or soil binders) until the building pad is laid. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with the manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. • A publicly visible sign shall be posted with the name and telephone number of the person representing the project sponsor to contact regarding dust complaints. This person shall respond and take corrective action within one (1) hour of receiving a complaint. The Bay Area Air Quality Management District (BAAQMD) and City of Novato phone number shall also be visible to ensure compliance with applicable regulations.		

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
		Additional Construction Mitigation Measures • All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe. Water for dust control will be monitored to ensure an application rate that prevents runoff to off-site locations, discharge to storm drain, or any nearby water features (e.g., Pacheco Creek). • Stockpiled soil, if any, will be covered with plastic sheeting, or other similar material, at the end of each workday. A stockpile that is known to be inactive shall be immediately covered with plastic sheeting or a similar material. A stockpile that is not being actively worked on for more than 60 minutes will be covered with plastic sheeting or a similar material to prevent dust from leaving the Site. • All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. • Wind breaks (e.g., fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity. • Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted immediately in areas with exposed soil and no further soil disturbance is anticipated and watered appropriately until vegetation is established. • The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time. • All trucks and equipment, including their tires, shall be		

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Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
		washed off prior to leaving the site. • Site accesses from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel. • Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent (see Mitigation Measure HYD-1 regarding the implementation of a Stormwater Pollution Prevention Plan (SWPPP) and Stormwater Control Plan).		
The project could expose sensitive receptors to substantial pollutant concentrations.	S	Mitigation Measure AIR-2: The applicant shall develop a plan for the project demonstrating that the off-road equipment to be used on-site to construct the project would achieve a fleet-wide average 45 percent reduction in $PM_{2.5}$ exhaust emissions or more. One feasible plan to achieve this reduction would include the following: • All mobile diesel-powered off-road equipment larger than 50 horsepower and operating on the site for more than two days shall meet, at a minimum, U.S. EPA particulate matter emissions standards for Tier 2 engines or equivalent; and • All diesel-powered portable equipment (i.e., aerial lifts, air compressors, concrete saws, forklifts, and generators) operating on the site for more than two days shall meet U.S. EPA particulate matter emissions standards for Tier 4 engines or equivalent. Note that the construction contractor could use other measures to minimize construction period DPM emission to reduce the predicted cancer risk below the thresholds. The use of equipment that includes CARB-certified Level 3 Diesel Particulate Filters or alternatively-fueled equipment (i.e., non-diesel) would meet this	LTS	30

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
		requirement. Other measures may be the use of added exhaust devices, or a combination of measures, provided that these measures are approved by the City and demonstrated to reduce community risk impacts to a less-than-significant level. Also with implementation of Mitigation Measure AIR-1 and Mitigation Measures HAZ-1a through HAZ-1g		
The project may result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.	S	See Mitigation Measure AIR-1 and Mitigation Measures HAZ-1a through HAZ-1g	LTS	22; 65
V. CULTURAL RESOURCES				
The project could cause a substantial adverse change in the significance of an archaeological resource.	S	<u>Mitigation Measure CULT-1</u>: In keeping with the CEQA guidelines, if archaeological remains are uncovered, work at the place of discovery should be halted immediately until a qualified archaeologist can evaluate the finds (§15064.5 [f]). Prehistoric archaeological site indicators include: obsidian and chert flakes and chipped stone tools; grinding and mashing implements (e.g., slabs and handstones, and mortars and pestles); bedrock outcrops and boulders with mortar cups; and locally darkened midden soils. Midden soils may contain a combination of any of the previously listed items with the possible addition of bone and shell remains, and fire affected stones. Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits	LTS	40

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

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		(e.g., wells, privy pits, dumps). Mitigation Measure CULT-2: The following actions are promulgated in Public Resources Code 5097.98 and Health and Human Safety Code 7050.5, and pertain to the discovery of human remains. If human remains are encountered, excavation or disturbance of the location must be halted in the vicinity of the find, and the county coroner contacted. If the coroner determines the remains are Native American, the coroner will contact the Native American Heritage Commission. The Native American Heritage Commission will identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent makes recommendations regarding the treatment of the remains with appropriate dignity.		
The project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	S	Mitigation Measure CULT-3: If paleontological resources are encountered during project construction activities, all soil-disturbing activity within 100 feet of the find shall be temporarily halted until a qualified paleontologist can assess the significance of the find and provide proper management recommendations. The City shall review and incorporate the management recommendations into the project as feasible.	LTS	41
The project could directly or indirectly disturb human remains, including those interred outside of formal cemeteries.	S	See Mitigation Measure CULT-2	LTS	40
VI. GEOLOGY AND SOILS				
The project could expose people or structures to potential substantial	S	Mitigation Measure GEO-1: Prior to the issuance of any grading or construction permits, a design-level geotechnical investigation	LTS	45

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

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adverse effects, including the risk of loss, injury, or death involving strong seismic shaking.		shall be prepared by a licensed professional and submitted to the City Engineer for review and approval. The investigation shall verify that the project plans comply with CBC and City requirements and incorporate the recommendations for design contained in the 2007 geotechnical report for the project site. All design measures, recommendations, design criteria, and specifications set forth in the design-level geotechnical investigation shall be implemented as a condition of project approval.		
The project could expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic related liquefaction.	S	See Mitigation Measure GEO-1	LTS	45
Grading and earthmoving during remedial activities and project construction has the potential to result in erosion and loss of topsoil.	S	Mitigation Measure GEO-2: As a condition of approval of grading and construction permits, the applicant shall demonstrate compliance with Novato Grading Permit requirements, including Chapters 5-23, 6 and 19-20.050 of the Novato Municipal Code. This shall include a description of required silt, mud, and siltation control measures that will be implemented during construction and necessary erosion control measures on any cut and fill slopes following construction. Also with implementation of Mitigation Measure HYD-1	LTS	47; 80
Liquefaction and/or seismic-induced ground settlement could occur at the site.	S	See Mitigation Measure GEO-1	LTS	45
VIII. HAZARDS				
Remedial activities could result in a	S	Mitigation Measure HAZ-1: The following seven-part mitigation	LTS	65

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significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.		measures would reduce potential impacts of routine hazardous materials transportation, use, or disposal during remedial activities at the project site to a less-than-significant level: HAZ-1a: Prior to the City issuing any permits for remediation activity at the site, the applicant shall provide the City with written documentation from the Regional Water Board and/or DTSC that the RAP, including a final SMP and SAP, has been approved. HAZ-1b: Prior to the City issuing any permits for remediation activities at the site, the City shall contract with an independent, qualified environmental monitor, at the applicant's expense, to prepare a comprehensive safety and monitoring program and to be present at the site during all remedial activities. The environmental monitor shall prepare a safety and monitoring plan and conduct remediation monitoring which meets the following minimum requirements, subject to the review and approval by the Regional Water Board, DTSC, and the City of Novato: a. The monitor will develop a comprehensive monitoring plan detailing actions required during remediation to protect off-site receptors from contaminants potentially released during excavation and other earthmoving activities. At a minimum, the safety and monitoring plan shall address: 1. The installation and maintenance of pre-remediation safety measures, including, but not limited to, placing plastic sheeting or other acceptable barriers over outdoor eating surfaces, play equipment and		

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		vegetable beds at the North Bay Children's Center, Novato Charter School, Wonder Nook Preschool, the community garden at Lanham Village, and Hamilton Elementary School prior to the start of each weekend work session; 2. Monitoring of the third party dust control subcontractor (Mitigation Measure HAZ-1d) to insure implementation, at a minimum, of the dust and odor control measures specified in Mitigation Measure AIR-1 and the measures specified in the RAP (see SMP - Section 6.4.1) during any remediation activities (weekends only; see HAZ-1c below) and over the weekdays between remediation work periods. The third party dust control subcontractor shall also ensure: a) water for dust control is monitored to ensure an application rate that prevents runoff to off-site locations, discharge to storm drain, or any nearby water features (e.g., Pacheco Creek); and b) tarps are placed over all excavation pits after the completion of each day's remediation activities. 3. Implementation of the groundwater control and disposal and storm water pollution prevention protocols specified in the RAP (see SMP Sections 6.4.6 and 6.4.7) and Mitigation Measure HYD-1 (discussed below) during the remedial phase. 4. Specifications for the application of non-toxic VOC vapor suppressants during soil excavation and hauling, including application to excavation sidewalls		

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

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		and pits during non-construction hours. 5. The establishment and implementation of perimeter air monitoring protocols for lead and other heavy metals, asbestos, particulate matter, and organic vapor consistent with monitoring provisions specified in the RAP (see SMP Section 6.4.2), including the addition of the following supplemental provisions: i) Upwind and downwind sampling stations along the site perimeter that shall be active during all remedial earthmoving work and require results to be compared daily to background levels (measured prior to construction as part of the monitoring plan) to evaluate the effectiveness of the engineering and dust control measures implemented during remedial activities; ii) Monitoring equipment shall include an anemometer and wind vane to establish wind speed and direction, real-time particulate monitors (Met One E-BAM or equivalent), lead and asbestos air samplers (BGI PQ100 or equivalent), real-time photoionization organic vapor detectors (RAE UltraRAE 3000 or equivalent), and an X-ray fluorescence (XRF) analyzer to determine the presence of heavy metal contaminants in air particulate samples. iii) Particulate matter and organic vapor shall be monitored in real time, while two perimeter heavy metals (Title 22 list) and asbestos samples shall		

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		be collected during each day's remedial activities using methodology designed to represent the worst-case exposures for that work day. The heavy metals and asbestos samples shall be analyzed using the quickest available laboratory turnaround time. 6. The environmental monitor shall make provisions to maintain an inventory of back-up monitoring and testing equipment at the project site during remedial activities. Should monitoring equipment fail and a replacement device(s) is not immediately available then all remedial work shall be stopped pending replacement of the monitoring equipment. 7. The establishment of perimeter action levels for lead, asbestos, heavy metals, particulate matter, and organic vapor to be protective of human health and the environment, based on established health and safety standards. The following minimum action levels shall be included in the monitoring plan: i) For lead and particulate matter, action levels shall be the strictest ambient air standard from U.S. EPA or the BAAQMD: 0.15 µg/m3 for lead and 20 µg/m3 for particulate matter (as PM10) measured at downwind locations. With the exception of lead, no ambient air quality standards have been established for heavy metals. Accordingly, any exceedance of perimeter heavy metals concentrations above background levels		

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Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
		(measured before remedial activities at the upwind and downwind perimeter locations specified in the environmental monitoring plan) shall also represent an exceedance under the monitoring plan. ii) No ambient air quality standards have been established for asbestos. Accordingly, any exceedance of perimeter asbestos above background levels (measured before remedial activities at the upwind and downwind perimeter locations specified in the environmental monitoring plan) shall represent an exceedance under the monitoring plan. iii) No ambient air quality standards have been established for organic vapor. Accordingly, any exceedance of perimeter organic vapor above background levels (measured before remedial activities) measured at downwind locations shall represent an exceedance under the monitoring plan. 8. The assignment of specific corrective measures/procedures to be implemented if a perimeter action level is exceeded during remedial activities. If a perimeter action level is exceeded, the environmental monitor shall stop all work, assess the problem, and direct corrective action(s). Corrective actions may include, but are not limited to: increasing the frequency of dust control measures, modifying		

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Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
		dust control procedures, changing soil removal procedures, and/or directing the use of alternate construction equipment or methods. The environmental monitor shall recheck perimeter air monitoring levels to determine if the selected corrective actions have been effective. 9. The development of emergency response protocols to be implemented should there be an accidental release of contaminated soil and/or groundwater or a dust control problem, that in the opinion of the environmental monitor, City, Regional Water Board, or DTSC, represents an immediate threat to the public or causing contamination of an off-site location warranting the immediate notification of representatives of Lanham Village, the Director of the Novato Charter School, the Director of the North Bay Children's Center, the Superintendent of the Novato Unified School District, and the City's Community Development Director. The emergency response protocols must specify the channels of communication through which notification and safety guidance will be delivered and establish directives for each organization to advise their respective stakeholders (e.g., parents, residents) of the emergency situation. 10. The development and implementation of post-remediation work hygiene protocols, including, but not limited to, the proper removal of plastic sheeting or other barriers placed over outdoor eating surfaces,		

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
		play equipment, and vegetable beds at the North Bay Children's Center, Novato Charter School, Wonder Nook Preschool, the community garden at Lanham Village, and Hamilton Elementary School and the wiping down of all outdoor eating surfaces and play equipment at the noted children's facilities. The post-remediation hygiene protocol shall be conducted at the close of each weekend work period. 11. The establishment of procedures addressing the notification and identification of unknown environmental features (e.g., stained or odorous soil, tanks, etc.). At a minimum, the monitoring plan shall incorporate such procedures from the RAP with the added conditions of requiring notification of the City of Novato, Regional Water Board, and any other agency with potential jurisdiction over the environmental feature. b. The environmental monitor shall be present during all remediation work to ensure all components of the safety and monitoring plan and final RAP are implemented and maintained throughout the remediation phase. At a minimum, the environmental monitor shall perform the following activities: 1. The environmental monitor shall be responsible for reporting directly to the City and shall have the authority to: a) direct the start of each remediation work day after confirming implementation of all pre-remediation safety measures; b) direct corrective		

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
		action to maintain compliance with the monitoring plan; c) stop work at the project site for any violation of the monitoring plan protocols or an exceedance of the perimeter contaminant threshold(s) established in the monitoring plan; and d) monitor and confirm compliance with post-remediation work hygiene procedures and release of remediation personnel once such work is deemed complete. The applicant and its remediation contractor/subcontractors shall acknowledge and agree in writing that the environmental monitor has such authorities and will not be obstructed from exercising oversight and direction relating to the monitoring of the remediation phase. 2. The environmental monitor shall maintain a log of the events of each remediation workday, including the results of air monitoring readings as required by the SMP (see SMP Section 6.4.5) and provide a report to the Community Development Director, the Regional Water Board, and Department of Toxic Substances Control regarding compliance with the monitoring plan and testing results. 3. The environmental monitor shall observe and ensure the proper removal and disposal of any floor tiles or remnants thereof affixed to or visible in the vicinity of the foundation slab of the former gas station at the project site. The removal and disposal shall be conducted in accordance with Cal/OSHA Construction Safety Orders for Lead (Title 8, California Code of		

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		Regulations, Section 1532.1). The removal process shall be completed prior to the initiation of other remedial activities at the project site to avoid pulverizing the tile. HAZ-1c: Excavation, grading, loading, and off-hauling of any contaminated soils during the remediation phase of the project or any subsequent remedial activities shall only be conducted on Saturdays and Sundays when children are not present at the North Bay Children's Center, Novato Charter School, Wonder Nook Preschool, and Hamilton Elementary School. The acceptable hours of operation for such weekend work shall be 10 a.m. to 5 p.m. with permission to perform remediation activities on Sundays granted by the Community Development Director pursuant to Novato Municipal Code Section 19.22.070, as discussed in the Noise Section of the IS/MND. HAZ-1d: The applicant shall contract with a third-party dust control subcontractor whose sole responsibility is to implement the dust control procedures specified in Mitigation Measure AIR-1 and the RAP. The dust control subcontractor shall ensure adequate equipment and water supplies are available prior to the start of work and at all times during the remediation phase to properly suppress dust. The dust control subcontractor shall be subject to oversight by the environmental monitor (Mitigation Measure Haz-1b) who has authority to direct corrective actions to ensure proper dust suppression. Such authority shall be confirmed in the contract between the applicant and said		

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Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
		dust control contractor. HAZ-1e: A public notice shall be mailed by the City on behalf of the applicant to all property owners of record within a 1,000-foot radius of the project site and operators of all facilities serving children within this radius announcing the date of initiation of remediation activities. Said notice shall include contact information for the environmental monitor required by Mitigation Measure Haz-1b. The notice shall also list contact numbers of representatives of the applicant, the remediation contractor, the City of Novato, the BAAQMD, the Regional Water Board, and DTSC. Said notice shall be mailed no less than thirty (30) calendar days before the scheduled initiation of remediation activities. HAZ-1f: The applicant shall post signs at the project site, North Bay Children's Center, Hamilton Elementary School, Novato Charter School, Wonder Nook Preschool, the community garden at Lanham Village, and the South Novato Library advising of the dates that remediation work will occur and listing contact information for: the applicant's representative, the City of Novato, the BAAQMD, the Regional Water Board, DTSC, and the project's environmental monitor. The text of the signs shall be submitted to the Community Development Director for review and approval. Signs shall be posted no less than thirty (30) calendar days prior to the scheduled initiation of remediation activities and shall remain in place throughout the remediation phase. HAZ-1g: The applicant shall conduct a post-remediation human health risk assessment (HHRA) as specified in the RAP		

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
		to evaluate the post-remediation concentrations of soil, groundwater, and soil vapor contaminants at the site, including testing of any locations where soils not removed during remediation activities were previously found to contain contaminant concentrations above Regional Water Board Environmental Screening Levels for residential land uses. The HHRA shall be reviewed by the DTSC.		
The project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	S	Mitigation Measure HAZ-2: Prior to the City considering approval of the proposed amendments to the General Plan, Master (Reuse) Plan, or Zoning that would allow residential uses, the applicant shall provide the City with the Certificate of Completion for the RAP for the site, issued by the Regional Water Board and/or DTSC and the Notice of Release or other appropriate instrument on the deed restriction as issued by the Department of the Navy that shows the deed restriction has been removed. Also with implementation of Mitigation Measure HAZ-1a through HAZ-1g	LTS	71; 65
Remedial activities could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	S	See Mitigation Measure HAZ-1a through HAZ-1g	LTS	65
The project is listed on government hazardous material site databases due to releases from the former USTs at the project site.	S	See Mitigation Measure HAZ-1a through HAZ-1g and Mitigation Measure HAZ-2	LTS	65; 71

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
IX. HYDROLOGY AND WATER QUALITY				
Remediation, construction, or operation of the project could result in violation of water quality standards.	S	Mitigation Measure HYD-1: As a condition of approval for grading and construction permits for the project site, the applicant shall demonstrate compliance with current requirements of the Construction General Permit and MS4 Permit including preparation of a Stormwater Pollution Prevention Plan (SWPPP) and a Stormwater Control Plan (SCP). The SWPPP shall be installed and maintained throughout the duration of remediation activities, during the interim period between the remediation and construction phases, and through the entirety of the construction phase of the project. Also with implementation of Mitigation Measure HAZ-1a and HAZ-1b	LTS	80; 65
Remediation, construction, or operation of the project could degrade water quality.	S	See Mitigation Measures GEO-2, HAZ-1b, and HYD-1	LTS	47; 65; 80
The project is located in a 100-year flood hazard area and could pose flooding hazards to future residents.	S	Mitigation Measure HYD-2: Prior to issuance of any construction permits for the project, the applicant shall submit documentation to the City Engineer to demonstrate that the proposed project complies with all elements of Novato Municipal Code Chapter 5-31 for housing proposed within the 100-year flood zone.	LTS	82
X. LAND USE				
The project could conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project.	S	Mitigation Measure LAND-1: Prior to the City considering approval of the proposed amendments to the General Plan, Master Plan (Reuse Plan), or Zoning that would allow residential uses, the applicant shall provide the City with the Certificate of	LTS	85

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
		Completion for the RAP for the site, issued by the Regional Water Board and/or DTSC and the Notice of Release or other appropriate instrument on the deed restriction as issued by the Department of the Navy that shows the deed restriction has been removed.		
XII. NOISE AND VIBRATION				
Interior noise levels could exceed the maximum allowable interior sound level of 45 dBA L_{dn}	S	Mitigation Measure NOI-1: Provide a suitable form of forced-air mechanical ventilation, as determined by the City Engineer, for residential units throughout the site, so that windows could be kept closed at the occupant's discretion to control noise and achieve the 45 dBA L_{dn} interior noise standard.	LTS	95
Noise generated by project construction could result in substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	S	Mitigation Measure NOI-2: Construction equipment shall be well maintained and used judiciously to be as quiet as practical. The following measures, when applicable, shall be followed to reduce noise from construction activities and shall be the responsibility of the project applicant: Equip all internal combustion engine-driven equipment with mufflers, which are in good condition and appropriate for the equipment. Use "quiet" models of air compressors and other stationary noise sources where technology exists. Locate stationary noise-generating equipment and construction staging areas as far as feasible from sensitive receptors when sensitive receptors adjoin or are near a construction area. Prohibit unnecessary idling of internal combustion engines.	LTS	98

TABLE 1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure	Revised IS/MND Page Reference
		Designate a "construction liaison" that would be responsible for responding to any local complaints about construction noise. The liaison would determine the cause of the noise complaints (e.g., starting too early, bad muffler, etc.) and institute reasonable measures to correct the problem. Conspicuously post a telephone number for the liaison and the City of Novato at the construction site. Hold a pre-construction meeting with the job inspectors and the general contractor/on-site project manager to confirm that noise mitigation and practices (including construction hours, construction schedule, and noise coordinator) are completed.		
XVII. UTILITIES AND SERVICE SYSTEMS				
The project could result in inadequate capacity to serve the project's projected wastewater demand.	S	Mitigation Measure UTL-1: Prior to issuance or a grading or other building permit, the applicant shall submit improvement plans to the City for review and approval to increase the capacity of the sewer main to adequately serve the project site.	LTS	119

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PROJECT DESCRIPTION

1. **Project Title:** Main Gate Road and "C" Street Project

2. **Lead Agency Name and Address:**
   City of Novato
   Planning Division
   922 Machin Avenue.
   Novato, CA 94945

3. **Contact Person and Phone Number:**
   Stephen Marshall, AICP
   Planning Manager
   smarshall@novato.org
   (415) 899-8942

   Carla Violet
   Contract Planner
   cviolet@up-partners.com
   (510) 251-8210

4. **Project Location:**
   The project site is located at 970 C Street - the Northwest Corner of Main Gate Road and "C" Street in the City of Novato, Marin County.

5. **Project Sponsor's Name and Address:**
   Casey Clement, Development Manager
   Thompson Development, Inc.
   250 Bel Marin Keys Boulevard, Building A
   Novato, CA 94949

6. **General Plan Designation:**
   Neighborhood Commercial (CN)

7. **Zoning:**
   Planned District (PD); Hamilton Army Airfield Reuse Plan

8. **Description of Project:**
   The following project description details the location of the project site, surrounding land uses, project components, and background about the regulatory requirements to complete the project as proposed.

Project Site

The project site lies on the southeast side of the City of Novato, just east of Highway 101 and within the former Hamilton Air Force Base as shown in Figure 1.

The project site is comprised of approximately 2.7 acres (Assessor's Parcel Number 157-980-05) on the northwest corner of Main Gate Road and "C" Street and is currently unoccupied. The site is generally level. It was previously developed with a gas station. The project site is surrounded by a chain-link fence and is paved with sparse vegetation growing in the cracks, including some grass and weeds. A culverted creek (Pacheco Creek) runs along the western border of the project site.

The project site has frontage along Main Gate Road on the south and frontage along "C" Street on the east. Immediately north is vacant Novato Unified School District property and immediately west is Lanham Village (residential condominiums) and Wonder Nook Preschool. Farther east across "C" Street are educational uses, including North Bay Children's Center, Novato Charter School, and two vacant lots owned by Novato Unified School District. Figure 2 shows the Architectural Site Plan prepared by Opticos Design, Inc. dated June 11, 2014.

Project Components

The proposed project includes two key components: (1) site remediation and (2) site development.

The remediation component will include excavation of soil impacted by the release of hazardous materials, post-excavation soil sampling, backfilling of clean soil, and replacement of three active monitoring wells as described in the Draft Remedial Action Plan (Draft RAP), Soil Management Plan (SMP), and Sampling Analysis Plan (SAP) (West Yost Associates, 2015) and included in Appendix B.

Following the remediation process, the site would be developed with 31 townhome-style residential units with tuck-under parking in 8 three-story buildings and 1 two-story building. A rear and internal alleyway would provide vehicle access to tuck-under parking for each unit. The maximum building height is approximately 34 feet and a rear alleyway surrounds the project. There are 6 three-story buildings that surround and face a common park space, 2 three-story buildings with frontage on "C" Street, and 1 two-story building with frontage on Main Gate Road. There would be a fence along the perimeter of the rear alleyway to screen tuck-under parking garages and a low wall on Main Gate Road and "C" Street to partially screen units facing the street.

The proposed project includes the elements listed below and detailed in Table 2.

FIGURE 1 PROJECT SITE AND VICINITY

FIGURE 2 ARCHITECTURAL SITE PLAN

TABLE 2 PROJECT COMPONENTS

Use	Amount
Residential, by Type	*Units*
Three-Bedroom	21
Four-Bedroom	10
Total	**31**
Common Spaces/Community Amenities	*Square Feet*
Hamilton Square	10,270
Mail Pavilion Plaza	2,720
Entry Green at Main Gate Road	1,720
Total	**14,710**
Residential Parking	*Spaces*
Off-street Enclosed	62
Off-street Open	17
Total	**79**

Source: Opticos Design, Inc., Architectural Plans, dated June 11, 2014.

- **Residential Units**: A total of 31 units are proposed. The types of units include 21 three-bedroom and 10 four-bedroom townhomes. Unit sizes range from 1,387 to 1,929 square feet.
- **Common Spaces and Amenities**: The proposed townhome project includes a large central common park space (Hamilton Square) for social gatherings and recreation among residents. Directly south of the park is a small plaza with a mail pavilion and an entry green that abuts the sidewalk on Main Gate Road. Additional front yards, upper-story balconies, and landscaped areas throughout the project site are also provided.
- **Circulation and Parking**: There are a total of three vehicular entry points proposed to connect an internal alley network within the project site. Two access points are located on "C" Street, leading to an alley that provides access to tuck-under parking for the three buildings facing the street and the two buildings that wrap around the east end of the park. The third vehicular access point is located on Main Gate Road, leading to an alley that wraps around the perimeter of the project site. Each unit is provided with two tuck-under parking spaces. There are 17 additional parking spaces along the internal alleyways (a minimum of 10 guest spaces are required).

BACKGROUND

Deed Restriction and Covenant Agreement

On April 18, 2005, the Department of the Navy (Grantor) transferred the project site (Hamilton Square Parcel) to Hamilton Square, LLC (Grantee) with certain deed restrictions on the use of the project site to protect present and future human health and safety as a result of the presence of hazardous materials on portions of the project site. The deed states that "the Property [project site] is subject to the provisions of a certain covenant to restrict use of property and environmental restriction for parcels 28, 29, and 30 (also referred to as Exchange Triangle Parcel 1—"Sale Area") at Department of Defense Housing Facility, Novato (the "Covenant Agreement") by and between the Grantor, as Covenantor, and the State of California acting by and through the Department of Toxic Substances Control (DTSC) and the San Francisco Bay Regional Water Quality Control Board (Regional Water Board), as Covenantees". Although the Land Use Covenant prohibits the property from being redeveloped for residential purposes, the deed states that "the Grantee may request approval for, and the Grantor may at its discretion provide, a variance or termination of the Prohibited Uses". The Grantee's request would only be made after the Grantee had applied for and obtained written approval from DTSC and the Regional Water Board for a variance or termination of the Prohibited Uses.

The applicant submitted the Draft Remedial Action Plan (Draft RAP) to DTSC and the Regional Water Board in November 2014, April 2015, August 2015, and October 2015 (West Yost Associates, 2015) with revisions submitted. The Draft RAP proposes to improve site subsurface soil and groundwater conditions to meet residential human health standards in preparation for redevelopment. Once the Draft RAP is approved, the remediation is complete, and it has been demonstrated, per the requirements of DTSC and the Regional Water Board, that the site is suitable for residential use, the applicant would apply to DTSC and the Regional Water Board for their consent to release the covenant to permit residential uses on the project site. If consent of the DTSC and the Regional Water Board as Covenantees is approved, the applicant would thereafter request from the Department of the Navy a release of the deed restriction by Notice of Release or other appropriate instrument.

General Plan, Hamilton Reuse Plan, and Zoning Designations

In order to proceed with the project as proposed, the applicant is requesting amendments to the City of Novato General Plan (General Plan), the Hamilton Army Airfield Reuse Plan (specifically the Main Gate Road and "C" Street parcel located in the Exchange Triangle), and the existing Precise Development Plan for the site.

General Plan

The General Plan designates the project site as Neighborhood Commercial (CN) which is inconsistent with the proposed use of multi-family residential. In light of this inconsistency, the project includes a request for a General Plan Amendment to change the land use designation to Medium Density Multiple Family Residential (R10) to accommodate the proposed project. The R10 land use designation permits a variety of residential uses, including multiple-family dwellings, two-family dwellings, detached or attached single-family dwellings, recreation, home occupations, community facilities, and other similar uses. The R10 land use designation has an allowable density range of 10.1 to 20.0 dwelling units per acre. As currently proposed, the density of the project is approximately 12 dwelling units per acre. Approval of the requested release of the deed restriction noted earlier is a necessary prerequisite to the General Plan amendment for the proposed project.

Zoning Designation, Master Plan and Precise Development Plan

The current zoning for the project site is PD, Planned District. Projects located in the PD zoning district require approval of a Master Plan and a Precise Development Plan.

The Hamilton Army Airfield Reuse Plan was adopted as the Master Plan for a portion of Hamilton Field by the Novato City Council in November 1999 through the adoption of Ordinance No. 1419 and serves as the master plan for the proposed project site. The Master (Reuse) Plan currently declares the zoning for the site as Neighborhood Commercial (CN) which is consistent with the current General Plan land use designation.

The Master (Reuse) Plan splits the 1,672.3-acre Reuse Plan area into 10 Planning Areas, a Runway Parcel and the New Hamilton Partnership Master Plan area. The proposed project is located in the Exchange Triangle Planning Area on the eastern edge of the Hamilton Field complex (Planning Area 5). Language in Planning Area 5 for the Exchange Triangle restricts building heights to 30 feet.

In order to proceed with the project as proposed, the applicant needs to apply for two site specific amendments to the Master (Reuse) Plan that would apply only to the Main Gate Road and "C" Street parcel: (1) change the zoning from CN to R10; (2) amend the text of the Master (Reuse) Plan to allow two exceptions on the project site related to building height including: (a) allow an increase in building heights from two to three stories; and (b) allow an increase in maximum height from 30 to 34 feet.

In addition, in order to allow a residential use at this location, the existing Precise Development Plan must also be amended. The existing Precise Development Plan for the project site, approved in 2007 was for an office project. The current proposed project includes amending the Precise Development Plan to permit residential use, establish specific development standards for the proposed project, and to allow an increase in building height from two to three stories and an increase in the maximum height from 30 to 34 feet.

These requests will be reviewed by the Planning Commission and a recommendation will be forwarded to the City Council which has final decision-making authority over the General Plan, Master (Reuse) Plan, and Precise Development Plan amendments. Approval of the requested release of the deed restriction discussed above is a necessary prerequisite to the General the noted development entitlements for the proposed project.

9. Surrounding Land Uses and Setting:

The Exchange Triangle Planning Area is characterized by vacant parcels and sites that have been recently developed, including the North Bay Children's Center and Novato Charter School (both one story in height) to the east of "C" Street. The vacant parcel abutting the project site to the north is owned by Novato Unified School District. To the south of the project site is Meadow Park, a master-planned community featuring 700 affordable units which include one- and two-story townhomes. Farther southwest of the project site is Hamilton Elementary School (one story in height). Directly west of the project site is Lanham Village, a 154-unit townhome complex featuring two-story residential units and single-story carports and Wonder Nook Preschool. The project site is south of the Commissary Triangle Planning Area, which contains a mix of underdeveloped parcels and sites that have been recently developed, including the Next Key Center and a two-story, 32-room transitional housing facility.

Highway 101, west of the project site runs north/south. The on-ramp from the Alameda Del Prado exit and off-ramp from the Hamilton Field/Nave Drive exit provide the closest freeway access points to the proposed project and are located south and west of the site.

The project site is served by public transit with four Marin Transit bus routes and two Golden Gate Transit routes that stop within approximately 1,200 feet of the site, including commute Bus Route 58 to downtown San Francisco. Other existing routes provide access to destinations within Novato and nearby cities of San Anselmo and San Rafael. A future Sonoma-Marin Area Rail Transit (SMART) rail station is located less than 0.25 miles east of the project site which will provide additional public transit access between the two counties.

10. Requested Applications:

Lead Agency	Permit/Approval
City of Novato	Amendment to the General Plan Amendment to the Master (Reuse) Plan Amendment to the Precise Development Plan Tentative Map Use Permit (Grading/Excavation for Site Remediation) Design Review
Responsible Agencies	
DTSC	Regional Water Board
United States Department of the Navy	

11. Other public agencies whose approval may be required (e.g., permits, financing approval, or participation agreement):

North Marin Water District
Novato Fire Protection District
Novato Sanitary District
Marin County Flood Control and Water Conservation District
San Francisco Bay Regional Water Quality Control Board
California Department of Toxic Substances Control

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- ☐ Aesthetics
- ☐ Biological Resources
- ☐ Greenhouse Gas Emissions
- ☐ Land Use/Planning
- ☐ Population/Housing
- ☐ Transportation/Traffic
- ☐ Agriculture and Forestry Resources
- ☐ Cultural Resources
- ☐ Hazards & Hazardous Materials
- ☐ Mineral Resources
- ☐ Public Services
- ☐ Utilities/Service Systems
- ☐ Air Quality
- ☐ Geology/Soils
- ☐ Hydrology/Water Quality
- ☐ Noise
- ☐ Recreation
- ☐ Mandatory Findings of Significance
- ■ None with Mitigation

Determination. (To be completed by the Lead Agency.) On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

■ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Stephen Marshall ______________________ 10-11-16 ____________

Signature Date

Stephen Marshall, Planning Manager

ENVIRONMENTAL CHECKLIST

I. AESTHETICS Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	❒	❒	■	❒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	❒	❒	❒	■
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	❒	❒	■	❒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	❒	■	❒	❒

Affected Environment

The visual landscape surrounding the project site is mostly developed, consisting primarily of residential and institutional uses. The site is surrounded by a mix of two-story residential townhomes, a preschool, a charter school and children's center, and two vacant parcels owned by Novato Unified School District. Farther south from the site across Main Gate Road are one-story townhomes and Hamilton Elementary School. To the east of the project site is Highway 101.

Discussion

a) Have a substantial adverse effect on a scenic vista?

Less Than Significant. The General Plan identifies several ridgelines and other scenic resources, most notably Mt. Burdell, Pinheiro Ridge, Big Rock Ridge, hills east of Highway 101 and south of Hamilton Field, Bay plains, and Bay shorelines. These visual resources provide buffers between residential areas and offer an attractive backdrop for developed areas. The General Plan contains objectives and policies that seek to protect views of these natural assets including:

> EN Objective 7 Protect visual values on hillsides, ridgelines, and other scenic resources.
>
> EN Policy 27 Scenic Resources. Protect visual values on hillsides, ridgelines, and other scenic resources.

Main Gate Road is lined with mature trees (about 20 feet high) and low shrubs that significantly cover the fenced-off project site. If the project is built, views from Main Gate Road across the site would consist of a low wall that wraps around the perimeter of the site, trees, and an entry green which would provide views of the Mail Pavilion plaza and larger park area within the project site. The two-story townhome building would be visible through and above the trees along Main Gate Road. Views from "C" Street across the project site consist of the fenced-off site, telephone poles, and street lights. Views of the hills east of Highway 101 are also visible. Currently there are no trees or landscaping that screen views of the site; however, trees would be planted once the project is built. The three-story townhomes would then be visible through and above trees along "C" Street.

The project is located in an urbanized portion of Hamilton Field and is not highly visible from any nearby scenic vista locations. Moreover, the project would blend in with other two-story, multi-family residential uses nearby the project site. The project would be visible from some private viewpoints on "C" Street, including the North Bay Children's Center and the Novato Charter School; however, the project would not substantially affect views of the hillside to the west because there are already mature trees (ranging from 10 to 20 feet high) along the western edge of the project site which partially block views of neighboring Lanham Village and the hillside. The project would also not significantly affect private views from the next closest residential area to the east of "B" Street because these homes are more than 900 feet away from the project site. From the right of way on "C" Street, views of the hillside would be blocked in front of the project site; however, this isolated area would not result in a substantial loss of a scenic vista from "C" Street. Existing partial public views of the hillside would still be visible from Main Gate Road, the main roadway in the vicinity of the project. Aside from public views along the right of way on "C" Street in front of the project site, no major views of the hills would be affected by the two- and three-story project.

The changes in views resulting from the project would not significantly alter views from public viewpoints, nor would they degrade public views of any ridgelines or other visual resources identified in the General Plan, and therefore, would have a less-than-significant impact on scenic vistas.

b) *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway?*

No Impact. California's Scenic Highway Program serves to protect and enhance California's natural scenic beauty and to protect the social and economic values provided by the State's scenic resources. Highway 101 is the closest highway to the project site; although the site is not visible from Highway 101. Additionally, Highway 101 is not designated as a Scenic Highway, according to California Scenic Highway mapping system (CalTrans, 2014). As a result, the project would not substantially damage scenic resources within a State Scenic Highway and no impact would occur.

c) *Substantially degrade the existing visual character or quality of the site and its surroundings?*

Less Than Significant. The visual character of the project site would substantially change with the introduction of a two- and three-story townhome development, sidewalks, and increased landscaping in place of a vacant lot, but it would not substantially degrade the existing visual character. The existing site is considered an eyesore because it is surrounded by a chain-link fence and appears derelict and abandoned. The proposed development would improve the visual character and appearance of the properties along Main Gate Road and "C" Street with complementary Eclectic Spanish architectural style and no visible parking. The area is undergoing change with several projects that were recently approved, consistent with both the General Plan and Master (Reuse) Plan.

The 2015–2023 Housing Element highlights themes of high-quality compatible design and pedestrian-scaled street frontages, specifically:

> HO Policy 3.2 Design that Fits into the Neighborhood Context. It is the City's intent that neighborhood identity and sense of community will be enhanced by designing all new housing to have a transition of scale and compatibility in form to the surrounding area.
>
> HO Policy 3.3 Housing Design Principles. The intent in the design of new housing is to provide stable, safe, and attractive neighborhoods through high quality architecture, site planning, and amenities that address the following principles:
>
> a) Reduce the perception of building bulk. In multi-unit buildings, encourage designs that break up the perceived bulk and minimize the apparent height and size of new buildings, including, for example, the use of upper story stepbacks and landscaping. Application of exterior finish materials, including siding, trim, windows, doors, and colors, are important elements of building design and an indicator of overall building quality.
>
> b) Recognize existing street patterns. Where appropriate, encourage transitions in height and setbacks from adjacent properties to respect adjacent development character and privacy. Design new housing so that, where appropriate, it relates to the existing street pattern.
>
> c) Enhance the "sense of place" by incorporating focal areas where appropriate.
>
> d) Design new housing around natural and/or designed focal points, emphasized through pedestrian/pathway or other connections.
>
> e) Minimize the visual impact of parking areas and garages. Discourage home designs in which garages dominate the public façade of the home (e.g., encourage driveways and garages to be located to the side or rear of buildings, or recessed, or along rear alleyways or below the building in some higher density developments).

From a bulk and massing perspective, the proposed project's two-story building is reflective of the predominant pattern of development in the project area, which is characterized by two-story structures with single-story elements, including development at Meadow Park and Lanham Village. However, the proposed three-story buildings may be noticeably higher than the surrounding development. Recognizing this circumstance, the project proposes placing the two-story building at the most visible corner of Main Gate Road and "C" Street and stepping up the building heights toward the middle of the site. Moreover, the architectural concepts include massing broken at the eaves and upper story balconies to draw attention to variations in elevation and minimize the mass and bulk of the three-story buildings. These design features also add articulation to the buildings and minimize what otherwise could be a flat and linear building elevation.

Overall, the site plan, building orientation, massing, and front stoops along the sidewalks would create a presence and sense of activity at the street edge that would improve the feeling of a neighborhood identity along Main Gate Road and "C" Street; and create a more active streetscape. The park within the project site is visible from the street which further activates the public sidewalk. The architectural design and finishes are reflective of the Spanish eclectic architecture found throughout Hamilton Field and tuck-under parking is provided for all units accessible by an internal and rear alley to minimize the visual impact of parking.

The project would improve the overall visual character of the existing vacant site and be complementary to surrounding developments. As a result, it would not substantially degrade the existing visual character of the site or its surroundings; thus the potential impact is less than significant.

d) *Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?*

Less Than Significant with Mitigation Incorporated. The site is currently vacant with no on-site lighting. The project would increase the amount of lighting to provide for the comfort, safety, and security of residents and visitors. The project does not yet include a detailed lighting plan. Building materials include windows and some light corrugated metal, but do not include substantial amounts of reflective materials. The following mitigation measure would reduce the potential impact of a substantial light or glare source that would adversely affect views to a less-than-significant level.

> Mitigation Measure AES-1: Prior to issuance of a building permit, the applicant shall submit an exterior lighting plan including fixture and standard design, coverage and intensity, which provides that any outdoor night lighting proposed for the project is directed downward and shielded to prevent light spill onto surrounding properties, sky glow, and glare. The plan shall conform to the performance standards provided under Section 19.38.090 of the Zoning Code and shall be subject to the review and approval of the City review authority.

II. AGRICULTURAL AND FOREST RESOURCES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to a non-agricultural use?	❐	❐	❐	■
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	❐	❐	❐	■
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Governmental Code section 51104(g))?	❐	❐	❐	■
d) Result in the loss of forest land or conversion of forest land to non-forest use?	❐	❐	❐	■
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	❐	❐	❐	■

No Impact. The project site was previously developed as a gasoline and automobile service station and does not include agricultural or forest resources. As a result, the project would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to nonagricultural use, nor would the project result in the loss of forest land or convert forest land to non-forest use. Therefore, the project would not result in impacts related to agricultural and forest resources.

III. AIR QUALITY	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	❒	❒	■	❒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	❒	■	❒	❒
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	❒	■	❒	❒
d) Expose sensitive receptors to substantial pollutant concentrations?	❒	■	❒	❒
e) Create objectionable odors affecting a substantial number of people?	❒	❒	■	❒

Affected Environment

Ambient air quality standards have been established at both the State and federal level. The Bay Area is considered a non-attainment area for ground-level ozone and fine particulate matter ($PM_{2.5}$) under both the Federal Clean Air Act (CAA) and the California CAA. The area is also considered non-attainment for respirable particulates or particulate matter with a diameter of less than 10 micrometers (PM_{10}) under the California CAA. The area has attained both State and federal ambient air quality standards for carbon monoxide.

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NO_x). These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of reducing ground-level ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys, in areas that are downwind of air pollutant sources. High ozone levels aggravate respiratory and cardiovascular diseases, reduce lung function, and increase coughing and chest discomfort.

Particulate matter is another problematic air pollutant in the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}), and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children.

Toxic air contaminants (TACs) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants listed above. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB and are listed as carcinogens either under the State's Proposition 65 or the federal hazardous air pollutants programs.

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of diesel particulate matter (DPM). Several of these regulatory programs affect medium- and heavy-duty diesel trucks that represent the bulk of DPM emissions from California highways. These regulations include the solid waste collection vehicle (SWCV) rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations. In 2008, the CARB approved a new regulation to reduce emissions of DPM and nitrogen oxides from existing on-road heavy-duty diesel-fueled vehicles. The regulation requires affected vehicles to meet specific performance requirements between 2011 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or equivalent by 2023. These requirements are phased in over the compliance period and depend on the model year of the vehicle.

The Bay Area Air Quality Management District (BAAQMD) is the regional agency tasked with managing air quality in the region. CARB (a part of the California Environmental Protection Agency [Cal/EPA]) oversees regional air district activities and regulates air quality at the State level. The BAAQMD CEQA Air Quality Guidelines (BAAQMD, 2011a) were used in this assessment to evaluate air quality impacts of the proposed project.

In June 2010, the BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA. These Thresholds were designed to establish the level at which the BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA and were posted on the BAAQMD's website and included in the Air District's updated CEQA Guidelines (updated May 2011).

The BAAQMD's adoption of the significance thresholds contained in the 2011 CEQA Air Quality Guidelines was challenged in California Building Industry Association (CBIA) v. BAAQMD (Alameda Superior Court Case No. RGI0548693). By an order issued March 5, 2012, the BAAQMD was required to set aside its approval of the thresholds until it conducted environmental review under CEQA. The ruling made in the case concerned the environmental impacts of adopting the thresholds and how the thresholds would indirectly affect land use development patterns. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds. However, this litigation remains pending as the California Supreme Court recently accepted a portion of CBIA's petition to review the appellate court's decision. The specific portion of the argument to be considered is in regard to whether CEQA requires consideration of the effects of the environment on a project (as contrasted to the effects of a proposed project on the environment). Therefore, the significance thresholds contained in the 2011 CEQA Air Quality Guidelines are applied to this project.

Discussion

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less than Significant. The most recent clean air plan is the Bay Area 2010 Clean Air Plan that was adopted by the BAAQMD in September 2010. The proposed project would not conflict with the latest clean air planning efforts because the project would have emissions well below the BAAQMD thresholds (see Items (b) and (c) below), and development would be near existing transit with regional connections. The project is too small to incorporate project-specific transportation control measures listed in the latest Clean Air Plan (i.e., Bay Area 2010 Clean Air Plan). Therefore, the project's impact is considered less than significant.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less Than Significant with Mitigation Incorporated. As part of an effort to attain and maintain ambient air quality standards for ozone and particulate matter, BAAQMD has established thresholds of significance for these air pollutants and their precursors. These thresholds are for ozone precursor pollutants (ROG and NO_x), PM_{10}, and $PM_{2.5}$ and apply to both construction-period and operational-period impacts. Projects that have emissions below these thresholds are not considered to cause or contribute to the violations of ozone, PM_{10}, or $PM_{2.5}$ standards in the Bay Area. Note that in developing thresholds of significance for air pollutant emissions, BAAQMD considered the emissions levels for which a project's individual emissions would be cumulatively considerable. Therefore, a project that has emissions below the significance thresholds would not have a cumulative significant impact with respect to the region's existing air quality conditions for ozone, PM_{10} and $PM_{2.5}$

Operation Emissions

Due to the project size, operational period emissions would be less than significant. In its 2011 *CEQA Air Quality Guidelines*, the BAAQMD identifies screening criteria for the sizes of land use projects that could result in significant air pollutant emissions. For operational impacts, the screening project size is identified at 451 dwelling units. Condominium/townhouse projects of a smaller size would be expected to have less-than-significant impacts with respect to operational-period emissions. Since the project proposes 31 dwelling units, it is concluded that emissions would be below the BAAQMD significance thresholds for the operational period. The project is of a size that does not meet or exceed BAAQMD screening criteria and, by default, such projects are considered to have less-than-significant project-level or cumulative impacts. Therefore, detailed modeling is not necessary to conclude that operational impacts would be less than significant. Stationary sources of air pollution (e.g., back-up generators) have not been identified for this project.

Carbon monoxide emissions from traffic generated by the project would be the pollutant of greatest concern at the local level. Congested intersections with a large volume of traffic have the greatest potential to cause high, localized concentrations of carbon monoxide. Air pollutant monitoring data indicate that carbon monoxide levels have been at healthy levels (i.e., below State and federal standards) in the Bay Area since the early 1990s. As a result, the region has been designated as attainment for the standard. There is an ambient air quality monitoring station in San Rafael that measures carbon monoxide concentrations. The highest measured level over any 8-hour averaging period during the last 3 years was 1.2 parts per million (ppm), compared to the ambient air quality standard of 9.0 ppm. The BAAQMD *CEQA Air Quality Guidelines* state that projects would have a less-than-significant impact with respect to carbon monoxide concentrations if project traffic would not increase volumes at affected intersections to more than 44,000 vehicles per hour. The project would generate a small amount of new traffic—16 trips during the peak PM hour, according to data provided for this study by W-Trans, so the contribution of project-generated traffic to these levels would be very small. Therefore, the project would not cause or contribute to a violation of an ambient air quality standard and this impact is considered less than significant.

Construction Emissions

The California Emissions Estimator Model (CalEEMod) Version 2013.2.2 was used to predict emissions from construction of the proposed improvements at the site assuming full build out of the project. The project land use types and size, and anticipated construction schedule were input to CalEEMod. The CalEEMod model was developed by the South Coast Air Quality Management District with assistance from other air districts in California including the BAAQMD.[1]

CalEEMod provided annual emissions for construction. CalEEMod provides emission estimates for both on-site and off-site construction activities. On-site activities are primarily made up of construction and earthmoving equipment, while off-site activity includes worker, hauling, and vendor traffic. A construction build-out scenario, including equipment list and phasing schedule, was developed based on information provided by the project applicant. The proposed project land uses were input into CalEEMod, which included 31 dwelling units entered as "Condo/Townhouse," and 79 parking lot spaces. It was estimated that the project would require up to 1,200 tons of soil export during the grading phase, which was entered into the model. In addition, the proposed RAP work is expected to require a maximum of 3,500 cubic yards of soil import and 3,500 cubic yards of soil export.[2] The anticipated 5,000 square feet of building demolition and 1,500 tons of pavement demolition were also entered into the model.

The project schedule with the RAP work assumes that the project would be built out over a period of approximately one year from August 2016 to August 2017 or an estimated 260 construction workdays. Modeling also included the demolition work that already occurred in April of 2015 for approximately 6 workdays. In order to provide a conservative assessment of project impacts, Table 3 also shows average daily emissions for the RAP work only, since it is possible that RAP work could be conducted alone without implementation of the full project.

Average daily emissions were computed by dividing the total construction emissions by the number of construction days. Table 3 shows average daily construction emissions of ROG, NO_x, PM_{10} exhaust, and $PM_{2.5}$ exhaust during construction of the project under both scenarios. As indicated in Table 3, predicted project emissions would not exceed the BAAQMD significance thresholds. Appendix C includes the CalEEMod input and output values for construction emissions.

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[1] CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for lead agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operation from a variety of land use projects.

[2] The Draft Rap estimates the soil export volume to be closer to 2,800 cubic yards; however, 3,500 cubic yards was used for the air quality analysis as a more conservative estimate.

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. The BAAQMD *CEQA Air Quality Guidelines* consider these impacts to be less than significant if best management practices are implemented to reduce these emissions. **Mitigation Measure AIR-1** would require implementation of the BAAQMD-recommended best management practices. In addition, because of the proposed soil remediation work, Mitigation Measure AIR-1 also includes implementation of BAAQMD's Additional Construction Mitigation Measures. Finally, implementation of **Mitigation Measure HAZ-1a** through **HAZ 1g** would ensure that the Soil Management Plan (SMP) of the RAP has been finalized and approved and that a qualified environmental monitor will be present at the site during all remedial activities, including excavation or other earthmoving, to ensure implementation of dust control measures.

TABLE 3 CONSTRUCTION PERIOD EMISSIONS

Scenario	**ROG**	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Full construction period with RAP and demolition				
Construction emissions (tons)	0.55	1.24	0.07	0.06
Average daily emissions (pounds)[1]	4.2	9.5	0.5	0.3
RAP only				
Construction emissions (tons)	0.02	0.22	0.01	0.01
Average daily emissions (pounds)[2]	2.7	29.3	1.3	1.3
BAAQMD Thresholds (pounds per day)	*54*	*54*	*82*	*54*
Exceed Threshold?	No	No	No	No

Source: Illingworth & Rodkin, 2016.
Note: [1]Assumes 260 workdays, [2]Assumes 15 workdays.

Fugitive Dust During Construction

The project would construct new residential units. Construction activities could temporarily expose nearby sensitive receptors (located adjacent to the project site) to substantial pollutant concentrations, principally PM_{10}, from fugitive dust sources. This is a potentially significant impact. However, implementation of **Mitigation Measure AIR-1**, which would ensure compliance with the BAAQMD BMPs and enhanced measures for fugitive dust control, and implementation of **Mitigation Measure HAZ-1a** through **HAZ-1g**, would reduce the impact to a less-than-significant level.

Mitigation Measure AIR-1: The project applicant shall institute a dust control program during the construction phase of the project (see *Section VIII, Hazards* for additional dust control measures during remediation activities). Elements of the dust control program shall include, but not necessarily be limited to, the following:

- An inventory of construction equipment and schedule for equipment use shall be submitted to the City of Novato before issuance of demolition and/or grading permits. See Mitigation Measure AIR-2 for further requirements.
- All exposed surfaces (i.e., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered using recycled water as necessary to control dust.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered and anchored to prevent exposure.
- All visible mud or dirt tracked out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day or more frequently should mud or dirt be visible on adjacent roads. The use of dry power sweeping shall be prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.
- All paving shall be completed as soon as possible. All exposed soil shall be stabilized (e.g. hydroseeding or soil binders) until the building pad is laid.
- .
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with the manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- A publicly visible sign shall be posted with the name and telephone number of the person representing the project sponsor to contact regarding dust complaints. This person shall respond and take corrective action within one (1) hour of receiving a complaint. The Bay Area Air Quality Management District (BAAQMD)

and City of Novato phone number shall also be visible to ensure compliance with applicable regulations.

Additional Construction Mitigation Measures

- All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe. Water for dust control will be monitored to ensure an application rate that prevents runoff to off-site locations, discharge to storm drain, or any nearby water features (e.g., Pacheco Creek).
- Stockpiled soil, if any, will be covered with plastic sheeting, or other similar material, at the end of each workday. A stockpile that is known to be inactive shall be immediately covered with plastic sheeting or a similar material. A stockpile that is not being actively worked on for more than 60 minutes will be covered with plastic sheeting or a similar material to prevent dust from leaving the Site.
- All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
- Wind breaks (e.g., fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
- Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted immediately in areas with exposed soil and no further soil disturbance is anticipated and watered appropriately until vegetation is established.
- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
- All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
- Site accesses from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.

Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent (see Mitigation Measure HYD-1 regarding the implementation of a Stormwater Pollution Prevention Plan (SWPPP) and Stormwater Control Plan). Compliance with these regulations would reduce the potential for public health hazards associated with fugitive dust to a less-than-significant level.

c) *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air* *quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?*

Less Than Significant with Mitigation Incorporated. As described in Item (b) above, both construction and operation emissions would be below the BAAQMD screening size, which indicates the project would have less-than-significant emissions of ozone precursor pollutants, PM_{10} and $PM_{2.5}$. Implementation of **Mitigation Measure AIR-1** and **Mitigation Measures HAZ-1a** through **HAZ-1g** (see *Section VIII.a*, *Hazards*, page 90) would be required to reduce the impact from construction fugitive dust emissions to a less-than-significant level. As a result, the project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard. Also as discussed in Item (b) above, the project would not cause or contribute to violations of a carbon monoxide standard. Therefore, the project's contribution to cumulative air pollution in the region would be less than significant with implementation of **Mitigation Measure AIR-1** and **Mitigation Measures HAZ-1a** through **HAZ-1g**.

d) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant with Mitigation Incorporated. The BAAQMD-adopted "Thresholds of Significance" for local community risk and hazard impacts apply to both the siting of a new source and to the siting of a new receptor. Local community risk and hazard impacts are associated with TACs and $PM_{2.5}$ because emissions of these pollutants can have significant health impacts at the local level. The BAAQMD guidelines recommend the following thresholds:

- If emissions of TACs or $PM_{2.5}$ exceed any of the Thresholds of Significance listed below, the proposed project would result in a significant impact.
- Non-compliance with a qualified risk reduction plan; or
- An excess cancer risk level of more than 10 in 1 million, or a non-cancer (i.e., chronic or acute) Hazard Index greater than 1.0 would be a cumulatively considerable contribution; An incremental increase of greater than 0.3 micrograms per cubic meter (µg/m3) annual average PM2.5 would be a cumulatively considerable contribution.

Exposure of New Sensitive Receptors (Project Residents) to Pollutants

Stationary sources of TACs commonly include gas-dispensing facilities and back-up power generators and are typically only a concern when they are within 1,000 feet of sensitive receptors. Using the BAAQMD's Stationary Screening Tool, it was determined that there are no stationary sources of TACs within 1,000 feet of the project site.

Traffic on high-volume roadways is a source of TAC emissions that may adversely affect sensitive receptors that reside in close proximity. In the vicinity of the project area U.S. Highway 101 has 165,000 average daily trips (ADT), as reported by Caltrans (Caltrans 2013a).

The project site is located 800 feet or farther east of U.S. Highway 101. According to the BAAQMD Highway Screening Analysis Tool (BAAQMD, 2011b) at a distance of 750 feet and 6 foot elevation (receptor height) cancer risk is 15.6 in 1 million, annual $PM_{2.5}$ concentration is 0.15 µg/m^3, and the Hazard Index is 0.015. Since the screening cancer risk exceeds 10 in 1 million, a refined analysis of the impacts of TACs and $PM_{2.5}$ is necessary to evaluate potential cancer risks to new residents from U.S. Highway 101.

The refined analysis involved the development of DPM, organic TAC, and $PM_{2.5}$ emissions for traffic on U.S. Highway 101 using the CARB EMFAC2014 emission factor model and the traffic mix developed from Caltrans traffic data. EMFAC2014 is the most recent version of the CARB motor vehicle emission factor model. DPM emissions are projected to decrease in the future and are reflected in the EMFAC2014 emissions data. CARB regulations require on-road diesel trucks to be retrofitted with particulate matter controls or replaced to meet new 2010 engine standards that have much lower DPM and $PM_{2.5}$ emissions than prior years. This regulation will substantially reduce these emissions between 2013 and 2023, with the greatest reductions occurring in 2013 through 2015. While new trucks and buses will meet strict federal standards, this measure is intended to accelerate the rate at which the fleet either turns over so there are a greater number of cleaner vehicles on the road, or retrofitted to meet similar standards. With this regulation, older, more polluting trucks would be removed from the roads much more quickly.

Emission factors were developed for the year 2018 using a calculated mix of cars and trucks on U.S. Highway 101. Default EMFAC2014 vehicle model year distributions for Marin County were used in calculating emissions for 2018. Average daily traffic volumes and truck percentages for U.S. Highway 101 were based on Caltrans data (Caltrans 2015a, 2015b). Traffic volumes were assumed to increase 1 percent per year. Average hourly traffic distributions for Marin County roadways were developed using the EMFAC model,[3] which were then applied to the average daily traffic volumes in the site vicinity to obtain estimated hourly traffic volumes and emissions for U.S. Highway 101.

For all hours of the day on U.S. Highway 101, other than during peak AM and PM periods, an average speed of 65 mph was assumed for all vehicles other than trucks which were assumed to travel at a speed of 60 mph. For 2-hour periods during the peak AM and peak

[3] The Burden output from EMFAC2007, CARB's previous version of the EMFAC model, was used for this since the current web-based version of EMFAC2014 does not include Burden type output with hour by hour traffic volume information.

PM periods, average travel speeds of 30 mph were used for northbound and southbound traffic (TAM, 2013).

For $PM_{2.5}$, emissions from all vehicles were used rather than just the diesel powered vehicles used for DPM emissions because all vehicle types (i.e., gasoline and diesel powered) produce $PM_{2.5}$. Additionally, $PM_{2.5}$ emissions from entrained road dust, vehicle tire, and brake wear were included in the overall $PM_{2.5}$ emissions.

Emissions of total organic gas (TOG) were also calculated for 2018 using the EMFAC2014 model. These TOG emissions were then used in modeling the risks from organic TACs. TOG emissions from exhaust and for running evaporative loses from gasoline vehicles were calculated using EMFAC2014 default model values for Marin County along with the traffic volumes and vehicle mixes for U.S. Highway 101.

Use of 2018 emissions as being representative of future conditions over the 30-year period used for calculating cancer risks is a conservative assumption since, as discussed above, overall vehicle emissions, and in particular diesel truck emissions, will decrease in the future. The hourly traffic distributions and emission rates used in the analysis are shown in Appendix B.

Dispersion modeling of DPM and $PM_{2.5}$ emissions was conducted using the CAL3QHCR model, which is recommended by the BAAQMD for this type of analysis. A 5-year set of hourly meteorological data (2001–2005) for the Sonoma Baylands obtained from BAAQMD was used in the modeling. The Sonoma Baylands monitoring station is about 5 miles northeast of the project site. Other inputs to the model included road geometry, hourly traffic volumes, and emission factors. North- and south-bound traffic on U.S. Highway 101 within about 1,000 feet of the project site was evaluated with the model. The modeling used a grid of receptors with receptors spaced every 10 meters (about 33 feet) within the proposed residential area. Receptor heights of 1.5 and 4.5 meters were used to represent breathing heights of residents on first and second floor levels of the residential units. Figure 3 shows the roadway links and residential receptor locations used in the modeling.

Using the annual average TAC concentrations, the individual cancer risks were computed using the most recent methods recommended by BAAQMD. The factors used to compute cancer risk are highly dependent on modeled concentrations, exposure period or duration, and the type of receptor. The exposure level is determined by the modeled concentration; however, it has to be averaged over a representative exposure period. The averaging period is dependent on many factors, but mostly the type of sensitive receptor being evaluated. This assessment conservatively assumed long-term residential exposures. The BAAQMD has developed exposure assumptions for typical types of sensitive receptors. Appendix C includes a description of how community risk impacts, including cancer risk are computed.

The maximum increased cancer risk from traffic on U.S. Highway 101 was computed as 5.8 in 1 million. This was modeled at the residential receptor along the eastern border of the project's residential area and is shown on Figure 3. Cancer risks from U.S. Highway 101 at other locations within the project site would be lower than the maximum risk. The maximum increased cancer risk is below the BAAQMD's threshold of 10 in 1 million excess cancer cases.

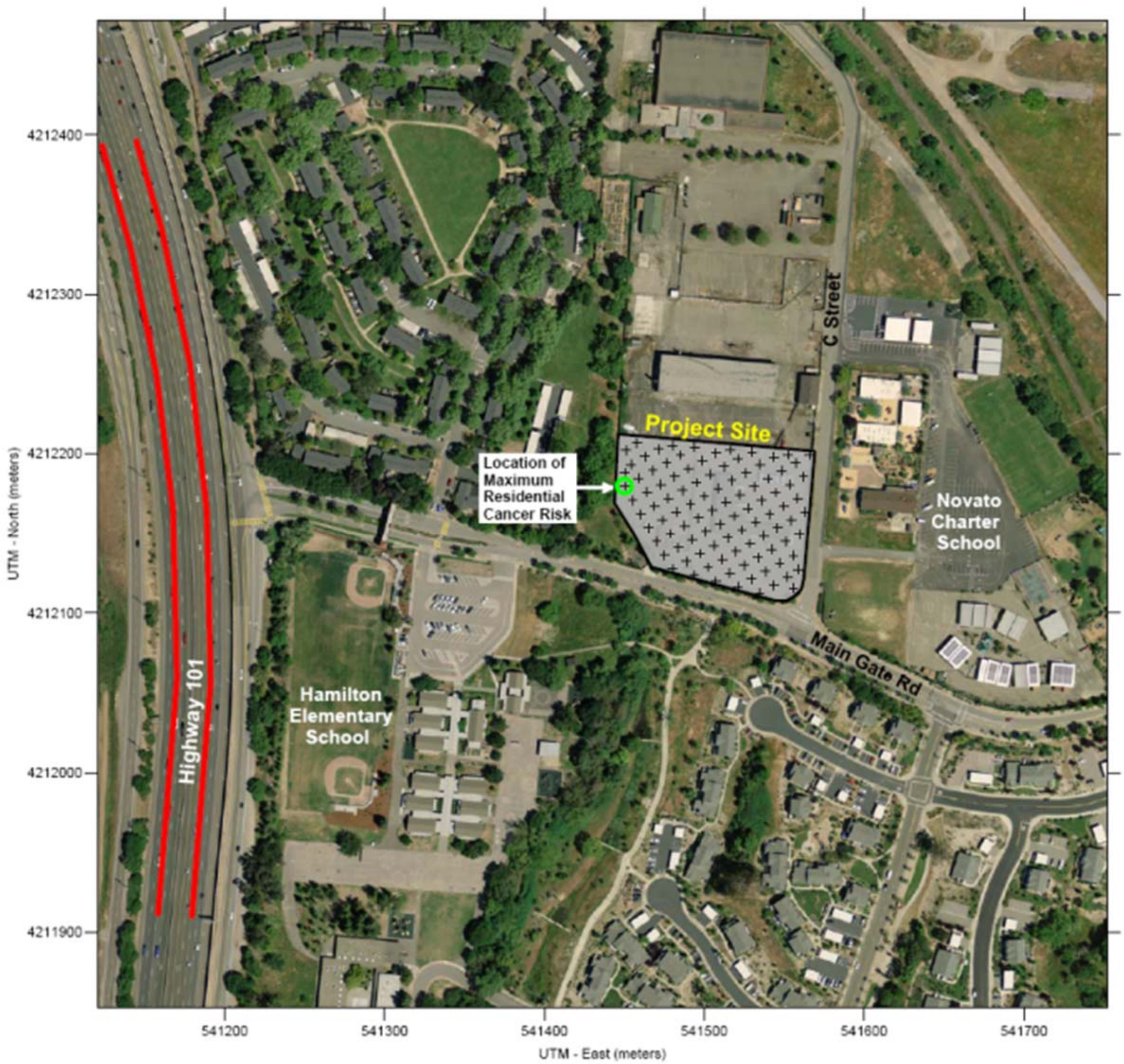

FIGURE 3 PROJECT SITE, ROADWAY LINKS, AND PROJECT SENSITIVE RECEPTOR LOCATIONS

Potential non-cancer health effects due to chronic exposure to DPM were also evaluated. The chronic inhalation reference exposure level (REL) for DPM is 5 µg/m^3. The maximum predicted annual DPM concentration from U.S. Highway 101 traffic was 0.007 µg/m^3, which is much lower than the REL. The Hazard Index, which is the ratio of the annual DPM concentration to the REL, is 0.001. This HI is much lower than the BAAQMD significance criterion of a HI greater than 1.0.

In addition to evaluating the health risks from TACs, potential impacts from $PM_{2.5}$ emissions from vehicles traveling on U.S. Highway 101 were evaluated. To evaluate potential non-cancer health effects due to $PM_{2.5}$, the BAAQMD adopted a significance threshold of an annual average $PM_{2.5}$ concentration greater than 0.3 µg/m^3.

Based on the dispersion modeling of U.S. Highway 101 traffic emissions, the maximum annual average $PM_{2.5}$ concentration occurred at the same location that had maximum cancer risks, as shown on Figure 3. The maximum average annual concentration was 0.15 µg/m^3. This $PM_{2.5}$ concentration is below the BAAQMD's threshold of 0.3 µg/m^3.

The project would be located about 500 feet from a rail line. This rail line does not include freight train traffic, which heads east at the "Ignacio Y" and travels along Highway 37 north of the project site by approximately 2-miles. The Sonoma-Marin Area Rail Transit (SMART) trains would use this rail line and there would be fewer than 10 train passages per day. The trains would be modern diesel-powered trains, which are expected to have relatively low emissions. The SMART Train Draft Environmental Impact Report (DEIR) predicted $PM_{2.5}$ concentrations of well below 0.1 µg/m^3 and excess cancer risk of less than 1 per million at 30 feet from tracks (SMART, 2005). Emissions of diesel exhaust from train passages near the site are not expected to cause significant exposures for future project residents.

Exposure of Existing Sensitive Receptors (Nearby Residents and Schoolchildren) to Pollutants from Project Construction

The main exposure of existing sensitive receptors to air pollutants from the project would occur during project construction. Sensitive receptors, which include residences north of Main Gate Road between U.S. Highway 101 and the eastern boundary of the project site and residences southwest of the project site on the south side of Main Gate Road, would be temporarily affected by construction activities. These residences include Lanham Village and Meadow Park. Additionally, there are two schools and two daycare/preschool facilities in the project area that would be affected by construction activities, Hamilton Elementary School is located about 400 feet southwest of the project site and the Novato Charter School located about 300 feet to the east of the project site across "C" Street. The North Bay Children's Center is directly across "C" Street from the project site and the Wonder Nook Preschool in Lanham Village on Martin Drive is about 300 feet north-northwest of the project site. Additionally, the South Novato Library is located approximately 250 feet north-northeast of the project site.[4] The locations of these sensitive receptors are shown on Figure 4. Project operations would not generate significant air pollutants. The analysis of risk associated with remediation of contaminated soil is discussed in *Section VIII.a, Hazards*.

Health Risk from Construction-Period Emissions

Construction-period emissions were calculated using the CalEEMod model, as described above. Inputs to the model included project size, location, construction schedule, and proposed pieces of construction equipment for use supplied by the project applicant and hauling volume estimates.

Construction emissions were input to the United States Environmental Protection Agency (U.S. EPA) ISCST3 dispersion model to predict concentrations of DPM and $PM_{2.5}$ at the existing nearby residences, schools, and daycare facilities. The ISCST3 dispersion model is a BAAQMD-recommended model for use in modeling analysis of these types of emission activities for CEQA projects (BAAQMD, 2012). A 5-year set of hourly meteorological data (2001–2005) for the Sonoma Baylands obtained from BAAQMD was used in the modeling. The ISCST3 modeling of construction activities used two area sources to represent the on-site construction emissions, one for DPM exhaust emissions and the other for fugitive $PM_{2.5}$ dust emissions. To represent the construction equipment exhaust emissions, an emission release height of 6 meters was used for the area source. The elevated source height reflects the height of the equipment exhaust pipes and buoyancy of the exhaust plume. For modeling fugitive $PM_{2.5}$ emissions, a near ground level release height of 2 meters was used for the area source. Emissions from vehicle travel around the project site were included in the modeled area sources. Construction emissions were modeled as occurring daily between 7 a.m. and 4 p.m.

Modeled receptor locations were positioned at residential dwelling units and in nearby school and daycare areas. For residential receptor locations two receptor heights were evaluated, 1.5 meters and 4.5 meters above ground level, representative of first and second story levels. For schoolchild and daycare receptors a receptor height of 1.25 meters above the ground was used. Figure 4 shows the construction area modeled and locations of nearby sensitive receptors.

Increased cancer risks were calculated using the maximum annual concentration and BAAQMD-recommended risk assessment methods for infant, child, and adult exposures, as described in Appendix C.

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[4] Sensitive receptor locations are places with people that have an increased sensitivity to air pollution or environmental contaminants, including schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling unit(s).

Results of the assessment of construction activities with RAP work are summarized in Table 4 which shows the maximum health impacts (cancer risk, $PM_{2.5}$ concentration, and Hazard Index) that would occur for residential exposures, schoolchildren, and daycare/preschool infants, and children exposures. The residential child cancer risk is based on the assumption that each residential receptor would be a location where an infant is present and would reside at that location almost continuously throughout the construction period. Residential adult cancer risk assumes that an adult, who is far less sensitive to TACs, would reside at each residential receptor almost continuously throughout the construction period. For schoolchildren and daycare/preschool infants and children it is conservatively assumed that the infants and children would be at the schools and daycare/preschools evaluated during the daytime when construction would occur for the entire construction period.

The maximum increased cancer risk of 17.9 excess cancer cases per million would occur at the North Bay Children's Center for an infant exposure. The maximum annual $PM_{2.5}$ concentration of 0.2 $\mu g/m^3$ and Hazard Index of 0.02 would also occur at the North Bay Children's Center. Figure 4 shows the locations of the maximum residential and non-residential infant/child cancer risks.

Under the BAAQMD *CEQA Air Quality Guidelines*, an incremental risk of greater than 10.0 cases per million from a single source at the Maximally Exposed Individual (MEI) would be a significant impact. The project's lifetime cancer risk to adults and children are below the BAAQMD's cancer risk threshold. However, the cancer risk to an infant at the North Bay Children's Center would be 7.9 cases per million greater than the cancer risk threshold of 10.0 cases per million. Implementation of **Mitigation Measure AIR-2** would reduce this impact to a less-than-significant level.

Potential non-cancer health effects due to chronic exposure to DPM were also evaluated. The Hazard Index based on the maximum DPM concentration is used as the indicator of non-cancer health effects. The maximum Hazard Index of 0.02 is much lower than the BAAQMD significance criterion of a Hazard Index greater than 1.0.

The maximum annual $PM_{2.5}$ concentrations from construction would be 0.23 $\mu g/m^3$ which is below the BAAQMD significance threshold of 0.3 $\mu g/m^3$.

Appendix C includes the emission calculations used for the modeling and the cancer risk calculations.

> Mitigation Measure AIR-2: The applicant shall develop a plan for the project demonstrating that the off-road equipment to be used on-site to construct the project would achieve a fleet-wide average 45 percent reduction in $PM_{2.5}$ exhaust emissions or more. One feasible plan to achieve this reduction would include the following:

- All mobile diesel-powered off-road equipment larger than 50 horsepower and operating on the site for more than two days shall meet, at a minimum, U.S. EPA particulate matter emissions standards for Tier 2 engines or equivalent; and
- All diesel-powered portable equipment (i.e., aerial lifts, air compressors, concrete saws, forklifts, and generators) operating on the site for more than two days shall meet U.S. EPA particulate matter emissions standards for Tier 4 engines or equivalent. Note that the construction contractor could use other measures to minimize construction period DPM emission to reduce the predicted cancer risk below the thresholds. The use of equipment that includes CARB-certified Level 3 Diesel articulate Filters5 or alternatively-fueled equipment (i.e., non-diesel) would meet this requirement. Other measures may be the use of added exhaust devices, or a combination of measures, provided that these measures are approved by the City and demonstrated to reduce community risk impacts to a less-than-significant level.

TABLE 4 MAXIMUM HEALTH RISK IMPACTS FROM CONSTRUCTION WITH MITIGATION

Sensitive Receptor Type	Cancer Risk (per million)	Maximum Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Residential			
Residential - Child	1.8	0.01	<0.01
Residential - Adult	0.03	0.01	<0.01
School Children			
Novato Charter School – Child	0.5	0.03	<0.01
Hamilton Elementary School - Child	0.05	<0.01	<0.01
Daycare/Preschool			
North Bay Children's Center - Infant	4.0	0.03	<0.01
North Bay Children's Center - Child	0.6	0.03	<0.01
Wonder Nook Preschool - Child	0.5	0.03	<0.01
BAAQMD Thresholds	*>10.0*	*>0.3*	*>1*
Exceed Threshold?	No	No	No

Source: Illingworth & Rodkin, 2016.

[5] See http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm

FIGURE 4 PROJECT SITE, CONSTRUCTION AREA, AND OFF-SITE SENSITIVE RECEPTORS

Implementation of recommended best management practices (i.e., **Mitigation Measure AIR-1**) is considered to reduce exhaust emissions by 5 percent and fugitive dust emissions by over 50 percent. Implementation of **Mitigation Measure AIR-2** would further reduce on-site diesel exhaust emissions. With this mitigation, the computed maximum increased lifetime cancer risk from construction, assuming infant exposure at North Bay Children's Center, would be 4.0 in one million, as shown in Table 4. This cancer risk would be below the BAAQMD threshold of greater than 10.0 per one million for cancer risk. After implementation of these recommended measures, the project would have a less-than-significant impact with respect to community risk caused by construction activities.

Fugitive Dust During Construction
As discussed above under Item (b), the project would pose a potentially significant impact from construction period fugitive dust. However, implementation of **Mitigation Measure AIR-1**, which would ensure compliance with BAAQMD BMPs and enhanced measures for fugitive dust control, and implementation of **Mitigation Measures HAZ-1a** through **HAZ-1g**, which would ensure that the SMP (including air monitoring of organic vapors and gases) is finalized and approved prior to approval of the project, would reduce the impact to a less-than-significant level.

Cumulative TAC Exposure

The BAAQMD *CEQA Air Quality Guidelines* include significance thresholds for cumulative TAC exposure. A project would have a cumulatively considerable impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000-foot radius of the fence line of a source or from the location of a receptor would exceed the following thresholds:

- An excess cancer risk level of more than 100 per million or a chronic non-cancer Hazard Index (from all local sources) greater than 10.0.
- 0.8 µg/m3 annual average $PM_{2.5}$.

For new sensitive receptors (i.e., residences), the only considerable source of TAC exposure is U.S. Highway 101 traffic. The cancer risks and non-cancer health effects of that source would be well below the significance thresholds for cumulative exposures described above. Exposure from SMART trains would not contribute measurably to the cumulative exposures.

Cumulative Construction TAC Exposure

A review of the project vicinity and consultation with the City revealed two nearby construction projects that may be constructed simultaneously with the proposed project. The 801 State Access project includes 48 senior apartment units about 900 feet north of the proposed project. The 801 State Access Initial Study (City of Novato, 2013) was used to estimate community risk impacts at the project construction residential and daycare MEIs. The Hamilton Cottages project would construct 16 single-family residences about 780 feet northeast of the proposed project. A CalEEMod run using model defaults for a project of that type and size was used to estimate DPM and $PM_{2.5}$ emissions. Both the Hamilton Fields and Hamilton Hospital projects would be located over 1,000 feet[6] from the construction MEIs and, therefore, were not evaluated in the assessment of cumulative construction risk. The SMART Hamilton Station project construction will be almost complete by the time construction of the proposed project would begin, including all major grading and building construction. Therefore, the SMART Hamilton Station project was also not evaluated in the assessment of cumulative construction risk.

Health risk modeling was conducted using the ISCST3 model and the same methodology described above from the project to evaluate cumulative construction risk. Results of modeling indicates that the maximum increased cancer risks would be 19.6 in one million at the North Bay Children's Center and 12.3 in one million at the residential MEI, respectively. These risk values would be below the BAAQMD cumulative threshold of 100 in one million. Annual $PM_{2.5}$ concentrations and Hazard Index at the MEIs would also be well below the BAAQMD cumulative thresholds.

Conclusion

With implementation of **Mitigation Measure AIR-1** and **AIR-2**, and **Mitigation Measures HAZ-1a** through **HAZ-1g**, project construction would not be expected to expose sensitive receptors to substantial pollutant concentrations, violate any air quality standard, or contribute to an existing or projected air quality violation. Therefore, construction impacts would be considered less than significant with mitigation.

e) Create objectionable odors affecting a substantial number of people?

Less than Significant. As a general matter, the types of land use development that pose potential odor problems include wastewater treatment plants, refineries, landfills, composting facilities, transfer stations, and sometimes restaurants. No such uses would occupy the project site. The BAAQMD considers five confirmed odor complaints per year to represent a significant odor impact. Odors resulting from the combustion of diesel during project construction could create objectionable odors. However, these odors would subside once project construction is concluded and are not anticipated to result in five confirmed odor complaints. During remediation work, petroleum hydrocarbon odors could be present. However, implementation of **Mitigation Measure HAZ-1a** through **HAZ-1g** would ensure that the SMP, including on-site monitoring for odors, is finalized and approved before any permits are issued and that the plan is followed during construction. **Mitigation Measure HAZ-1b** specifies the application of non-toxic vapor suppressants to minimize odors during soil excavation and hauling. Therefore, with implementation of **Mitigation Measures HAZ-1a** through **HAZ-1g**, the project would not create objectionable odors that would affect a substantial number of people. Also, there are no existing odor

[6] A buffer of 1,000 feet is based on BAAQMD 2011 CEQA Air Quality Guidelines.

sources in the vicinity of the project site that would significantly affect the project occupants. Odor impacts are therefore considered less than significant.

Cumulative Impacts

This air quality analysis uses thresholds that were developed by the BAAQMD in its 2011 *CEQA Air Quality Guidelines*. In developing thresholds of significance for air pollutants, the BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts on the region's existing air quality conditions. Therefore, the analysis provided addresses both project and cumulative impacts. Additional analysis to assess cumulative impacts for criteria air pollutants is not necessary. Construction of the project is anticipated to result in a potentially significant impact due to localized emissions of fugitive dust and exhaust. **Mitigation Measure AIR-1** and **AIR-2**, and **Mitigation Measures HAZ-1a** through **HAZ-1g** would reduce these impacts to a less-than-significant level. Cumulative TAC impacts were addressed and found to be less than significant. Thus, the proposed project with **Mitigation Measure AIR-1** and **AIR-2**, and **Mitigation Measures HAZ-1a** through **HAZ-1b** would not result in or contribute to any significant cumulative air quality impacts.

IV. BIOLOGICAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	❐	❐	❐	■
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	❐	❐	❐	■
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	❐	❐	❐	■
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	❐	❐	❐	■
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	❐	❐	❐	■
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	❐	❐	❐	■

No Impact. The project site is located within a developed area of Novato. The project site is currently vacant and has no natural vegetation, habitat for special-status species, wetlands, or riparian habitats. There are also no jurisdictional wetlands or waters which occur within the project site and no known wildlife corridors on the site. The project does not have a Bayland overlay and no other policy designations are associated with the site. No trees would be removed as part of the proposed project. There is no habitat conservation plan, natural community conservation plan, or related plan that governs the developed area of Hamilton Field. The site is currently completely paved. The project will add open space and landscaping to the site, increasing the total amount of pervious surfaces.

V. CULTURAL RESOURCES Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	❒	❒	■	❒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	❒	■	❒	❒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	❒	■	❒	❒
d) Disturb any human remains, including those interred outside of formal cemeteries?	❒	■	❒	❒

Affected Environment

The analysis considers the project's impact to historic architectural, archeological resources and human remains, and paleontological resources on the project site.

Discussion

a) Would the project cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

Less than Significant. The area of Hamilton Field commonly known as the Exchange Triangle, which contains the subject property, is within the section identified as Base Industry 2 in the Historic American Building Survey (HABS) documentation (Maniery, 1995). Base Industry 2 was one of two industrial areas developed at Hamilton Field during World War II.

Due to numerous significant alterations undertaken after 1993, it was determined that only three areas (mostly in the southwest area of Hamilton Field) within the original proposed district boundaries retained sufficient integrity to remain eligible for listing on the National Register of Historic Places (NRHP) (NRHP, 2014) (PAR, 1997). A nomination was prepared and the Hamilton Army Air Field Discontiguous Historic District was listed on the NRHP in 1998. The Exchange Triangle, including the project site, was excluded from boundaries of the National Register Historic District (Maniery, 1998).

The project site contains no historical resources as defined in CEQA Guidelines Section 15064.5; therefore the project would have a less-than-significant impact on historical resources.

b) *Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?*

Less Than Significant with Mitigation Incorporated. Although the likelihood of encountering archaeological resources on the project site is low, the project site is in the vicinity of areas with recorded resources. The mitigation measures below would reduce this potential impact to a less-than-significant level.

The City's Cultural Resources Ordinance (No. 923) guides the process for preserving and studying valuable cultural resources. The Cultural Resources Ordinance requires an archaeological investigation permit prior to commencement of work and prior to issuance of any building or grading permit whenever construction or other activities are proposed which will disturb a recorded or otherwise previously encountered cultural resource or a cultural site.

There is a very low possibility of unrecorded buried cultural resources in this area, as the project area is entirely on fill material. Archival research found that two studies cover Hamilton Field, including the project site (ACRS 1987a; Maniery 1992). Seventeen other studies have been conducted within a 1/4-mile radius of the project site. The nearest recorded cultural resource is located about 1/8-mile away from the project site. No other resources are recorded within a 1/4-mile radius of the project site.

The ethnographic village of pūyū'kū was reported as being either 1 mile south of Ignacio or near Pacheco, five miles southwest of Ignacio (Barrett 1908; Kelly 1978; and Kroeber 1925). If the first report is accurate, it is possible that the village was located near the project site, however the lack of detail and agreement on its location make it difficult to place. Review of historical maps found two buildings within the study area in 1954 and a third L-shaped building in 1968 (Dodge 1892; General Land Office 1862; USACE 1942; USGS 1914, 1954a, 1954b; Whitney 1873).

Based on the distribution of known cultural resources and their environmental settings, it was anticipated that prehistoric archaeological sites could be found within the study area. Prehistoric archaeological site indicators expected to be found in the region include but are not limited to: obsidian and chert flakes and chipped stone tools; grinding and mashing implements such as slabs and handstones, and mortars and pestles; bedrock outcrops and boulders with mortar cups; and locally darkened midden soils containing some of the previously listed items plus fragments of bone, shellfish, and fire affected stones. Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps).

Should resources be uncovered during earth disturbing activities, **Mitigation Measure CULT-1** shall be followed. If human remains are uncovered, **Mitigation Measure CULT-2** shall be followed.

> Mitigation Measure CULT-1: In keeping with the CEQA guidelines, if archaeological remains are uncovered, work at the place of discovery should be halted immediately until a qualified archaeologist can evaluate the finds (§15064.5 [f]). Prehistoric archaeological site indicators include: obsidian and chert flakes and chipped stone tools; grinding and mashing implements (e.g., slabs and handstones, and mortars and pestles); bedrock outcrops and boulders with mortar cups; and locally darkened midden soils. Midden soils may contain a combination of any of the previously listed items with the possible addition of bone and shell remains, and fire affected stones. Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps).

> Mitigation Measure CULT-2: The following actions are promulgated in Public Resources Code 5097.98 and Health and Human Safety Code 7050.5, and pertain to the discovery of human remains. If human remains are encountered, excavation or disturbance of the location must be halted in the vicinity of the find, and the county coroner contacted. If the coroner determines the remains are Native American, the coroner will contact the Native American Heritage Commission. The Native American Heritage Commission will identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent makes recommendations regarding the treatment of the remains with appropriate dignity.

The proposed project would not result in any additional cumulative impacts to any cultural resources because the site's integrity had already been significantly diminished. Implementation of **Mitigation Measures CULT-1 and CULT-2** would reduce potential impacts on archaeological deposits and human remains to less-than-significant levels.

c) *Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*

Less than Significant with Mitigation Incorporated. The project site is situated on fill material and no paleontological sites, unique resources, or unique geological features have been recorded on or adjacent to the project site (Carrasco, M.A., B.P. Kraatz, E.B. Davis, and A.D. Barnosky, 2005). The closest recorded paleontological site is located approximately 13 miles east of the project site. Although unlikely, the potential to encounter unknown paleontological resources on the project site during grading and construction still exists. Therefore, in order to reduce potential impacts to paleontological resources, **Mitigation Measure CULT-3** shall be implemented.

> <u>Mitigation Measure CULT-3 Paleontological Resources</u>: If paleontological resources are encountered during project construction activities, all soil-disturbing activity within 100 feet of the find shall be temporarily halted until a qualified paleontologist can assess the significance of the find and provide proper management recommendations. The City shall review and incorporate the management recommendations into the project as feasible.

Implementation of **Mitigation Measure CULT-2** would reduce potential impacts on paleontological deposits to a less-than-significant level.

d) Would the project disturb any human remains, including those interred outside of formal cemeteries?

Less Than Significant with Mitigation Incorporated. Although no human remains are recorded at the project site, there remains a potential for discovering unknown human remains during excavation and site preparation. Implementation of **Mitigation Measure CULT-2** would reduce potential impacts on archaeological deposits and human remains to less-than-significant levels.

VI. GEOLOGY AND SOILS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	❒	❒	■	❒
ii. Strong seismic ground shaking?	❒	■	❒	❒
iii. Seismic-related ground failure, including liquefaction?	❒	■	❒	❒
iv. Landslides?	❒	❒	■	❒
b) Result in substantial soil erosion or the loss of topsoil?	❒	■	❒	❒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	❒	■	❒	❒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	❒	❒	■	❒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	❒	❒	❒	■

Affected Environment

Information regarding geology and soils for the project is based on a geotechnical report conducted for the project site in 2007 (Miller Pacific, 2007), as well as available public agency geologic hazard maps. No changes at the project site have occurred since that time that would affect the findings of the 2007 geotechnical report.

The project site is located within the Coast Range Geomorphic Province of California. The topography of the project site is relatively flat, with elevations ranging from 42.5 to 41.0 feet above mean sea level, sloping gently to the northwest (Miller Pacific, 2007). Soils at the site are mapped as Xerorthents-Urban Land Complex (NRCS, 2014). This soil unit is comprised of fills and reworked soils associated with developed urban areas. Soils in this unit have been altered to the extent that their original characteristics are no longer present. The soils are well drained, have varying water capacities, are prone to very rapid runoff, and have a high hazard of water erosion (NRCS, 2014). Soils in the project region are underlain by sedimentary, igneous, and metamorphic bedrock of the Franciscan Complex, a Jurassic-Cretaceous (65–190 million years ago) formation common throughout the California Coast Ranges (Miller Pacific, 2007).

Discussion

a) *Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:*

   i. *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.*

Less than Significant. No portion of the proposed project site is within an Alquist-Priolo Earthquake Fault Zone (A-PEFZ) (CGS, 2008), and no active faults have been mapped on the project site by the United States Geological Survey (USGS) or the California Geological Survey (CGS) (USGS and CGS, 2010). Fault rupture of the surface typically occurs along existing faults that have ruptured the surface in the past. Since faults with known surface rupture have been mapped in California, and none are known to occur at the project site, the potential for the proposed project to result in impacts due to fault rupture is less than significant.

   ii. *Strong seismic ground shaking?*

Less Than Significant with Mitigation Incorporated. Ground shaking is likely to occur within the life of the project as a result of future earthquakes. The project site is located approximately 9 miles west of the Hayward and Rodgers Creek Faults and 14.5 miles east of the San Andreas Fault. The Working Group on California Earthquake Probabilities and the USGS have predicted a 31 percent probability of a 6.7 magnitude or greater earthquake on the Hayward/Rodgers Creek Fault system between 2007 and 2036, a 21 percent chance on the San Andreas Fault system, and a total probability of 63 percent that an earthquake of that magnitude will occur on one of the regional San Francisco Bay Area faults during that time (CGS, 2008).

The geotechnical report for the project site identified a peak ground acceleration of 0.30g for a significant earthquake on the Hayward or San Andreas faults, and a peak ground acceleration of 0.26g for an earthquake on the Rodgers Creek Fault (Miller Pacific, 2007). The Association of Bay Area Governments (ABAG) has classified the Modified Mercalli Intensity Shaking Severity Level of ground shaking in the vicinity of the project site due to an earthquake on either of these faults as "VIII-Very Strong" (ABAG, 2013), indicating a peak ground acceleration between 0.34g and 0.65g. Very strong shaking would be expected to result in extensive damage to unreinforced masonry buildings, including partial collapse, fall of some masonry walls, twisting and falling of chimneys and monuments, and shifting of unbolted wood structures on their foundations.

The City of Novato has formally adopted the 2013 California Building Code (CBC) (Novato Municipal Code (NMC) Chapter 4-1.3). The CBC includes seismic safety provisions to ensure that structures are able to resist minor earthquakes undamaged, resist moderate earthquakes without significant structural damage, and resist severe earthquakes without collapse. The geotechnical report for the project site includes calculations of seismic design parameters in accordance with Chapter 16 of the CBC, based on site-specific ground movement created by the maximum credible earthquake at the project site.

The geotechnical report concluded that no significant geologic or geotechnical hazards at the site were present that would pose a constraint to development (Miller Pacific, 2007). However, the report recommended that a design-level geotechnical investigation be performed once the plans have been completed for the project to ensure that seismic and other geologic hazards are addressed in project design. **Mitigation Measure GEO-1**, which requires the project applicant to incorporate the recommendations of the geotechnical investigation in project design, would ensure that building designs reduce the potential for strong seismic shaking impacts to less-than-significant levels.

> Mitigation Measure GEO-1: Prior to the issuance of any grading or construction permits, a design-level geotechnical investigation shall be prepared by a licensed professional and submitted to the City Engineer for review and approval. The investigation shall verify that the project plans comply with CBC and City requirements and incorporate the recommendations for design contained in the 2007 geotechnical report for the project site. All design measures, recommendations, design criteria, and specifications set forth in the design-level geotechnical investigation shall be implemented as a condition of project approval.

iii. Seismic-related ground failure, including liquefaction?

Less Than Significant with Mitigation Incorporated. Liquefaction of soils can occur when ground shaking causes saturated soils to lose strength due to an increase in pore pressure. ABAG has identified the liquefaction hazard within the project vicinity as "moderate" (ABAG, 2003).

The geotechnical report for the project site noted that silty and clayey sand layers up to 30 feet in thickness were present beneath the project site, which could have a potential to liquefy during a seismic event. The report recommended that the potential for liquefaction be more clearly defined in a design-level geotechnical investigation (Miller Pacific, 2007). Should the design-level geotechnical investigation identify a significant potential for liquefaction, modifications to project design, such as deep foundations or subsurface ground improvement could be required (Miller Pacific, 2007). **Mitigation Measure GEO-1**, which requires incorporation of geotechnical report recommendations as part of the design-level geotechnical review to be prepared for the proposed project, would address the liquefaction hazard at the site and reduce any potential impacts to a less-than-significant level.

iv. Landslides?

Less than Significant. Slope stability issues can result in either slow slumping earth movements or rapid landslide events. The project site is level and is not located within a mapped landslide or landslide hazard area, or within an official zone of required investigation for seismically induced landsliding. Project improvements do not include substantial mounding of earth or other substantive changes to grade that would create slope instability hazards. Therefore, the landslide impact would be less than significant.

b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant with Mitigation Incorporated. Grading and earthmoving during remedial activities and project construction has the potential to result in erosion and loss of topsoil. Exposed soils could be entrained in stormwater runoff and transported off the project site. However, this impact would be mitigated to a less-than-significant level through implementation of existing grading and stormwater requirements.

Remedial activities and project construction would be subject to requirements of the Novato Grading Permit, which include Chapters 5-23, 6, and 19-20.050 of the NMC. NMC Chapter 5-23 requires that grading activities incorporate dust, mud, and siltation control so that no "irritation or harm" are caused beyond the boundaries of the construction site. It further requires erosion control measures on cut and fill slopes to prevent erosion following construction.

Earthmoving during remediation will be also be subject to the Soil Management Plan (SMP), part of the Remedial Action Plan (RAP) for the project, which includes measures such as drainage control and the covering of stockpiles to prevent soils from being entrained in stormwater runoff. A Stormwater Pollution Prevention Plan (SWPPP) will be required for construction at the project site. Although designed primarily to protect storm water quality, the SWPPP would incorporate Best Management Practices (BMPs) to minimize erosion. Additional details regarding the SWPPP are provided in *Section IX, Hydrology and Water Quality* of this Initial Study.

Implementation of **Mitigation Measure GEO-2**, below, implementing grading permit requirements and **Mitigation Measure HYD-1,** requiring a SWPPP would reduce any potential soil erosion impacts to a less-than-significant level.

<u>Mitigation Measure GEO-2:</u> As a condition of approval of grading and construction permits, the applicant shall demonstrate compliance with Novato Grading Permit requirements, including Chapters 5-23, 6 and 19-20.050 of the Novato Municipal Code. This shall include a description of required silt, mud, and siltation control measures that will be implemented during construction and necessary erosion control measures on any cut and fill slopes following construction.

c) *Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?*

Less Than Significant with Mitigation Incorporated. As noted above, under Liquefaction and Seismically-Related Ground Failure, liquefaction and/or seismic-induced ground settlement could occur at the site. The geotechnical report did not identify any other potential hazards due to unstable soils (Miller Pacific, 2007). If the design-level geotechnical investigation identifies potential hazards related to unstable soils, modifications to project design, such as deep foundations or subsurface ground improvement could be required (Miller Pacific, 2007). **Mitigation Measure GEO-1**, which requires incorporation of geotechnical report recommendations as part of the design-level geotechnical review to be prepared for the proposed project, would address the potential for unstable soils to create a hazard at the site and reduce any potential impacts to a less-than-significant level.

d) *Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?*

Less than Significant. Expansive soils expand and contract in response to changes in soil moisture, most notably when near surface soils change from saturated to dry, and back again. Clayey soils, such as the soils identified at the project site, have the potential to shrink and swell, which could potentially cause damage to building foundations, roadways, and other project improvements.

The geotechnical report noted that the lack of desiccation cracks observed in soil areas suggested that expansive soil potential is minimal and no changes to project design would be required (Miller Pacific, 2007). Therefore, potential impacts from expansive soils are considered less than significant.

e) *Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?*

No Impact. The proposed project does not include the installation or use of septic or on-site wastewater disposal systems, and the proposed buildings would be connected to the City sanitary sewer system. Therefore, no geologic or soils impact would occur.

VII. GREENHOUSE GAS EMISSIONS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	❒	❒	■	❒
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	❒	❒	■	❒

Affected Environment

Global temperatures are affected by naturally occurring and anthropogenic-generated (generated by humankind) atmospheric gases, such as water vapor, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (Intergovernmental Panel on Climate Change, 2007). Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). Solar radiation enters the earth's atmosphere from space, and a portion of the radiation is absorbed at the surface. The earth emits this radiation back toward space as infrared radiation. GHGs, which are mostly transparent to incoming solar radiation, are effective in absorbing infrared radiation and redirecting some of this back to the earth's surface. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This is known as the "greenhouse effect." The greenhouse effect helps maintain a habitable climate. Emissions of GHGs from human activities, such as electricity production, motor vehicle use, and agriculture, are elevating the concentration of GHGs in the atmosphere and are reported to have led to a trend of unnatural warming of the earth's natural climate, known as global warming or global climate change. The term "global climate change" is often used interchangeably with the term "global warming," but "global climate change" is preferred because it implies that there are other consequences to the global climate in addition to rising temperatures. Other than water vapor, the primary GHGs contributing to global climate change include the following gases:

- CO_2, primarily a byproduct of fuel combustion;
- Nitrous oxide (N_2O), a byproduct of fuel combustion that is also associated with agricultural operations such as the fertilization of crops;
- CH_4, commonly created by off-gassing from agricultural practices (e.g., livestock), wastewater treatment, and landfill operations;

- Chlorofluorocarbons (CFCs), which were used as refrigerants, propellants, and cleaning solvents, although their production has been mostly prohibited by international treaty;
- Hydrofluorocarbons (HFCs), which are now widely used as a substitute for chlorofluorocarbons in refrigeration and cooling; and
- Perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6), emissions of which are commonly created by industries such as aluminum production and semiconductor manufacturing.

These gases vary considerably in terms of Global Warming Potential (GWP), a term developed to compare the propensity of each GHG to trap heat in the atmosphere relative to another GHG. GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and the length of time of gas remains in the atmosphere. The GWP of each GHG is measured relative to CO_2. Accordingly, GHG emissions are typically measured and reported in terms of CO_2 equivalent (CO_2e). For instance, sulfur hexafluoride (SF_6) is 22,800 times more intense in terms of global climate change contribution than CO_2.

Discussion

a) *Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*

GHG emissions associated with development of the proposed project would occur over the short term from construction activities, consisting primarily of emissions from equipment exhaust and worker and vendor trips. There would also be long-term operational emissions associated with vehicular traffic within the project vicinity, energy and water usage, and solid waste disposal. Emissions estimates for the proposed project are discussed below and were assessed using the methodology recommended in the BAAQMD's *CEQA Air Quality Guidelines* (BAAQMD, 2011).

Construction Impacts

Construction-period GHG emissions were calculated using the CalEEMod model developed by the South Coast Air Quality Management District with assistance from other air districts in California including the BAAQMD (SCAQMD, 2013).[7] Inputs to the model included project size, location, construction schedule, and proposed pieces of construction

[7] CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for lead agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operation from a variety of land use projects.

equipment for use supplied by the project applicant. The site is anticipated to have 1,200 tons of soil removed from it during the grading phase, and a maximum of 3,500 cubic yards of soil import and 3,500 cubic yards of soil export are anticipated during the proposed RAP work.[8]

GHG emissions associated with construction were computed to be 1164 metric tons (MT) of CO_2e over the entire construction period and 92 MT of CO_2e for RAP work only. Neither the BAAQMD nor the City of Novato has an adopted threshold of significance for construction-related GHG emissions, however, this would be well below the lowest project threshold of 1,100 MT of CO_2e annually established by BAAQMD and this impact is considered less than significant. The BAAQMD encourages the incorporation of best management practices (BMPs) to reduce GHG emissions during construction where feasible and applicable. BMPs may include, but are not limited to, using alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment for at least 15 percent of the fleet, using at least 10 percent local building materials, and recycling or reusing at least 50 percent of construction waste materials.

Operational Impacts

Due to the project size, operational-period GHG emissions would be less than significant. In its May 2011 update to the *CEQA Air Quality Guidelines*, the BAAQMD identified screening criteria for the sizes of land use projects that could result in significant GHG emissions. For operational impacts, the screening project size is identified at 78 dwelling units. Condominium/townhouse development projects of smaller size would be expected to have less-than-significant impacts with respect to operational period emissions. Since the project proposes 31 dwelling units, it is concluded that emissions would be below the BAAQMD significance threshold of 1,100 metric tons (MT) of CO_2e annually and, therefore, this impact is considered less than significant. Note that in developing thresholds of significance for GHG emissions, BAAQMD considered the emissions levels for which a project's individual emissions would be cumulatively considerable. Therefore, a project that has emissions below the significance threshold would not have a cumulative significant impact with respect to the environmental impact of global climate change.

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

Federal Regulations

The U.S. has historically had a voluntary approach to reducing GHG emissions. However, on April 2, 2007, the U.S. Supreme Court ruled that the United States Environmental Protection Agency (U.S. EPA) has the authority to regulate CO_2 emissions under the federal

[8] The Draft Rap estimates the soil export volume to be closer to 2,800 cubic yards; however, 3,500 cubic yards was used for the greenhouse gas emissions analysis as a more conservative estimate.

Clean Air Act (CAA). There are currently no federal regulations that apply to GHG emissions from construction or operation of the project.

State Regulations

The California Air Resources Board (CARB) is the lead agency for implementing climate change regulations in the State. Since its formation, CARB has worked with the public, the business sector, and local governments to find solutions to California's air pollution problems. Assembly Bill (AB) 32 and Senate Bill (SB) 375, discussed below, are the primary pieces of legislation regulating GHG emissions in the State; however, there are no State regulations that directly apply to the proposed project.

Assembly Bill 32 (2006), California Global Warming Solutions Act

AB 32 aims to reduce GHG emissions to 1990 levels by 2020. The CARB has established the level of GHG emissions in 1990 at 427 million metric tons (MMT) of CO_2e. The emissions target of 427 MMT requires the reduction of 169 MMT from the State's projected "business-as-usual" 2020 emissions of 596 MMT. On December 11, 2008, CARB approved a Scoping Plan that includes measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste (CARB, 2008).

Senate Bill 375 (2008)

SB 375 enhanced CARB's ability to reach AB 32 goals by developing regional GHG emissions reduction targets for automobiles and light trucks. CARB is working with California's 18 metropolitan planning organizations to align their regional transportation, housing, and land use plans and prepare "Sustainable Communities Strategies" to reduce the number of vehicle miles traveled and attain GHG reduction targets. In the Bay Area, the Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC) are fulfilling the "Sustainable Communities Strategy" requirement with the "Plan Bay Area."

Project Impacts

The adopted AB 32 Scoping Plan includes proposed GHG reductions from direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as cap-and-trade systems. The project would be subject to all applicable permit and planning requirements in place or adopted by the City of Novato or State of California (e.g., Title 24 California Building Standards); therefore, the proposed project would not conflict with plans or policies related to the reduction of GHG emissions.

Cumulative Impacts

Like air pollution, GHG emissions and global climate change also represent cumulative impacts. GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. Climate change impacts may include an increase in extreme heat days, higher concentrations of air pollutants, sea level rise, impacts on water supply and water quality, public health impacts, impacts on ecosystems, impacts on agriculture, and other environmental impacts. No single project could generate enough GHG emissions to noticeably change the global average temperature. The combination of GHG emissions from past, present, and future projects contributes substantially to the phenomenon of global climate change and its associated environmental impacts. However, the proposed would not contribute to any significant cumulative climate change impacts since project emissions would be below significance thresholds.

VIII. HAZARDS

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	❒	■	❒	❒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	❒	■	❒	❒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	❒	■	❒	❒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	❒	■	❒	❒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	❒	❒	❒	■
f) For a project located within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	❒	❒	❒	■
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	❒	❒	■	❒
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	❒	❒	❒	■

Affected Environment

Site History

The project site was the location of a former Naval Exchange (NEX) gas station, referred to by the Navy as Building 970. The Building 970 station operated from the mid-1970s through the early 1990s. After the station was closed, three 10,000-gallon underground storage tanks (USTs) formerly containing gasoline were removed in 1995 (Ninyo & Moore, 2008a).

Soil and groundwater samples collected during the tank removals indicated that releases of gasoline had occurred from the USTs during the station operation. The contaminants identified in these samples included the gasoline-related volatile organic compounds (VOCs) benzene, toluene, ethylbenzene, and xylenes (commonly referred to as BTEX), lead (an additive formerly used in leaded gasoline), and methyl-tert-butyl ether (MTBE, another common gasoline additive) (Ninyo & Moore, 2008a; Marin County, 2005).

An additional gasoline station, the Public Works Center (PWC) station, referred to as Building 957, was located on "C" Street approximately 700 feet north of the project site. The Building 957 station operated until 1992, when the station was closed and the USTs removed. Releases from USTs at the Building 957 station have also affected groundwater in the project vicinity. The groundwater contamination plume is classified as "commingled": due to the proximity of the sites, it is not possible to determine what portion of the groundwater contamination in the region originated from the Building 970 (NEX) station and what portion originated from the Building 957 (PWC) station. Accordingly, the regulatory cases for the two sites have been combined and the contamination is being investigated and remediated as the "Former UST Site 957/970". The releases from these USTs are being investigated and remediated by the Department of the Navy Base Realignment and Closure (BRAC) San Diego Program Management Office (PMO). The San Francisco Bay Regional Water Quality Control Board (Regional Water Board) is overseeing the process and issued Order 00-064 in 2000 establishing site cleanup requirements for the UST 957/970 site.

In June 1998, an air sparging and soil vapor extraction system was installed at the 957/970 site to address the areas of the highest groundwater contaminant concentrations. It was shut down in October 1999 when the effectiveness became diminished, after removal of significant mass of contaminants (Battelle, 2013).

Groundwater sampling during the 1990s and early 2000s showed marked decreases in most of the contaminants in groundwater (Battelle, 2013). The exception has been MTBE, which is more soluble in water and does not naturally degrade into harmless compounds as quickly as other gasoline constituents. Since 1999, remediation efforts at the 957/970 Site have focused on the MTBE contamination. The remedial goal for MTBE is 13 micrograms per liter (µg/L, or parts per billion), which is the Maximum Contaminant Level (MCL), a federal drinking water standard.

In September 2002, a biosparging treatment system was installed north of the project site to address the MTBE contaminant plume. It operated between September 2002 and March 2005, and between March 2006 and January 2009. It was formally shut down in 2010 after a review of groundwater data showed that the system was no longer removing significant amounts of MTBE (Battelle, 2013).

Recent sampling has determined that MTBE concentrations in groundwater near the former gasoline stations have markedly declined. However, the MTBE released at the site has migrated north, along with the natural flow of groundwater. Accordingly, concentrations of MTBE are increasing to the north of the project site. Investigation and remediation is now focused on addressing contamination on this "leading edge" of the groundwater plume, where the greatest groundwater MTBE concentrations are located. The location of the leading edge of the MTBE plume is currently a former military landfill, designated as Landfill 26, located approximately 0.5 miles north of the project site (Battelle, 2014). Between December 2010 and December 2011, an air sparging system operated in this leading edge area to treat groundwater. Follow-up monitoring in the leading edge area during 2012 and 2013 indicated that the treatment system had been effective and the treatment system was removed in November 2013. MTBE concentrations within the leading edge plume are expected to continue to decrease due to natural attenuation, as MTBE biodegrades and disperses over time (Battelle, 2014).

In 2005, a deed restriction was entered for the project site property to ensure that future land uses would not result in significant hazardous material exposures to future site users or interfere with the ongoing investigation and remediation of the project site and vicinity (Marin County, 2005). Restrictions on the project site include:

- The site may not be used for residential uses or other sensitive uses such as for a hospital, school, or daycare.
- Groundwater extraction or use is prohibited, except for current groundwater sampling.
- Any excavation that may encounter groundwater or require groundwater dewatering must be in accordance with a workplan approved by the Department of the Navy, Regional Water Board, and the Department of Toxic Substances Control (DTSC).
- Site development must not interfere with ongoing corrective actions.

Any uses outside of the deed restriction, such as residential redevelopment, would require a variance from the deed restriction. Deed restriction variance requests must be made in accordance with California Health and Safety Code Section 25233. A request for variance must be made to DTSC and the Regional Water Board. The applicant has the burden of proving that the variance will not cause or allow any of the following effects associated with contamination at the project site:

- The creation or increase of significant present or future hazards to public health.

- Any significant diminution of the ability to mitigate any significant potential or actual hazard to public health.

- Any long-term increase in the number of humans or animals exposed to significant hazards which affect the health, well-being, or safety of the public.

California Health and Safety Code Section 25234 allows for the deed restriction to be removed by the applicant, if either of the following can be demonstrated:

- The hazardous waste which caused the land to be restricted or designated has since been removed or altered in a manner which precludes any significant existing or potential hazard to present or future public health.

- New scientific evidence is available since the restriction or designation of the land or the making of any previous application pursuant to this section, concerning either the nature of the hazardous waste which caused the land to be designated or the geology or other physical environmental characteristics of the designated land.

Hazardous Materials Present at the Site

In 2005, a limited Phase II Environmental Site Assessment (ESA) was conducted to evaluate soil, soil gas, and groundwater conditions at the project site (Ninyo & Moore, 2008b). It included the installation of 25 soil borings, collection and analysis of soil samples from 24 locations, collection and analysis of soil gas from 10 locations, and groundwater samples from two locations. Documentation of this investigation was used as a basis for the following summary of existing site conditions. As this summary is based on samples collected in 2005, it likely overstates the concentrations of organic contaminants such as MTBE, which would have been expected to naturally lessen in the 11 years since the sampling.

Additional information about hazardous materials was collected from the Site 957/970 Groundwater Sampling Plan (Battelle, 2013), the summary of environmental investigations in the deed restriction recorded for the project site (Marin County, 2005), and a hazardous material building survey performed for the project site building (Ninyo & Moore, 2008c).

Soil

Approximately 400 cubic yards of contaminated soils at the project site were removed in 1995 and 1996, when the USTs were removed (Ninyo & Moore, 2008b). An additional 220 tons (approximately 200 cubic yards) of contaminated soils were removed during a separate interim remedial event in 2000, when hydraulic lifts, drain piping, and other features were removed from the interior of Building 970 (Ninyo & Moore, 2008b). However, 120 cubic yards of known contaminated soils remain left in place near the northern part of the Building 970 structure, as it was determined that removal of the soils could destabilize the foundation (Ninyo & Moore, 2008b).

Soils remaining at the site have been affected by a variety of petroleum-related contaminants. Many of those contaminants exceed Environmental Screening Levels (ESLs) established by the Regional Water Board.[9] To describe the worst-case conditions at the project site, the maximum contaminant concentrations at the site are presented in Table 5, below, along with the applicable ESLs. As ESLs are conservative, concentrations of contaminants exceeding the ESLs does not necessarily indicate that a health risk exists at a site, but ESLs are useful in identifying the contaminants of concern at a site that may potentially require remediation.

Groundwater

In the 2005 Phase II investigation, total petroleum hydrocarbons in the diesel range (TPH-d) was identified in one groundwater sample at 900 μg/L (above the ESL of 100 μg/L) (Table 5) and MTBE was identified in one sample at 1.5 μg/L, below the MCL of 13 μg/L. No other contaminants of concern were identified in the two groundwater samples collected and analyzed during the Phase II sampling activities (Ninyo & Moore, 2008b).

In November 2013, the date of the most recent groundwater information reviewed, groundwater samples from six wells at the project site were collected and analyzed for MTBE as part of sampling for the overall Site 957/970 groundwater monitoring program. The highest concentration identified at the project site was 55 μg/L from a well located adjacent to existing project site building (well MW-4A) (Battelle, 2014) (Table 5). Four other wells on the project site contained MTBE at concentrations ranging from 2.7 to 18 μg/L. One well in the southwest corner of the site (well 970-MW1), hydraulically downgradient from the former USTs, did not contain MTBE above the laboratory reporting limit of 0.25 μg/L. For comparison, the highest concentration measured at the entire Site 957/970 monitoring network during the November 2013 sampling event was 170 μg/L from a well at Landfill 26 (IT-GM-18), approximately 0.5 miles north of the project site (Battelle, 2014).

Twenty wells within the project site were removed in April 2015 in accordance with a permit approved by the Environmental Health Services Division of the Marin County Community Development Agency. A Well Destruction Plan (part of the Draft Removal Action Plan (RAP), discussed in more detail below) to remove these groundwater monitoring, sparge, and soil vapor extraction wells was reviewed and approved by the

[9] ESLs are conservative risk-based standards used for reviewing environmental sampling data to determine if additional investigation or analysis is warranted. ESLs are presented on Table VIII-1 as the Regional Water Board has been the lead agency for oversight of the project site. These ESLs were most recently updated in February 2016. DTSC often uses a similar set of screening levels on sites they oversee, called the California Human Health Screening Levels (CHHSLs).

TABLE 5 HAZARDOUS MATERIALS CONCENTRATIONS COMPARED TO REGIONAL WATER BOARD SCREENING LEVELS

Contaminant	Maximum from 2005 Phase II and 2011 Groundwater Investigations	Maximum from 2005 Deed Restriction Summary	Regional Water Board Screening Levels (Tier 1)
Soil			
Petroleum Hydrocarbons (TPH) in Soil (mg/kg)			
TPH as gasoline	17	260	100
TPH as diesel	2,700	8,000	240
TPH as motor oil	9,200	--	100
Total Oil and Grease	--	6,300	--
Volatile Organic Compounds in Soil (mg/kg)			
Benzene	0.33	--	0.044
Toluene	0.082	--	2.9
Ethylbenzene	0.79	--	1.4
Xylenes	3.1	--	2.3
MTBE	3.0	--	0.023
Metals in Soil (mg/kg)			
Lead	100	850	80
Groundwater			
Petroleum Hydrocarbons (TPH) in groundwater (µg/L)	900	--	100
MTBE in groundwater (µg/L)	55	--	5
Subslab and Soil Gases			
MTBE in soil gas (µg/m^3)	84,000	--	5,400
Benzene in soil gas (µg/m^3)	240	--	48

Notes: -- = not available. mg/kg = milligrams per kilogram (parts per million). µg/L = micrograms per liter (parts per billion). µg/m^3 = micrograms per cubic meter (conversion depends on contaminant, but generally 1 µg/m3 is less than 1 part per billion in air by volume). Only those compounds and classes of compounds associated with releases at the project site are presented on this table.
Sources: Ninyo & Moore, 2008b; Marin County, 2005; Battelle, 2013; Regional Water Board, 2016.

DTSC, Water Board, and the Navy (Battelle, 2015). Most of these wells were no longer in use, though the Draft RAP includes the replacement of three groundwater monitoring wells in the current MTBE groundwater monitoring well network after remediation at the project site is completed.

Soil Gas

Ten soil gas samples were collected during the 2005 Phase II and analyzed for volatile organic compounds. The results were compared against the Regional Water Board's Shallow Soil Gas Screening Levels for Evaluation of Vapor Intrusion Concerns. One sample from the northeast section of the project site contained MTBE at 84,000 micrograms per cubic meter ($\mu g/m^3$), exceeding the residential screening level of 4,700 $\mu g/m^3$. Three samples in the eastern half of the project site contained benzene at concentrations ranging from 44 to 240 $\mu g/m^3$, above the residential screening level of 42 $\mu g/m^3$ (Table 3); all other results were below the screening levels (Ninyo & Moore, 2008b).

Building Materials

The former gasoline station building at the project site was constructed in the 1970s. Prior to 1978, lead compounds were commonly used in exterior and interior paints. Lead is a suspected human carcinogen (i.e., may cause cancer), a known teratogen (i.e., causes birth defects), and a reproductive toxin (i.e., can cause sterility). Prior to the 1980s, building materials often contained asbestos fibers, which are a known human carcinogen. Asbestos, used to provide strength and fire resistance, was frequently incorporated into insulation, roofing, and siding, textured paint and patching compounds used on wall and ceiling joints, vinyl floor tiles and adhesives, and water and steam pipes.

ACBM surveys at the project site building were conducted by the Navy in 1998 and 2003. These surveys, which were limited to materials in below-ceiling parts of the building, identified asbestos or suspected asbestos in flooring and ceiling materials, hot water line insulation, tile grout, and exterior stucco (Ninyo & Moore, 2008c). In 2008, an additional survey was conducted to verify Navy findings and collect samples from materials not previously surveyed, such as roofing materials and paints. The 2008 survey included the collection and analysis of 25 building material samples for asbestos and 7 paint chip samples for total lead.

The 2008 survey confirmed the presence of asbestos in flooring materials and identified additional asbestos containing materials in roofing materials (Ninyo & Moore, 2008c). One of the seven paint chip samples contained lead above U.S. Department of Housing and Urban Development (HUD) threshold of 5,000 milligrams per kilogram (mg/kg, equivalent to parts per million) for LBP, and the other six samples contained concentrations of lead below that threshold, but at concentrations that would require special construction worker health and safety provisions during building demolition (Ninyo & Moore, 2008c). This LBP and lead-containing paint would only require abatement prior to demolition if it were peeling or in poor condition and could release lead dust particles during demolition.

Asbestos abatement was performed by a certified asbestos contractor and the gasoline station building was demolished in 2015 under permits issued by the BAAQMD (addressing compliance with state laws applicable to the conduct of demolitions involving materials with asbestos/lead) and by the City of Novato (acknowledging the removal of a structure); the City's approval of the demolition permit was contingent upon delivery of a permit ("J Number") from the BAAQMD. During later review of the RAP, discussed below, it was noted that the bathrooms in the former gas station building were inaccessible and therefore these areas were not sampled prior to demolition as part of the 2008 survey. If asbestos or lead were present in the bathroom building materials, they may have been dispersed into the environment during the building demolition.

To address this potential concern, the bathroom ceramic tile and mastic, fragments of which are still present on the building foundation, were surveyed for ACBMs and LBP in February 2016. Five samples of the tile and mastic were collected and analyzed for asbestos and an additional sample of the tile was analyzed for total lead. None of the samples contained asbestos above laboratory reporting limits, and the sample analyzed for lead had a concentration of 11 mg/kg, well below the HUD LBP threshold (Micro Analytical Laboratories, 2016). Based on this data, it appears unlikely that lead or asbestos were present in the building bathrooms prior to demolition.

Proposed Remedial Activities at the Site

The applicant has prepared a Draft RAP for the project site (West Yost Associates, 2015). The Draft RAP describes remedial activities that will be undertaken by the applicant under the oversight of the Regional Water Board and DTSC. In October 2015, the Draft RAP was released for a 30-day public comment period, which ended November 13, 2015. Based on review of the public comments, the Regional Water Board conditionally concurred the Draft RAP is acceptable in February 2016, subject to incorporation of specific changes regarding fugitive dust, air monitoring, asbestos and lead, and post-excavation soil sampling. In accordance with the Regional Water Board's conditional concurrence, the Final RAP will be approved once those changes have been made and this CEQA document has received City approval.

The Final RAP, as may be approved by the Regional Water Board and DTSC, will be used to guide the remediation at the site. After the remediation has been completed and it has been determined that the objectives of the RAP have been achieved, the Regional Water Board and DTSC will issue a certification that the remedial action is complete. After completion of the remedial action, the applicant proposes to have the current deed restriction removed in accordance with California Health and Safety Code Section 25234, which would allow residential and other sensitive land uses at the project site. Besides residences, sensitive land uses could include schools, hospitals, senior centers, and other uses where populations such as children, the elderly, and the infirm, who are often more sensitive to health effects from hazardous materials than the general population. The deed restriction must be removed before the City considers the development entitlements required for the project.

The Draft RAP for the project site consists of the following components:

Excavation. Soils near and beneath the former gas station at the project site containing petroleum contamination will be removed from the site. It is anticipated that approximately 2,800 cubic yards of soils to a depth of approximately 7 to 10 feet will be removed. Field screening will be performed during excavation using a photoionization detector and a mobile laboratory to assist in determining the depth of excavation required.

All excavation activities will be conducted in accordance with the site-specific Soil Management Plan (SMP). The SMP describes the measures to make sure that contaminated materials are handled during remediation in accordance with regulatory requirements and in a manner that does not create potential health risks to construction workers and nearby members of the general public. The SMP designates specific responsibilities to the remediation field coordinator, remediation project manager, and general contractor. Major components of the SMP are described below.

- **Health and Safety Plan**. A Health and Safety Plan (HSP) has been prepared and is included in the SMP. It requires that all site workers must be trained in Hazardous Waste Operations and Emergency Response (HAZWOPER) in accordance with OSHA requirements. It also designates required personal protective equipment for workers, decontamination procedures, and an emergency response plan.

- **Air Monitoring.** The SMP describes the real-time air monitoring and perimeter air monitoring that will be conducted during remedial activities. Real-time monitoring, intended to protect remedial workers, will include monitoring of organic vapors and gases at the level of the excavated material and within the breathing space of remedial workers. At a minimum, the real-time monitoring will be conducted at 15-minute intervals whenever work begins on a different part of the project site, when contaminants other than those previously identified are being handled, when a different type of operation is initiated, and if a sufficient reasonable interval has passed so that exposures may have significantly increased. This monitoring will be conducted under the direction of a designated SMP field coordinator, who has the authority to increase or modify the monitoring activities and is responsible for interpreting the results. The field coordinator must verify that the monitoring is adequate to assess the level of remedial workers' exposures and that respiratory protection and work zone designations are adequate to protect the worker's health. The field coordinator is responsible for changing work practices as needed, such as requiring additional respiratory protection or otherwise changing work practices to reduce potential exposures. The field coordinator will maintain a log containing all air monitoring readings, equipment calibration and maintenance, and changes to the level of worker protection.

Perimeter monitoring proposed in the SMP, intended to protect off-site members of the general public, includes monitoring of organic vapors at least two times per day both upwind and downwind of the perimeter of the site. If downwind organic vapor measurements exceed the upwind measurements by more than five parts per million (ppm), work will be stopped, the excavation area will be covered to eliminate emissions, and work will not resume until it is determined how to safely proceed with the work and more fully characterize the downwind airborne emissions.

In their February 2016 conditional concurrence, the Regional Water Board required that additional details regarding air monitoring be included in the Final RAP. This will include, but not be limited to, the specific contaminants to be monitored, monitoring equipment, locations, frequency, responsible parties, corrective action measures in the event of an exceedance, and contingency plans if monitoring equipment fails. Performance standards for air monitoring and other provisions to protect off-site receptors from emissions during remedial activities have been included in **Mitigation Measure HAZ-1b**, below.

- **Pre-Excavation Soil Characterization.** Soil samples will be collected and analyzed from ten exploratory potholes to characterize the soils prior to excavation. As 2,800 cubic yards of soil are anticipated to be excavated, this represents one soil sample per 280 cubic yards of material. The laboratory results will be used to satisfy disposal requirements for the Potrero Hills Landfill in Suisun City and B&J Landfill in Vacaville so that excavated soil can be loaded directly onto trucks and does not have to be stockpiled on-site prior to off-site transport.

- **Soil Loading, Transport, and Disposal Requirements.** The SMP requires soil loaded on trucks to be covered with tarps and loose soil brushed from tires and truck bodies so that contaminated soils are not spilled during transport.

- **Site Control Measures.** The site will be monitored for dust and odors, and work will be halted if average wind speeds exceed 20 mph or if fugitive dust is observed to be migrating off-site. Any groundwater encountered will be pumped into a holding tank, analyzed for contaminant concentrations to determine proper disposal options, and removed by an appropriate disposal company. Stormwater control measures will be implemented to prevent contaminated soils from being entrained in storm water runoff and migrating from the site.

- **Management of Previously Unknown Contamination.** Should unanticipated contaminated soil or a subsurface feature such as an underground storage tank be encountered during the remedial work, appropriate agencies will be notified as required, and sampling will be performed to evaluate the extent and magnitude of the contamination in accordance with procedures in the Sampling and Analysis Plan (SAP), described in more detail below.

The SMP is part of the RAP and a final SMP must be approved by the Regional Water Board and DTSC prior to the beginning of the remedial work.

Confirmation Sampling and Backfilling. Although screening during excavation using field testing equipment is intended to ensure that all affected soils are removed during the initial excavation, confirmation sampling will be performed. A draft SAP has been prepared which describes the testing that will be completed after the excavation to verify that all soils containing contaminants above residential land use screening levels have been removed. The SAP divided the remediation areas into 18 decision unit (DU) areas. Post-excavation soil samples will be collected from 45 locations within the DUs and analyzed for contaminants of concern. Only after it has been verified that all soils with contaminants exceeding residential land use thresholds have been removed will the excavations be backfilled with clean soils.

The SAP is part of the RAP and a final SAP must be approved by the Regional Water Board and DTSC prior to the beginning of the remedial work.

Monitoring Well Replacement. Following confirmation sampling and backfilling, groundwater monitoring wells will be installed for the ongoing Navy base-wide groundwater monitoring program. It is anticipated that three monitoring wells will be installed.

Human Health Risk Assessment. A Human Health Risk Assessment (HHRA), including analysis of post-remedial soil and soil vapor samples, will be conducted concurrently with monitoring well replacement. The HHRA is intended to demonstrate that the RAP has been successful and the project site is appropriate for residential development.

Post-RAP Actions

The applicant intends to petition the Navy, DTSC, and the Regional Water Board to remove the deed restriction at the project site. In accordance with California Health and Safety Code Section 25234, the applicant must demonstrate that hazardous materials at the site have been removed or altered to preclude any significant existing or potential future hazard to public health.

Discussion

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less than Significant with Mitigation Incorporated. During proposed remedial activities, there may be a potential for contaminated soils to be released to the air as fugitive dust, which could potentially pose a health risk to construction workers and nearby members of the general public, including children at the North Bay Children's Center, Wonder Nook Preschool at Lanham Village, Novato Charter School, and Hamilton Elementary School. Children are considered sensitive receptors because, due to their size and stage of development, they are potentially more sensitive to the effects of hazardous materials than the general public.

The RAP for the project includes an SMP that specifies health and safety, dust control, and air monitoring provisions that would reduce the risk to workers and the general public to a less-than-significant level. However, the City has opted to develop mitigation measures that are consistent with and in some instances exceed the requirements of the RAP to maximize oversight for the remediation activities and improve the margins of safety for the general public, including nearby sensitive receptors. The implementation of **Mitigation Measures HAZ-1a** through **HAZ-1g**, below would ensure that the SMP provisions are incorporated into the project and additional monitoring is performed during remediation activities to ensure that sensitive receptors near the project site are not affected.

During construction of the project, hazardous materials such as fuel, lubricants, paint, sealants, and adhesives would be transported and used at the project site. As the project site is greater than one acre in area, management of these materials at the project site during construction would be subject to the requirements of the Construction General Stormwater Permit (CGP), discussed in more detail under the Hydrology section of this Initial Study. Compliance with the CGP would require preparation and implementation of a SWPPP designed to reduce the risk of spills or leaks from reaching the environment, including procedures to address minor spills of hazardous materials.

The proposed project involves residential land uses. This type of land use typically does not involve transport, use, or disposal of significant quantities of hazardous materials. Generally, small quantities of hazardous materials, such as paints, cleaning chemicals, and fertilizers, would be used for routine maintenance and landscaping. Existing hazardous materials programs overseen by the Marin County Certified Unified Program Agency (CUPA) would apply to any significant transport, use, or disposal of hazardous materials that might occur during project operations. These existing programs would ensure protection of human health and the environment. Therefore, no significant impact related to routine hazardous materials transport, use, or disposal during project operation would be expected.

Mitigation Measure HAZ-1: The following seven-part mitigation measure would reduce potential impacts of routine hazardous materials transportation, use, or disposal during remedial activities at the project site to a less-than-significant level:

HAZ-1a: Prior to the City issuing any permits for remediation activity at the site, the applicant shall provide the City with written documentation from the Regional Water Board and/or DTSC that the RAP, including a final SMP and SAP, has been approved.

HAZ-1b: Prior to the City issuing any permits for remediation activities at the site, the City shall contract with an independent, qualified environmental monitor, at the applicant's expense, to prepare a comprehensive safety and monitoring program and to be present at the site during all remedial activities. The environmental monitor shall prepare a safety and monitoring plan and conduct remediation monitoring which meets the following minimum requirements, subject to the review and approval by the Regional Water Board, DTSC, and the City of Novato:

a. The monitor will develop a comprehensive monitoring plan detailing actions required during remediation to protect off-site receptors from contaminants potentially released during excavation and other earthmoving activities. At a minimum, the safety and monitoring plan shall address:

1. The installation and maintenance of pre-remediation safety measures, including, but not limited to, placing plastic sheeting or other acceptable barriers over outdoor eating surfaces, play equipment and vegetable beds at the North Bay Children's Center, Novato Charter School, Wonder Nook Preschool, the community garden at Lanham Village, and Hamilton Elementary School prior to the start of each weekend work session;
2. Monitoring of the third party dust control subcontractor (Mitigation Measure HAZ-1d) to insure implementation, at a minimum, of the dust and odor control measures specified in Mitigation Measure AIR-1 and the measures specified in the RAP (see SMP - Section 6.4.1) during any remediation activities (weekends only; see HAZ-1c below) and over the weekdays between remediation work periods. The third party dust control subcontractor shall also ensure: a) water for dust control is monitored to ensure an application rate that prevents runoff to off-site locations, discharge to storm drain, or any nearby water features (e.g., Pacheco Creek); and b) tarps are placed over all excavation pits after the completion of each day's remediation activities.
3. Implementation of the groundwater control and disposal and storm water pollution prevention protocols specified in the RAP (see SMP Sections 6.4.6 and

6.4.7) and Mitigation Measure HYD-1 (discussed below) during the remedial phase.

4. Specifications for the application of non-toxic VOC vapor suppressants during soil excavation and hauling, including application to excavation sidewalls and pits during non-construction hours.

5. The establishment and implementation of perimeter air monitoring protocols for lead and other heavy metals, asbestos, particulate matter, and organic vapor consistent with monitoring provisions specified in the RAP (see SMP Section 6.4.2), including the addition of the following supplemental provisions:

   i) Upwind and downwind sampling stations along the site perimeter that shall be active during all remedial earthmoving work and require results to be compared daily to background levels (measured prior to construction as part of the monitoring plan) to evaluate the effectiveness of the engineering and dust control measures implemented during remedial activities;

   ii) Monitoring equipment shall include an anemometer and wind vane to establish wind speed and direction, real-time particulate monitors (Met One E-BAM or equivalent), lead and asbestos air samplers (BGI PQ100 or equivalent), real-time photoionization organic vapor detectors (RAE UltraRAE 3000 or equivalent), and an X-ray fluorescence (XRF) analyzer to determine the presence of heavy metal contaminants in air particulate samples.

   iii) Particulate matter and organic vapor shall be monitored in real time, while two perimeter heavy metals (Title 22 list) and asbestos samples shall be collected during each day's remedial activities using methodology designed to represent the worst-case exposures for that work day. The heavy metals and asbestos samples shall be analyzed using the quickest available laboratory turnaround time.

6. The environmental monitor shall make provisions to maintain an inventory of back-up monitoring and testing equipment at the project site during remedial activities. Should monitoring equipment fail and a replacement device(s) is not immediately available then all remedial work shall be stopped pending replacement of the monitoring equipment.

7. The establishment of perimeter action levels for lead, asbestos, heavy metals, particulate matter, and organic vapor to be protective of human health and the environment, based on established health and safety standards. The following minimum action levels shall be included in the monitoring plan:

i) For lead and particulate matter, action levels shall be the strictest ambient air standard from U.S. EPA or the BAAQMD: 0.15 μg/m3 for lead and 20 μg/m3 for particulate matter (as PM10) measured at downwind locations. With the exception of lead, no ambient air quality standards have been established for heavy metals. Accordingly, any exceedance of perimeter heavy metals concentrations above background levels (measured before remedial activities at the upwind and downwind perimeter locations specified in the environmental monitoring plan) shall also represent an exceedance under the monitoring plan.

ii) No ambient air quality standards have been established for asbestos. Accordingly, any exceedance of perimeter asbestos above background levels (measured before remedial activities at the upwind and downwind perimeter locations specified in the environmental monitoring plan) shall represent an exceedance under the monitoring plan.

iii) No ambient air quality standards have been established for organic vapor. Accordingly, any exceedance of perimeter organic vapor above background levels (measured before remedial activities) measured at downwind locations shall represent an exceedance under the monitoring plan.

8. The assignment of specific corrective measures/procedures to be implemented if a perimeter action level is exceeded during remedial activities. If a perimeter action level is exceeded, the environmental monitor shall stop all work, assess the problem, and direct corrective action(s). Corrective actions may include, but are not limited to: increasing the frequency of dust control measures, modifying dust control procedures, changing soil removal procedures, and/or directing the use of alternate construction equipment or methods. The environmental monitor shall recheck perimeter air monitoring levels to determine if the selected corrective actions have been effective.

9. The development of emergency response protocols to be implemented should there be an accidental release of contaminated soil and/or groundwater or a dust control problem, that in the opinion of the environmental monitor, City, Regional Water Board, or DTSC, represents an immediate threat to the public or causing contamination of an off-site location warranting the immediate notification of representatives of Lanham Village, the Director of the Novato Charter School, the Director of the North Bay Children's Center, the Superintendent of the Novato Unified School District, and the City's Community Development Director. The emergency response protocols must specify the channels of communication through which notification and safety guidance will be delivered and establish directives for each organization to advise their respective stakeholders (e.g., parents, residents) of the emergency situation.

10. The development and implementation of post-remediation work hygiene protocols, including, but not limited to, the proper removal of plastic sheeting or other barriers placed over outdoor eating surfaces, play equipment, and vegetable beds at the North Bay Children's Center, Novato Charter School, Wonder Nook Preschool, the community garden at Lanham Village, and Hamilton Elementary School and the wiping down of all outdoor eating surfaces and play equipment at the noted children's facilities. The post-remediation hygiene protocol shall be conducted at the close of each weekend work period.
11. The establishment of procedures addressing the notification and identification of unknown environmental features (e.g., stained or odorous soil, tanks, etc.). At a minimum, the monitoring plan shall incorporate such procedures from the RAP with the added conditions of requiring notification of the City of Novato, Regional Water Board, and any other agency with potential jurisdiction over the environmental feature.

b. The environmental monitor shall be present during all remediation work to ensure all components of the safety and monitoring plan and final RAP are implemented and maintained throughout the remediation phase. At a minimum, the environmental monitor shall perform the following activities:

1. The environmental monitor shall be responsible for reporting directly to the City and shall have the authority to: a) direct the start of each remediation work day after confirming implementation of all pre-remediation safety measures; b) direct corrective action to maintain compliance with the monitoring plan; c) stop work at the project site for any violation of the monitoring plan protocols or an exceedance of the perimeter contaminant threshold(s) established in the monitoring plan; and d) monitor and confirm compliance with post-remediation work hygiene procedures and release of remediation personnel once such work is deemed complete. The applicant and its remediation contractor/subcontractors shall acknowledge and agree in writing that the environmental monitor has such authorities and will not be obstructed from exercising oversight and direction relating to the monitoring of the remediation phase.
2. The environmental monitor shall maintain a log of the events of each remediation workday, including the results of air monitoring readings as required by the SMP (see SMP Section 6.4.5) and provide a report to the Community Development Director, the Regional Water Board, and Department of Toxic Substances Control regarding compliance with the monitoring plan and testing results.
3. The environmental monitor shall observe and ensure the proper removal and disposal of any floor tiles or remnants thereof affixed to or visible in the

vicinity of the foundation slab of the former gas station at the project site. The removal and disposal shall be conducted in accordance with Cal/OSHA Construction Safety Orders for Lead (Title 8, California Code of Regulations, Section 1532.1). The removal process shall be completed prior to the initiation of other remedial activities at the project site to avoid pulverizing the tile.

HAZ-1c: Excavation, grading, loading, and off-hauling of any contaminated soils during the remediation phase of the project or any subsequent remedial activities shall only be conducted on Saturdays and Sundays when children are not present at the North Bay Children's Center, Novato Charter School, Wonder Nook Preschool, and Hamilton Elementary School. The acceptable hours of operation for such weekend work shall be 10 a.m. to 5 p.m. with permission to perform remediation activities on Sundays granted by the Community Development Director pursuant to Novato Municipal Code Section 19.22.070, as discussed in the Noise Section of the IS/MND.

HAZ-1d: The applicant shall contract with a third-party dust control subcontractor whose sole responsibility is to implement the dust control procedures specified in Mitigation Measure AIR-1 and the RAP. The dust control subcontractor shall ensure adequate equipment and water supplies are available prior to the start of work and at all times during the remediation phase to properly suppress dust. The dust control subcontractor shall be subject to oversight by the environmental monitor (Mitigation Measure Haz-1b) who has authority to direct corrective actions to ensure proper dust suppression. Such authority shall be confirmed in the contract between the applicant and said dust control contractor.

HAZ-1e: A public notice shall be mailed by the City on behalf of the applicant to all property owners of record within a 1,000-foot radius of the project site and operators of all facilities serving children within this radius announcing the date of initiation of remediation activities. Said notice shall include contact information for the environmental monitor required by Mitigation Measure Haz-1b. The notice shall also list contact numbers of representatives of the applicant, the remediation contractor, the City of Novato, the BAAQMD, the Regional Water Board, and DTSC. Said notice shall be mailed no less than thirty (30) calendar days before the scheduled initiation of remediation activities.

HAZ-1f: The applicant shall post signs at the project site, North Bay Children's Center, Hamilton Elementary School, Novato Charter School, Wonder Nook Preschool, the community garden at Lanham Village, and the South Novato Library advising of the dates that remediation work will occur and listing contact information for: the applicant's representative, the City of Novato, the BAAQMD, the Regional Water Board, DTSC, and the project's environmental monitor. The text of the signs shall be submitted to the Community Development Director for review and approval. Signs shall be posted no less than thirty (30) calendar days prior to the scheduled initiation of remediation activities and shall remain in place throughout the remediation phase.

HAZ-1g: The applicant shall conduct a post-remediation human health risk assessment (HHRA) as specified in the RAP to evaluate the post-remediation concentrations of soil, groundwater, and soil vapor contaminants at the site, including testing of any locations where soils not removed during remediation activities were previously found to contain contaminant concentrations above Regional Water Board Environmental Screening Levels for residential land uses. The HHRA shall be reviewed by the DTSC.

b) *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*

Less Than Significant with Mitigation Incorporated. Project construction activities would include the use of hazardous materials such as motor fuels, oils, solvents, and lubricants. An accidental release of hazardous materials during fueling, maintenance, or improper operation of construction equipment could potentially occur and pose a risk to construction workers, the public, and the environment.

Soils, groundwater, and soil gases at the project site contain contaminants as a result of releases of petroleum products from the former gasoline station at the site. Remediation of the project would require disturbance of hazardous materials in soil and building materials. Remedial workers would come into direct contact with these contaminants, and the contaminants could migrate via fugitive dust and affect nearby members of the general public. Should remedial action not remove all significant health risks from contaminants, future construction workers, site residents, and maintenance workers could be exposed to contaminants currently present in soil, soil gas, and groundwater.

Remedial workers would be protected through implementation of health and safety measures in the project RAP and SMP, which would be implemented and verified through **Mitigation Measures HAZ-1a** through **HAZ-1g**. Once the remediation has been completed, the soil vapor sampling and health risk assessment performed, and the remedial action certified by the Regional Water Board and DTSC, hazardous materials at the project site potentially affecting human health and the environment will have been removed from the site. Should the post-remedial health risk assessment identify the need for additional remedial action to eliminate health risks prior to certification, those subsequent remedial activities would be considered part of the project and would be subject to Mitigation Measures HAZ-1a through HAZ-1g.

Proving that all hazardous materials creating health risks have been removed would also allow the project site deed restriction to be removed in accordance with California Health and Safety Code Section 25234. The following mitigation measures would ensure that this potential impact is reduced to a less-than-significant level:

> Mitigation Measure HAZ-2: Prior to the City considering approval of the proposed amendments to the General Plan, Master (Reuse) Plan, or Zoning that would allow residential uses, the applicant shall provide the City with the Certificate of Completion for the RAP for the site, issued by the Regional Water Board and/or DTSC and the Notice of Release or other appropriate instrument on the deed restriction as issued by the Department of the Navy that shows the deed restriction has been removed.

c) *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*

Less Than Significant with Mitigation Incorporated. The project site is adjacent to the North Bay Children's Center, the Hamilton Elementary School, the Novato Charter School, Wonder Nook Preschool, and a vacant Novato Unified School District property. Releases of hazardous materials from contaminated soil during remedial activities could potentially migrate and affect the schools, but implementation of safety measures in the RAP and SMP, as modified by **Mitigation Measures HAZ-1a** through **HAZ-1g**, would reduce these impacts during remedial activities to a less-than-significant level. No additional mitigation is required.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Less Than Significant with Mitigation Incorporated. As discussed in the Affected Environment Section, the project is listed on government hazardous material site databases due to releases from the former USTs at the project site. The residual contamination currently present at the site has the potential to create a significant hazard to the public and/or environment, but completion of the proposed remediation, through implementation of the RAP and SMP required by **Mitigation Measures HAZ-1a,** through **HAZ-1g,** and **HAZ-2** would reduce these impacts to a less-than-significant level. No additional mitigation is required.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The nearest public airport is the Marin County Airport (formerly Gnoss Field), located approximately 5 miles north of the project site. The nearest private airfield is the San Rafael Airport, located approximately 5 miles to the south. Based on these distances, no impact related to aviation hazards would be expected.

f) For a project located within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No Impact. Based on a review of mapped airport locations, there are no private airstrips in the vicinity of the project site. The project would have no impact on public safety related to aviation hazards around private airstrips.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less than Significant. The project would not interfere with existing vehicular or pedestrian traffic in the project vicinity. In accordance with City permit requirements, subdivision plans would be reviewed by the Novato Fire Protection District to ensure that streets meet requirements for emergency vehicle access. No significant impact to emergency response and action plans would be expected.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

No Impact. The project site is surrounded by urban development and not located in or adjacent to a wildland area. No impact associated with wildfire hazards would be expected.

Cumulative Impacts

The potential cumulative risk of exposure to contaminated soils and groundwater is not an issue for which there are established thresholds of exposure or methodologies to develop a cumulative human health risk profile, such as excess cases of cancer. Given this circumstance, it was determined that cumulative risk in this instance would be qualitatively analyzed by considering projects in the vicinity of the Main Gate site that could have grading and demolition activities occurring concurrently with the remedial activities at the project site and that have potential to release dust containing soil contaminants, involve the handling and disposal of building materials containing lead and/or asbestos, and/or the possibility of contacting contaminated groundwater. If a combination of planned or proposed projects could result in releases of hazardous materials to the environment that could expose members of the general public to hazardous materials at concentrations exceeding established health risk levels, it would be determined that the project contributes to a cumulative impact related to hazardous materials.

There are currently five (5) projects in the project vicinity of the project site that are either under construction, in pre-construction building permit review, or undergoing development review with the city. These projects are described below, including name, location relative to the project site, approval status, and timing of construction.

Sonoma-Marin Area Rail Transit - Hamilton Station. The Sonoma-Marin Rail Transit District (SMART) is in the process of constructing the Hamilton Station (approximately 600-feet east of the Main Gate project site). SMART is scheduled to have the Hamilton Station fully constructed and operating by fall 2016.

The Hamilton Station was analyzed in the Supplemental Environmental Impact Report (EIR) for the Sonoma Marin Area Rail Transit Project. This EIR did not identify any soil contamination at the Hamilton Station site. No building demolition was conducted or is proposed to construct the Hamilton Station.

801 State Access Senior Apartments. This project has received City entitlements to construct a 48-unit apartment complex for senior-aged residents at 801 State Access Road (approximately 900-feet north of the project site). The project's construction detail drawings are being reviewed by the City based on an application for a building permit. Construction of this project could commence in late summer 2016.

The project would involve the demolition of a former military warehouse of 9,000 square feet. This warehouse has been assessed for building-related hazardous materials, including PCBs, asbestos, and lead paint. The assessments concluded PCBs and asbestos are not present in the building. Paint chips containing lead were found at the perimeter of the building.

The project site contains an "Area of Environmental Restriction" that is subject of restrictive deed covenants due to the presence of groundwater contaminated by MTBE that migrated from the former gas station at the project site. This "Area of Environmental Restriction" will be improved with a parking lot. Excavations for the parking lot are not expected to reach ground water depths at the site. No soil is planned to be removed from the site.

An Initial Study/Mitigated Negative Declaration (IS/MND) was adopted for the project. The IS/MND recommended mitigation measures to control dust during construction and demolition and requires the preparation of a soil and groundwater management plan to address the possibility of encountering contaminated groundwater and soil containing lead-based paint. The mitigation measures were adopted as conditions of approval for the project. The developer is in the process of having an environmental remediation consultant prepare the soil and groundwater management plan, which will address the treatment of contaminated groundwater, if unexpectedly encountered, and the removal of lead-based paint at the perimeter of the existing warehouse building prior to demolition. The soil and groundwater management plan will be reviewed by the DTSC and Navy (former owner of the site).

Hamilton Hospital Residential Senior Assisted Living Facility. This project involves the rehabilitation and expansion of the historic Hamilton Hospital for use as an 80-room assisted living and memory care facility. This site is located at 516 Hospital Drive (approximately 2,100 feet east of the project site). The project has received City approvals and is awaiting a final review of architectural and landscaping details by the Novato Design Review Commission. Once this review is complete the project would advance to the building permit phase. The developer has not specified a time frame for completing the remaining Design Review component and subsequent building permit phase. However, City staff expects the project to be ready for construction in Spring 2017.

The Hamilton Hospital project involves demolition of portions of the existing hospital building. This building is known to contain building materials containing asbestos and lead-based paint. There is also suspicion that electrical transformers containing PCBs may be located in the building's basement.

An IS/MND was adopted for the project. The IS/MND recommended mitigation measures to control dust during construction, re-inspection of the building's basement for any PCB containing electrical transformers, and the development of a work plan and monitoring program addressing asbestos, lead, and PCBs (if located in the basement) to insure the removal and disposal of these hazards in a manner that is protective of both workers performing the work and members of the public. The mitigation measures were adopted as conditions of approval for the project.

Hamilton Cottages. This proposal involves a request for entitlements to construct sixteen (16) single-family residences on a 1.5-acre parcel located approximately 780-feet northeast of the project site. The project is currently undergoing environmental review and is expected to be considered by the Novato City Council in September 2016. If the project is ultimately approved, construction would likely commence in Spring 2017 at the earliest. The project site is not subject to any open or closed hazardous materials investigations. The project site does not contain any structures requiring demolition. An initial study is under review for the project.

Hamilton Fields. Hamilton Fields involves the proposed construction and operation of a private athletic sports facility on a 47-acre parcel (approximately 1,600 feet north of the project site). The parcel is a former military landfill that has been capped.

The City currently has an open application for Design Review and is in the early stages of considering the proposal's site design. The developer has offered various concept designs and has not arrived at a conclusive design for which development entitlements will be sought. The project will require an environmental impact report (EIR). The entitlement and environmental review phase for this project is expect to take from 18- to 24-months. If approved, construction could occur as early as Spring 2019. City staff views this project as being speculative.

As of July 18, 2016, the application filed by the Marin Sports Academy for the Hamilton Fields project in March 2015 has been withdrawn and closed at the request of the applicants, Marin Sports Academy LLC. This means that there is no application being processed by the City for this project.

Of the projects listed above, it is possible the 801 State Access Senior Apartments ("Senior Apartments") and SMART's Hamilton Rail Station could be under construction during the remedial phase of the Main Gate project which is expected to occur in 2016. The construction activities at the Hamilton Station site coupled with remedial activities at the project site would not cumulatively increase the risk of exposure to hazardous materials, as the Hamilton Station site is not affected by soil contamination, lead or asbestos, or groundwater contaminants.

The demolition and construction activities at the 801 State Access Senior Apartments coupled with the remedial activities at the project site would also not be expected to cause a cumulatively significant increase in the risk of exposure to hazardous materials since adequate mitigation measures have been developed to prevent the release of contaminants beyond the site perimeters in the form of dust or groundwater exposure at each project site. In particular, each project would be subject to implementing dust control measures as recommended by the BAAQMD, with the Main Gate project being subject to more exhaustive monitoring procedures due to the extensive level of soil contamination at the site and proximity to facilities hosting children. With respect to groundwater contamination, the 801 State Access Senior Apartments and Main Gate projects are not anticipated to have excavations that would expose and potentially release contaminated groundwater. The probability of both sites simultaneously contacting and exposing contaminated ground water is considered low. Despite the low risk, each project will be subject to groundwater management plans specifying the measures to be implemented should groundwater be unexpectedly encountered. At a minimum, these measures will include specific steps to contain groundwater on the respective project site, testing to characterize any contaminants, and proper disposal procedures (e.g., placement in tanks to transport to a licensed disposal facility).

Based on this analysis, implementation of the proposed project would not contribute to any potentially significant cumulative impacts related to hazardous materials.

IX. HYDROLOGY AND WATER QUALITY	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	❒	■	❒	❒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	❒	❒	■	❒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	❒	❒	■	❒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	❒	❒	■	❒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	❒	❒	■	❒
f) Otherwise substantially degrade water quality?	❒	■	❒	❒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	❒	■	❒	❒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	❒	❒	■	❒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding of as a result of the failure of a levee or dam?	❒	❒	❒	■
j) Inundation by seiche, tsunami, or mudflow?	❒	❒	❒	■

Affected Environment

Information regarding hydrology and water quality for the project is based on a geotechnical report conducted for the project site in 2007 (Miller Pacific, 2007), environmental investigations for the project site and vicinity, and available public agency hydrologic maps.

The project site is located within the Novato Creek Watershed Basin. Novato Creek drains an area of 45 square miles constituting the largest watershed in eastern Marin County. The nearest surface water body to the project site is Pacheco Creek, which flows from south to north in an underground concrete culvert adjacent to the western project site boundary. Pacheco Creek empties to Pacheco Pond, a flood control reservoir that discharges to Novato Creek. Novato Creek ultimately empties into San Pablo Bay near the Petaluma River, approximately 4 miles north of the project site.

The project site is located in the Novato Valley Groundwater Basin, a 32 square mile area located in the northeastern corner of Marin County. Based on environmental investigations at the project site, shallow groundwater is encountered at approximately 10 to 12 feet below ground surface and flows to the north-northeast (Miller Pacific, 2007). Groundwater at the site has been contaminated by methyl-tert-butyl ether (MTBE), a gasoline additive, which leaked from a former underground storage tank (UST) at the project site (Battelle, 2013). A deed restriction recorded in 2005 for the project site prohibits the use or extraction of groundwater except under a workplan approved by the Department of the Navy, the Regional Water Board, and DTSC. Additional information regarding groundwater contamination at the project site is included in the Hazards section of this Initial Study.

Discussion

a) Violate any water quality standards or waste discharge requirements?

Less Than Significant with Mitigation Incorporated. The State Water Resources Control Board and nine Regional Water Boards regulate water quality of surface water and groundwater bodies throughout California. In the Bay Area, including the project site, the Regional Water Board is responsible for implementation the Water Quality Control Plan (Basin Plan). The Basin Plan establishes beneficial water uses for waterways and water bodies within the region.

Runoff water quality is regulated by the National Pollutant Discharge Elimination System (NPDES) Program (established through the federal Clean Water Act). The NPDES program objective is to control and reduce pollutant discharges to surface water bodies. Compliance with NPDES permits is mandated by State and federal statutes and regulations. Locally, the NPDES Program is overseen by the Regional Water Board. The

Marin County Stormwater Pollution Prevention Program (MCSTOPPP) assists cities, towns, and the County with coordination and consistency of approaches across the County in implementing the Regional Water Board requirements.

Potential stormwater impacts at the project site may occur during remedial, construction, and operation phases. Any remedial or construction activities, including grading, that would result in the disturbance of one acre or more would be required to comply with the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activity (Construction General Permit). The project site is approximately 2.7 acres in area, and would therefore be subject to the Construction General Permit. Under the Construction General Permit, preparation of a SWPPP for the site would be required. The SWPPP would include Best Management Practices (BMPs) for erosion and sediment control, site management/housekeeping/waste management, management of non-stormwater discharges, runon and runoff controls, and BMP inspection/maintenance/repair activities, as consistent with the most recent version of the *California Stormwater Quality Association Stormwater Best Management Handbook*-Construction. Additional erosion control requirements as part of the Novato Municipal Code and grading permit are described under *Section VI, Geology and Soils*.

The project RAP and SMP require additional measures to protect stormwater quality during site remediation. Should decant water be present in stockpiled soil, the contractor shall locate the stockpile so that decant water drains back into the excavation or use other site control measures to prevent discharge of the decant water to water ways including storm drain inlets during stockpiling, loading, and transport. Water for dust control will be applied at a rate that prevents runoff and discharge to the storm drain or waters of the State. In accordance with the erosion and sediment control plan that will be required as a condition of the excavation permit, structural practices will be used, if necessary, to divert flows from exposed impacted soils or otherwise constrain runoff and the discharge of pollutants from exposed areas of the project site containing impacted soil. Similarly, silt fences, straw bales, diversion dikes, storm drain inlet protection, outlet protection, visqueen covers, sediment traps, and/or sediment basins will be used, as appropriate, to control storm water flow.

The project site is currently entirely covered with impervious surfaces (pavement, degraded pavement, and highly compacted soils), and all stormwater runoff is captured in Pacheco Creek and other City stormwater inlets. Although all construction details are not known, the project would add areas of landscaping which would be expected to result in a slight decrease the amount of stormwater discharged from the project site.

Operation of the project would be subject to compliance the State Water Resources Control Board's Phase II Small Municipal Separate Storm Sewer Systems (MS4s) Permit, issued in February 2013 by Order 2013-0001-DWQ.

Section E.12 of the Phase II MS4 Permit addresses requirements for retention and treatment of stormwater generated by development projects. If the project creates or replaces more than 2,500 square feet of impervious surfaces, the proposed project would be subject to these requirements. Section E.12 requires preparation of a Stormwater Control Plan (SCP). The SCP must include measures to capture and treat runoff from impervious surfaces. The SCP must incorporate site design measures to reduce project site runoff, such as porous pavement, green roofs, or vegetated swales. Local guidance for these requirements is provided MCSTOPPP. The City enforces the permit requirements under Municipal Code Chapter 7-4—Urban Runoff Pollution Prevention and Municipal Code Chapter 7-5 Regulatory Fee for Clean Stormwater Activities.

Implementation of **Mitigation Measures HAZ-1a** and **HAZ-1b**, included in the Hazards analysis, would ensure that stormwater quality is protected during the remedial phase of the project. Implementation of **Mitigation Measure HYD-1**, below, ensures implementation of remediation, construction- and operation-phase stormwater requirements which would reduce other potential water quality impacts to a less-than-significant level.

> <u>Mitigation Measure HYD-1</u>: As a condition of approval for grading and construction permits for the project site, the applicant shall demonstrate compliance with current requirements of the Construction General Permit and MS4 Permit including preparation of a Stormwater Pollution Prevention Plan (SWPPP) and a Stormwater Control Plan (SCP). The SWPPP shall be installed and maintained throughout the duration of remediation activities, during the interim period between the remediation and construction phases, and through the entirety of the construction phase of the project.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Less Than Significant. The proposed project would not include the use of groundwater. As groundwater has been measured at a depth 10 to 12 feet below ground surface, it is unlikely that groundwater dewatering would be required during construction of utility trenches and other excavation. Groundwater is not proposed to be used by the project during remediation, construction, or operation, and based on previous environmental investigations, the groundwater beneath the project site is considered unsuitable for municipal water supply use due to high total dissolved solids concentrations and low water yield (Batelle, 2014). Groundwater extraction and use is currently prohibited under a deed restriction for the project site.

The project site is currently almost entirely covered with impervious surfaces. Landscaping features of the proposed project and implementation of post-construction stormwater management measures such as pervious pavement and stormwater planters would result in a net increase in the amount of infiltration of precipitation and recharge of groundwater, a minor beneficial impact. Therefore, project impacts to groundwater supplies or recharge would be less than significant.

c) *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?*

Less Than Significant. The proposed project would not alter the course of a stream or a river. The project site is in an urban area and although redevelopment of the site would affect local drainage patterns, compliance with remedial, construction, and operation phase stormwater requirements (e.g., SWPPP) would ensure that development of the project would not result in substantial erosion or siltation on- or off-site.

d) *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?*

Less Than Significant. As noted in section (c), above, the proposed project would not alter the course of a stream or river. Compliance with operation-phase stormwater requirements would ensure that runoff rate and volumes would not increase and therefore no impacts to on- or off-site flooding would occur.

e) *Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?*

Less Than Significant. The project site is currently almost entirely covered with impervious surfaces. Landscaping features of the proposed project and use of stormwater management measures such as pervious pavement and stormwater planters would result in a slight decrease in the amount of impervious surfaces at the site.

Adherence to MS4 permit requirements would ensure that peak stormwater flows from the site do not exceed existing flows. No additional mitigation measures are required.

f) *Otherwise substantially degrade water quality?*

Less Than Significant with Mitigation Incorporated. Remediation, construction, and operation of the proposed project would not result in any substantial changes to on-site water quality, with the exception of potential impacts associated with stormwater runoff. Adherence to stormwater permit requirements and **Mitigation Measures GEO-2**, **HAZ-1b**, and **HYD-1** would reduce potential impacts to water quality to a less-than-significant level. No additional mitigation measures are required.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Less Than Significant with Mitigation Incorporated. The southwestern corner of the project site, adjacent to the culverted Pacheco Creek, is located within the 100-year flood hazard area as mapped by the Federal Emergency Management Agency (FEMA) (FEMA, 2009). The remainder of the site is located within the 500-year flood hazard area (FEMA, 2009).

Novato Municipal Code Chapter 5-31 contains detailed requirements for construction of housing within a mapped 100-year flood hazard area. All structures must have the lowest habitable floor, including basement, elevated to or above the base flood elevation. In addition, adequate drainage paths must be provided around structures to guide flood waters around and away from proposed structures.

The project site is not located in an area that would be susceptible to exacerbated flooding hazards from predicted sea level rise as a result of climate change. Hazard maps from San Francisco Bay Conservation and Development Commission (BCDC) show the project site is located outside areas that will be affected by the 16-inch sea-level rise predicted by the middle of this century as well as the 55-inch sea-level rise predicted by the end of this century (BCDC, 2009).

Implementation of **Mitigation Measure HYD-2** would reduce potential flooding hazards to future residents to a less-than-significant level:

> Mitigation Measure HYD-2: Prior to issuance of any construction permits for the project, the applicant shall submit documentation to the City Engineer to demonstrate that the proposed project complies with all elements of Novato Municipal Code Chapter 5-31 for housing proposed within the 100-year flood zone.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Less Than Significant. An analysis performed by BKF Engineers evaluated the potential effects of the project on 100-year flood hazard zones in the project vicinity (BKF, 2014). The analysis determined that as the proposed project did not include fill below base flood elevations, and that the project would not impede or redirect flood flows or otherwise affect base flood elevations in the project vicinity (BKF, 2014).

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding of as a result of the failure of a levee or dam?

No Impact. The project site is not located within a mapped dam failure inundation area (ABAG, 2003). Levees, including the nearby Hamilton Levee, are part of the City's flood control system. The Outboard Perimeter Levee was recently breached as part of a wetlands restoration project, allowing lands to the north of the project site, located at elevations near mean sea level, to revert to wetlands. The project site is located at an elevation of approximately 40 feet above mean sea level (Miller Pacific, 2007), well above the elevation of the newly created wetlands, and is not located in an area mapped as having a reduced flood risk due to protection by levees (FEMA, 2009). No significant impact would occur.

j) Inundation by seiche, tsunami, or mudflow?

No Impact. No enclosed surface water bodies, which might be subject to potential impacts from seiches, are located in the project vicinity. The geotechnical report for the project site concluded that due to the location of the site, over 1 mile west of San Pablo Bay, and the site elevation, approximately 40 feet above sea level, that the risk of tsunami was remote (Miller Pacific, 2007). The project site and vicinity is level and not located in an area susceptible to mudflows. Please refer to *Section VI, Geology and Soils*, for further information regarding mudflows, a type of landslide.

X. LAND USE AND PLANNING	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	❒	❒	■	❒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	❒	■	❒	❒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	❒	❒	❒	■

Affected Environment

The project site is located in an urbanized portion of Hamilton Field in the Exchange Triangle Area. The surrounding parcels are developed with a mix of residential, institutional, and transportation uses (i.e., Highway 101).

Discussion

a) Would the project physically divide an established community?

Less Than Significant. The division of an established community usually refers to the construction of a physical boundary or element (such as a freeway) that hampers movement between or within existing communities. The proposed project would change the current vacant space to multi-family residential use and increase the intensity of the use. The project would improve sidewalks along Main Gate Road and "C" Street with added landscaping and hardscaping, preserve all pedestrian access in the site's vicinity, but would not alter any established roadways. Therefore, the project would not physically divide an existing community, resulting in a less-than-significant impact.

b) Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Less than Significant with Mitigation Incorporated. The proposed project site has a deed restriction that prohibits the property from being redeveloped for residential purposes. However, the applicant submitted a Draft RAP to DTSC and the Regional Water Board to clean up the site to meet residential standards. If approved, the applicant would request from the Department of the Navy a release of the deed restriction. The proposed project also exceeds the height and story limit identified in the General Plan and Master (Reuse) Plan and proposes a land use—multi-family residential—that is inconsistent with the CN land use designation identified in the General Plan and the zoning of the Master (Reuse) Plan. However, the applicant has requested amendments to the General Plan, Master (Reuse) Plan, and Precise Development Plan. These amendments would accommodate the project by changing the land use designation and zoning to allow an increase in building heights from two to three stories and a maximum height that is increased from 30 to 34 feet.

Deed Restriction and Covenant Agreement

As noted in the Project Description, on April 18, 2005, the Department of the Navy (Grantor) transferred the project site (Hamilton Square Parcel) to Hamilton Square, LLC (Grantee) with certain deed restrictions on the use of the project site to protect present and future human health and safety as a result of the presence of hazardous materials on portions of the project site. Although the Land Use Covenant prohibits the property from being redeveloped for residential purposes, the deed states that "the Grantee may request approval for, and the Grantor may at its discretion provide, a variance or termination of the Prohibited Uses". The Grantee's request would only be made after the Grantee had applied for and obtained written approval from DTSC and the Regional Water Board for a variance or termination of the Prohibited Uses.

The applicant submitted a Draft RAP to DTSC and the Regional Water Board in November 2014, April 2015, August 2015, and October 2015 to improve site subsurface soil and groundwater conditions to meet residential human health standards in preparation for redevelopment. Once the Draft RAP is approved, remediation is complete, and it has been demonstrated, per the requirements of DTSC and the Regional Water Board, that the site is suitable for residential use, the applicant would apply to DTSC and the Regional Water Board for their consent to release the covenant to permit residential uses on the project site. If consent of the DTSC and the Regional Water Board as Covenantees is approved, the applicant would thereafter request from the Department of the Navy a release of the deed restriction by Notice of Release or other appropriate instrument.

The following mitigation measure would reduce this potential impact to a less-than-significant level:

> <u>Mitigation Measure LAND-1</u>: Prior to the City considering approval of the proposed amendments to the General Plan, Master Plan (Reuse Plan), or Zoning that would allow residential uses, the applicant shall provide the City with the Certificate of Completion for the RAP for the site, issued by the Regional Water Board and/or DTSC and the Notice of Release or other appropriate instrument on the deed

restriction as issued by the Department of the Navy that shows the deed restriction has been removed.

General Plan and Housing Element Consistency

The project site has a current land use designation of Neighborhood Commercial (CN) in the General Plan and Master (Reuse) Plan. The proposed project requires a land use designation of Medium Density Multiple Family Residential (R10) to accommodate the multi-family townhome-style development. In light of this inconsistency, the project includes a request for a General Plan Amendment to change the land use designation to R10 to accommodate the proposed project.

The policies, and programs of the 2015–2023 Housing Element support housing near transit and expanding the supply of multi-family infill housing sites specifically:

> HO Policy 6.1 Transit-Oriented Development. Encourage Multi-family Development within an easy walking distance to transit access points—a station or location served by one or more transit lines—where reduced automobile usage and parking requirements are possible. Maximize the use of these limited land resource sites to reduce overall energy, land, water and other costs.
>
> HO Policy 6.5 Regional Transportation/Housing Activities. The City will coordinate with regional transportation planning activities, and will facilitate transit-oriented housing development by using the incentives and other means provided through local and regional transportation plans.
>
> HO Policy 9.1 Flexibility and Incentives in Development Standards. The City will seek ways to promote housing, such as increased FAR, height limits and density, and reduced parking, based on the location and design of the development, compatibility with adjacent uses, and the type, size, and income levels of the occupants of the housing. The purpose of this policy is to recognize that smaller, more affordable housing located near transit, jobs, and services will generate fewer trips, require less parking, and have fewer area-wide impacts.
>
> HO Program 9.C Seek Increased Multi-Family Housing Opportunities. When undertaking City-wide and/or neighborhood General Plan amendments, specific plans, rezonings, or a similar community visioning process, the City will identify sites for multi-family affordable workforce and special needs housing where opportunities are available. Such sites and opportunities may include or consider the following:
>
> a. Land owned by the City or other governmental agencies (such as school districts).
> b. Re-use of underutilized or non-viable commercial and/or industrial sites.
> c. Parking lots.
> d. Residential, Commercial, and Mixed-Use sites where higher density residential is feasible.
> e. Appropriate sites in single-family neighborhoods where duplexes or small multi-family uses would be appropriate.

f. Prepare area-wide or specific plan environmental baseline data and assessment of development impacts under maximum development scenarios as a way to assess area-wide impacts and mitigation.
g. Use environmental assessments to expedite processing for infill and affordable housing, such as linking plans to CEQA exemptions and expedited review, consistent with CEQA Section 15332.
h. Establish objectives and commitments in the plans so that project-specific review can focus on site-specific issues such as design.
i. Provide clear guidelines and incentives for the development of housing in conformance with current local and State laws to streamline processing for subsequent development proposals.

The project would add to the supply of multi-family infill housing and fulfill the policy of providing more housing near transit. This project reinforces local General Plan policies and programs which emphasize compact and efficient growth through infill development instead of annexation and sprawl. The project site is also located near a future Novato South SMART rail station located on "B" Street near Main Gate Road.

Zoning Designation, Master Plan, and Precise Development Plan Consistency

Permitted Use

The current zoning for the project site is PD, Planned District. Projects located in the PD zoning district require approval of a Master Plan and a Precise Development Plan. The Hamilton Army Airfield Reuse Plan serves as the master plan for the proposed project site.

The Master (Reuse) Plan currently declares the zoning for the site as Neighborhood Commercial (CN). In order to proceed with the project as proposed, the applicant is requesting approval of two site-specific amendments to the Master (Reuse) Plan: (1) change the zoning from CN to R10; and (2) amend the text of the Master (Reuse) Plan to allow two exceptions on the project site related to building height including: (a) allow an increase in building heights from two to three stories; and (b) allow an increase in maximum height from 30 to 34 feet.

The Precise Development Plan approved in 2007 for the site was for an office condominium project. The proposed multi-family residential project is inconsistent with the current zoning; however, the applicant has applied for an amendment to the Precise Development Plan for the project site to establish specific development standards for the proposed project, and to allow an increase in height from two to three stories and an increase in maximum height from 30 to 34 feet.

These requests will be submitted to the Planning Commission for review and a recommendation will be given to City Council which has final decision-making authority over the General Plan, Master (Reuse) Plan, and Precise Development Plan amendments.

Landscaping and Open Space Requirements
The proposed site design includes landscaping along the frontage of Main Gate Road and "C" Street, the alleys within and around development, and within the interior park space. Although landscape plans are still in development, the proposed open space would meet the required minimum of 300 square feet of open space area per unit requirement where at least half is available to and private for the occupants of each dwelling unit.

Regional Land Use Plans, Policies, and Regulation
In addition to General Plan and Zoning Code regulations, the proposed project would be subject to the requirements and guidelines of several regional plans and policies. These plans and policies include, but are not limited to, the BAAQMD 2010 Clean Air Plan; the Regional Water Board's San Francisco Basin Plan and applicable National Pollutant Discharge Elimination System permits; the 2007 Marin Countywide Plan, and the San Francisco Bay Conservation and Development Commission's San Francisco Bay Plan. The proposed project would also be consistent with the Association of Bay Area Government and Metropolitan Transportation Commission's Plan Bay Area Sustainable Communities Strategy as required by SB 375. The Sustainable Communities Strategy promotes compact development that is walkable and bikeable and close to transit, jobs, schools, shopping, parks, recreation, and amenities to help meet greenhouse gas reduction targets established for the region by the California Air Resources Board (ABAG and MTC, 2014). This is consistent with local General Plan policies and programs which emphasize compact and efficient growth through infill development instead of annexation and sprawl. Compliance with applicable plans, policies, and regulations are evaluated in their respective impact sections.

With implementation of **Mitigation Measure LAND-1**, the project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, resulting in a less-than-significant impact.

c) *Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?*

No Impact. The City of Novato has not approved a habitat conservation plan or natural community conservation plan. The site is not within an area that is subject to a habitat or natural community conservation plan. Therefore, the project would not result in an impact.

XI. MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	❒	❒	❒	■
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	❒	❒	❒	■

No Impact. Mineral production in and around Novato has primarily consisted of sand and gravel. The State Division of Mines and Geology has designated three sites as Resource Sectors in the Novato area (MRZ-2 zones) in Black Point, Burdell Mountain, and Bowman Canyon. No mineral resources have been identified at the project site. The project would therefore have no impact in relation to these criteria. The project site is not designated by the General Plan or other land use plan as a locally important mineral recovery site. Therefore, implementation of the proposed project would not have an impact on mineral resources.

XII. NOISE

Would the project result in:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	❒	■	❒	❒
b) Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?	❒	❒	■	❒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	❒	❒	■	❒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	❒	■	❒	❒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	❒	❒	❒	■
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	❒	❒	❒	■

Affected Environment

Noise-sensitive land uses (or receptors) can be defined as those areas that benefit from a lowered sound level, consistent with areas of primary human activities, such as sleeping or learning. Examples of noise-sensitive land uses include, but are not limited to, residences, schools, daycare facilities, hospitals, places of worship, parks, and libraries. Noise-sensitive land uses in the immediate project site vicinity include residences, a school, and a children's center.

There are several noise measurement scales that are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. Each 10-decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities.

There are several methods of characterizing sound. The most common in California is the A-weighted sound level (dBA). All sound levels in this section are A-weighted, unless reported otherwise. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive.

Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be used. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq}. The most common averaging period is hourly, but it can be of any duration.

Since the sensitivity to noise increases during the evening and at night—because excessive noise interferes with the ability to sleep—24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Day/Night Average Sound Level, L_{dn}, is a measure of the cumulative noise exposure in a community, with a 10-dB addition to nighttime (10:00 p.m. to 7:00 a.m.) noise levels.

Existing Noise Environment

A noise measurement survey was conducted in April 2014 to document and characterize existing noise levels on the project site. The survey occurred between Wednesday, April 16, 2014 and Friday, April 18, 2014. Noise levels were measured at five locations. Two of the five measurements (LT-1 and LT-2) were long-term (i.e., 48+ hours in duration) and were made to quantify the daily trend in noise levels on-site and in the project site vicinity. The three remaining noise measurements (ST-1, ST-2, and ST-3) were short-term (i.e., 10 minutes in duration). The measurement locations are shown in Appendix C. Weather conditions during the noise measurements were characterized by clear skies, mild temperatures, and calm to light winds.

Noise measurements were made using Larson-Davis Model 820 integrating sound level meters fitted with precision microphones and windscreens. The sound level measuring assemblies were calibrated before and after the noise monitoring survey, and the response of the systems was always found to be within 0.2 dB of the calibrated level. No calibration adjustments were made to the measured noise levels.

Site LT-1 was located approximately 60 feet from the center of "C" Street at the northeast corner of the project site. Day-night average noise levels at site LT-1 were 58 dBA L_{dn}. The daily distribution of noise levels at LT-1 is summarized in Appendix C. Site LT-2 was located at the southeast corner of the project site, approximately 55 feet from the center

TABLE 6 SHORT-TERM NOISE MEASUREMENT RESULTS

Noise Measurement Location (Date-Time of Noise Measurement)	L_{eq}	L_{50}	L_{90}	Estimated L_{dn}
ST-1—Midpoint of site, approximately 150 feet west of "C" Street (4/18/14, 1:20 PM)	51	48	43	57
ST-2—Midpoint of site, approximately 225 feet west of "C" Street (4/18/14, 1:20 PM)	50	48	45	56
ST-3—Westernmost property line of site (4/18/14, 1:30 PM)	50	48	45	56

Source: Illingworth & Rodkin, Inc., 2014

of Main Gate Road. The day-night average noise level at site LT-2 was 62 dBA Ldn. The daily distribution of noise levels at LT-2 is also summarized in Appendix C. Short-term noise measurements were conducted at three additional locations, as indicated in Appendix C. Table 6 summarizes the results of the short-term noise measurements.

Noise Standards

Noise standards applicable to the proposed project include General Plan policies and Municipal Code standards, which are summarized below.

The General Plan identifies noise and land use compatibility standards for various land uses. The standards are in terms of exterior noise levels at private or shared exterior use areas. The City's "conditionally acceptable" noise-level objective for residential land uses is 60 to 75 dBA L_{dn} and the City's "normally acceptable" noise-level objective is 60 dBA L_{dn}. "Conditionally acceptable" noise levels may be permitted for its specified use only after detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design of the project. These exterior noise performance standards are intended to result in compliance with the residential interior noise standard of 45 dBA L_{dn}.

Section 19.22.070 of the City's Municipal Code establishes allowable exterior noise levels and allowable hours of construction. Noise from construction activities is exempt from the exterior noise-level standards provided that the construction activities occur during the allowable hours specified under Item B, below.

> 19.22.070—Noise and Construction Hours.
>
> A. Uses, activities, and processes shall not generate or emit any noise or sound in excess of the levels provided in Table 3-5 [not shown] beyond the property line of the parcel on which they are located, except as provided in subsection B of this section.

B.Exceptions. The following are exempt from the allowable noise-level requirements of Table 3-5 as noted.

Authorized construction activities, including warming-up or servicing equipment, and any preparation for construction between 7:00 am and 6:00 pm on weekdays, and between 10:00 am and 5:00 pm on Saturdays. No construction is allowed on Sundays or official federal national holidays, except as otherwise authorized herein by the Community Development Director;

Authorized grading activities and equipment operations between 7:00 am to 6:00 pm weekdays only, when city inspectors are available.

Other construction activities as authorized in writings by the Community Development Director.

C.Noise Measurement. Exterior noise levels shall be measured at the property line of the noise source. Noise measurement shall be made with a sound level meter using the "A" weighted scale at slow meter response. Fast meter response shall only be used for an impulsive noise.

D.Authorized Construction. Authorized construction activity and uses established through the discretionary land use permit process may be subject to specific noise conditions of approval and/or mitigation measures that are more restrictive.

Vibration Standards

Section 19.22.090 of the Novato Municipal Code states as follows: "Uses, activities, and processes shall not generate ground vibration that is perceptible without instruments by the average person at any point along or beyond the property line of the parcel containing the activities. Vibrations from temporary construction, demolition, and vehicles that enter and leave the subject parcel (e.g., construction equipment, trains, trucks, etc.) are exempt."

Discussion

a) *Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*

Future Exterior Noise Environment

Less Than Significant with Mitigation Incorporated. Vehicular traffic along Highway 101, Main Gate Road, and "C" Street would continue to be the predominant source of noise affecting the noise environment at the project site. Future SMART trains would pass within about 550 feet of the project site, but would not sound their warning whistles at the nearest point of passage unless necessary. Northbound SMART trains would be required to sound their warning whistles just north of State Access Road when approaching within one-quarter mile of the Hamilton Parkway at-grade crossing (over 1,000 feet from the project site). Maximum instantaneous noise levels received at the project site due to distant train horns would range from about 65 to 70 dBA Lmax when accounting for the distance between the noise source and receptor, the directionality of the whistle blast, and attenuation provided by intervening structures. Noise resulting from activities at the playground of the Novato Charter School, east of the site, would also be audible at times, but would not be a significant contributor to the future noise environment expected at the site.

Highway 101 is located approximately 800 feet west of the project site and is a contributor to the existing noise environment. Future population growth in Novato and in surrounding communities is anticipated to result in additional vehicle trips along area roadways, increasing noise levels at the project site by 1 to 2 dBA L_{dn} by the future horizon year of 2035. Similar noise increases are expected along Main Gate Road because of additional future traffic volumes. The future noise environment at the site is anticipated to range from 58 dBA L_{dn} at Hamilton Square to up to 65 dBA L_{dn} at the residential units nearest Main Gate Road.

Hamilton Square, an approximately 10,270 square feet open space area located on the interior of the site, would be the residents' primary outdoor activity area. Exterior noise levels at Hamilton Square are calculated to be less than 60 dBA L_{dn} when accounting for the distance from the noise sources and the acoustical attenuation provided by intervening buildings. Exterior noise levels at Hamilton Square would be considered "normally acceptable" according to the General Plan.

Future Interior Noise Environment

The City of Novato requires that interior noise levels within new residential units be maintained at or below 45 dBA Ldn. In buildings of typical construction, with the windows partially open, interior noise levels are generally 15 dBA lower than exterior noise levels. With the windows closed, standard residential construction typically provides 20 to 25 decibels of noise reduction. For example, a unit exposed to exterior noise levels of 65 dBA L_{dn} would be 50 dBA L_{dn} inside with the windows partially open and would range from 40 to 45 dBA L_{dn} with the windows shut. Attaining the necessary noise reduction from exterior to interior spaces is possible with proper wall construction techniques, the selection of proper windows and doors, and the incorporation of a forced-air mechanical ventilation system to allow the occupant the option of controlling noise by closing the windows. The future noise environment at the site is anticipated to range from 58 dBA L_{dn} at Hamilton Square to up to 65 dBA L_{dn} at the residential units nearest Main Gate Road. Interior noise levels would exceed the maximum allowable interior sound level of 45 dBA L_{dn} without the incorporation of forced-air mechanical ventilation in the project's design.

Standard construction methods (windows and doors necessary to meet building energy efficiency standards) would be sufficient at all exterior facades. No special sound-ratings are required for windows or doors.

> Mitigation Measure NOI-1: Provide a suitable form of forced-air mechanical ventilation, as determined by the City Engineer, for residential units throughout the site, so that windows could be kept closed at the occupant's discretion to control noise and achieve the 45 dBA L_{dn} interior noise standard.

The implementation of **Mitigation Measure NOI-1** would reduce interior noise to 45 dBA L_{dn} or less, resulting in a less-than-significant impact.

b) *Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?*

Less Than Significant. In general, ground-borne vibration from standard construction practices (i.e., construction that does not involve pile driving) is only a potential issue when within 25 feet of sensitive uses based on reference vibration levels from the U.S. Department of Transportation, Federal Transit Administration (FTA, 2006) and vibration attenuation theory. Because construction is not proposed within 25 feet of any sensitive uses and does not involve pile driving, the potential impact of ground-borne vibration is considered less than significant.

As discussed in the Draft Environmental Impact Report (DEIR) for the Sonoma-Marin Area Rail Transit project (SMART, 2005), the FTA has established a vibration impact criterion of 0.01 inches per second root mean square (RMS) vibration velocity. This vibration velocity level is perceptible to humans but is generally not considered disturbing. Vibration damage to even fragile structures does not occur unless vibration levels are much greater than the levels found disturbing by most people. A vibration velocity level less than 0.12 inches per second peak particle velocity (approximately 0.03 inches per second RMS velocity) would not cause damage to fragile historic buildings.

The Sonoma-Marin Area Rail Transit Project DEIR concluded that, while the effect of ground-borne vibration from future SMART operations could be perceptible to sensitive receptors within 20 to 100 feet of the tracks, that vibration would be negligible at less than the applicable FTA significance criterion of 0.01 inches per second RMS vibration velocity. The nearest building façade of the proposed project would be located over 500 feet from future SMART tracks. Therefore, the impact of ground-borne vibration would be less than significant.

Ground-borne noise in buildings and structures is produced when interior surfaces such as walls and floors are "excited" into motion by ground-borne vibration transmitted into a given structure. Ground-borne noise is primarily a concern for underground subway projects and is not typically an issue for standard construction practices. Operation of the proposed project would also not be a source of ground-borne vibration or ground-borne noise. Therefore, neither construction nor operation of the proposed project would expose persons to or generate excessive ground-borne vibration or noise levels.

c) *A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?*

Less Than Significant. The proposed project would slightly increase traffic volumes along roadways serving the project site. According to the project traffic consultant, the project is expected to generate 14 new AM and 16 new PM peak hour trips. A substantial noise-level increase is considered to be 3 dBA L_{dn} or more because changes in environmental noise levels of 3 dBA L_{dn} or less are usually not noticeable in outdoor environments.

It is generally accepted that a doubling in daily traffic volumes along a given roadway will result in a noise-level increase of 3 dBA L_{dn}. Under existing conditions, there are 670 vehicle trips along Main Gate Road during the AM peak hour and 701 vehicle trips along Main Gate Road during the PM peak hour. The addition of 14 to 16 new peak hour trips would be negligible when compared to the traffic currently using the intersection. Therefore, project-related traffic would not result in a substantial noise-level increase in the project vicinity above existing conditions.

d) *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?*

Less Than Significant with Mitigation Incorporated. The project would include the construction of 31 townhome units. Various types of equipment would be used for construction purposes. The loudest expected phase of construction would include grading/excavation, which would utilize excavators, graders, dozers, and tractors. Maximum instantaneous noise levels resulting from the operation of construction equipment during this phase would range from 85 dBA to 90 dBA Lmax at a distance of 50 feet. Average noise levels generated by grading activities associated with the project are calculated to reach 85 dBA L_{eq} at a distance of 50 feet during busy periods. During each stage of construction, there would be a different mix of equipment operating at any given time. Construction noise levels would vary by stage and vary within stages based on the amount of equipment in operation and location where the equipment is operating.

Residences and educational land uses bordering the site would be temporarily affected by construction noise. Standard methods for acoustical analysis of construction sites are based on the distance from the "acoustical center" or construction activity center of the site to the nearest noise-sensitive receptor, as was the case for this analysis. In other words, noise from the proposed pieces of construction equipment is not modeled at the construction area boundary, but rather at the approximate center of the area in which most construction activity is likely to occur. The nearest noise-sensitive receptors are located approximately 300 feet from the center of the proposed construction site. Construction noise levels drop off at a rate of about 6 dBA per doubling of distance between the noise source and receptor, so noise levels at 300 feet would be expected to be approximately 16 dBA lower than those predicted at a distance of 50 feet (69 to 74 dBA Lmax and 69 dBA L_{eq}). This prediction does not take into account intervening structures or terrain that could reduce noise levels further.

Noise impacts resulting from construction activities would depend on the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive receptors. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction durations last over extended periods of time. The proposed hours of construction are from 7:00 a.m. to 6:00 p.m. on weekdays and from 10:00 a.m. to 5:00 p.m. on Saturdays, consistent with the hours for which the City exempts construction-related noise. Remediation activities may be permitted on Sundays from 10:00 a.m. to 5:00 p.m. on the basis of completing remediation of the site on weekends when children are not present at the North Bay Children's Center, Hamilton Charter School, Wonder Nook Preschool, and Hamilton Elementary School. If approve, remediation work could occur on up to six (6) consecutive Sundays. No construction is proposed on Sundays or legal holidays for the general construction period of the project. Therefore, temporary construction would occur within the hours construction noise is exempted from the City's noise regulations and, as a result, would not occur during the more noise-sensitive times of the day.

The number of truck trips to haul a maximum of 3,500 cubic yards of soil export and 3,500 cubic yards of soil import during remedial activities would be approximately 350 trips over 15 days or approximately 23 trips on a daily basis.[1] This minor increase would not affect the findings, particularly considering they would be temporary and for a short duration.

While construction activities would occur between the hours construction noise is exempted by the City, construction activities could result in a substantial temporary increase in ambient noise levels in the project vicinity above levels existing without the project. However, construction activities would result in a less-than-significant short-term noise impact provided that mitigation measures, in the form of best available construction

[1] The Draft Rap estimates the soil export volume to be closer to 2,800 cubic yards; however, 3,500 cubic yards was used for the traffic analysis as a more conservative estimate.

noise controls specified in **Mitigation Measure NOI-2** below, are implemented during all construction phases.

> Mitigation Measure NOI-2: Construction equipment shall be well maintained and used judiciously to be as quiet as practical. The following measures, when applicable, shall be followed to reduce noise from construction activities and shall be the responsibility of the project applicant:
>
> > Equip all internal combustion engine-driven equipment with mufflers, which are in good condition and appropriate for the equipment.
> >
> > Use "quiet" models of air compressors and other stationary noise sources where technology exists.
> >
> > Locate stationary noise-generating equipment and construction staging areas as far as feasible from sensitive receptors when sensitive receptors adjoin or are near a construction area.
> >
> > Prohibit unnecessary idling of internal combustion engines.
> >
> > Designate a "construction liaison" that would be responsible for responding to any local complaints about construction noise. The liaison would determine the cause of the noise complaints (e.g., starting too early, bad muffler, etc.) and institute reasonable measures to correct the problem. Conspicuously post a telephone number for the liaison and the City of Novato at the construction site.
> >
> > Hold a pre-construction meeting with the job inspectors and the general contractor/on-site project manager to confirm that noise mitigation and practices (including construction hours, construction schedule, and noise coordinator) are completed.

Mitigation Measure NOI-2 would reduce noise generated by the construction of the project to the maximum extent feasible. Construction noise impacts due to construction would be considered less than significant with mitigation.

e) *For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?*

No Impact. The project site is not located within an airport land use plan or within 2 miles of an airport. Therefore, implementation of the proposed project would not expose persons within the project site to high levels of airport-related noise. There would be no impact.

f) *For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?*

No Impact. The proposed project is not located within the vicinity of a private airstrip. The Hamilton Army Airfield has been closed since the mid-1990s and the San Rafael private airstrip is located 2.5 miles south. Therefore, implementation of the proposed project would not expose persons within the project site to high levels of airstrip-related noise. There would be no impact.

XIII. POPULATION AND HOUSING	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	❐	❐	■	❐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	❐	❐	❐	■
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	❐	❐	❐	■

Affected Environment

The proposed project would add 31 units to the housing stock of the City of Novato. This section analyzes the potential impact of the project on existing uses in the vicinity due to the potential displacement of housing or people.

Discussion

a) Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Less Than Significant. With 31 units, the proposed project is estimated to result in an on-site population of about 77 persons (2.5 persons/household). The proposed project addresses the following goals from the 2015-2023 Housing Element adopted in November 2014:

> *Maintain and enhance existing housing and blend well-designed new housing into existing neighborhoods*
>
> *Use land efficiently to meet housing needs, minimize environmental impacts and maximize opportunities to use alternative transportation modes such as transit, bicycling and walking*

The site's development would contribute toward the City's goal of locating housing within walking distance of public transit facilities. In addition, the project contributes to the General Plan's emphasis on compact and efficient growth through infill development instead of annexation and sprawl. Furthermore, considering the City of Novato has approximately 21,851 housing units, an additional 31 units would not induce substantial population growth directly or indirectly and would therefore have a less-than-significant impact related to population growth (United States Census, 2010–2014).

b) Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No Impact. The project site is vacant. There are no residential units on the site. As a result, development of the project would not result in the displacement of residential units nor necessitate construction of replacement housing elsewhere.

c) Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact. Development of the project would not result in the displacement of people nor necessitate construction of replacement housing elsewhere.

XIV. PUBLIC SERVICES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	❒	❒	■	❒
Police protection?	❒	❒	■	❒
Schools?	❒	❒	■	❒
Parks?	❒	❒	■	❒
Other public facilities?	❒	❒	■	❒

Affected Environment

The project site is in an urban area served by existing infrastructure and public services. This section evaluates the potential impact of the project, which includes 31 residential units, on the provision of services.

Discussion

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: fire protection, police protection, schools, parks, or other public facilities?

Fire Protection—Less Than Significant. Fire protection to the project site is provided by the Novato Fire Protection District (NFPD). The NFPD operates five fire stations in Novato. Station 65 (Hamilton) located at 5 Bolling Drive, (approximately 0.5 miles away) is the nearest station to the project site. The station accommodates quarters for a three-person Fire District Paramedic Engine Company (including one Captain, one Engineer and one Firefighter/Paramedic staff) and the 15-person Tam Fire Crew (part of Marin County Fire Department) during Wildland Fire Season. Station 5 also provides office space for law enforcement partners (Novato Police, Marin County Sheriff, and California Highway Patrol) and the Marin County Coroner (City of Novato, 2014c).

Based on nationally recognized standards, the NFPD strives to maintain an emergency response time goal of 8 minutes from the time a call is received, 90 percent of the time. Currently, the NFPD has an average response time of 5 minutes from the time a call is received (Felciano, 2014).

Implementation of the project may result in an incremental increased demand for fire protection services. However, the project is located on a site in a highly-developed area, in close proximity to existing fire protection services. The project would not require the provision of or need for new or physically altered facilities to continue to serve the project site. As a result, the project would not result in a substantial adverse physical impact nor would it substantially affect response times for fire services. The project's impact related to the provision of fire services would be less than significant.

Police Protection—Less Than Significant. Law enforcement services in Novato are provided by the Novato Police Department. Novato has one police station located at 909 Machin Avenue, approximately 4.5 miles from the project site. The Police Department has approximately 78 staff in the department including 59 sworn officer positions and a robust volunteer program (City of Novato, 2014d). The result is a ratio of 1.07 sworn officers for every 1,000 residents (based on an estimated 55,005 residents in 2014) (United States Census, 2010-2014).

Implementation of the project may result in an incremental increased demand for police services. However this increase would not be substantially greater than the existing demand for police services in the area, and thus meeting this additional demand would not require the provision of or need for new or physically altered facilities to continue to serve the project site. The project would therefore have a less-than-significant impact on police protection services.

Schools—Less Than Significant. The project could generate students, as some of the residents of the 31 new units may be families with school-age children. It is anticipated that existing schools in the area could accommodate these new students.

The Novato Unified School District contains 8 elementary schools, 2 middle schools, 2 high schools, 1 continuation school, and 1 independent study education school. The school district also operates Novato Charter School, serving kindergarten through 8^{th} grade students, and the Nexus Academy for 7^{th} through 10^{th} grades. The project site lies within the school boundaries for Hamilton Elementary School (Kindergarten through 8^{th} grade), San Jose Intermediate School (6^{th} through 8^{th} grade), and Novato High School (9^{th} through 12^{th} grade). The project site is also adjacent to the Novato Charter School. Table 6 describes capacity and current enrollment for each of the schools serving the project site. To determine the number of students that the project could generate, the District uses

TABLE 7 PROJECTED POPULATION GROWTH AND CAPACITY, BY SCHOOLS SERVING THE PROJECT SITE

School	Capacity	2013–2014 Enrollment
Hamilton Elementary	760	720
Novato Charter	250	258
San Jose Intermediate	800	721
Novato High	1,914	1,331

Source: Ashe, Dave, Construction Manager, Novato Unified School District, 2014. Personal communication. May 6.

students per household factors to estimate student enrollment. For attached single-family housing, the factor is 0.516. Based on these factors and assuming 31 units, an increase of approximately 16 students could result from the project. As shown in Table 7 above, although Novato Charter School is over capacity, the local elementary, intermediate, and high schools have adequate capacity to accommodate these students.

In addition, the project would be subject to school impact fees for residential development constructed within the City to be paid to the District, effective September 1, 2014 for developments over 500 square feet (NUSD, 2014).

The project would not result in a substantially increased demand for school facilities, and would not require new or expanded school facilities. Additionally, it would pay the school the impact fee. As a result, the project's impact would be less than significant on school facilities.

Parks— Less Than Significant. Parks within the vicinity of the project include the sports field at Hamilton Elementary, public open space on the north side of Hamilton Parkway northeast of the project site, the San Francisco Bay Trail, and several large open space areas including Loma Verde Preserve and Pacheco Valle Preserve, west of Highway 101 which offer outdoor activities such as hiking, horseback riding, and mountain biking. The project also includes private on-site open space and recreation space including a central park space, patios, landscaped areas, and plaza that would provide residents with space to support active and passive recreation.

The City mitigates impacts created from additional demands on existing park and recreation services due to the increase in new residential development by imposition of park-in-lieu fees. Half of the total fee is due as a condition of final map or parcel map approval, with the remaining balance paid at the time of issuance of building permits (paid per permit) for subdivisions with less than 50 units as defined in the Novato Municipal Code, Chapter 9-20: Park Dedication and In-Lieu Fees (Quimby).

Residents of the project would not be expected to increase the use of existing neighborhood parks and recreation facilities to such extent that these facilities would be physically degraded or their substantial physical deterioration would be accelerated. The incremental residential growth that would result from the project would not require the construction of new recreational facilities or the expansion of existing facilities. The impact on recreational facilities would therefore be less than significant.

XV. RECREATION	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	❐	❐	■	❐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	❐	❐	■	❐

Affected Environment

The City of Novato is served by numerous parks and approximately 200 acres of open space (59 acres of developed park land, 169 acres of undeveloped future park lands) (General Plan, 1996). The City owns and operates a range of recreation facilities, including: the Downtown Recreation Center, City Hall, Hamilton Community Center, Hill Community Room, Margaret Todd Senior Center, Novato Arts Center at Hamilton Field, a skate park, tennis courts, and a gymnastics center (City of Novato, 2014e). Hamilton Field alone offers 70 acres of park and open space and 50 acres of community facilities (The Landing at Hamilton, 2014).

The General Plan has several objectives and policies encouraging the development of more parks and trails for Novato residents including:

> EN Objective 14 Provide an attractive and comprehensive system of parks and trails throughout the city to meet the recreational needs of the entire community.
>
> EN Policy 44 Park and Recreation Facilities. Develop and maintain to the maximum extent possible given available resources a system of parks to meet the needs of Novato residents.
>
> EN Policy 45 Community and Neighborhood Parks. Consider implementing planning and funding for community parks. Encourage neighborhood parks emphasizing homeowner association ownership.
>
> EN Program 45.1: Consider requiring developers to provide neighborhood parks in keeping with their project and also contribute toward communitywide parks consistent in the anticipated use of community facilities by potential residents of the proposed development.

The project includes an open space in the center of the project site in addition to an adjacent plaza area with Mail Pavilion that leads to an entry green along Main Gate Road to serve the recreational needs of future residents. Furthermore, in accordance with the R10 zoning designation, the project would satisfy the minimum of 300 square feet of open space area per unit requirement where at least half is available to and private for the occupants of each dwelling unit.

Discussion

a) *Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?*

Less Than Significant. Residents of the project would not be expected to increase the use of existing recreation facilities, including the community center, arts center, senior center, skate park, and gymnastics center, to such extent that these facilities would be physically degraded or their substantial physical deterioration would be accelerated.

As previously stated, the City mitigates impacts created from additional demands on existing park and recreation services due to the increase in new residential development by imposition of park-in-lieu fees. Half of the total fee is due as a condition of final map or parcel map approval, with the remaining balance paid at the time of issuance of building permits (paid per permit) for subdivisions with less than 50 units as defined in the Novato Municipal Code, Chapter 9-20: Park Dedication and In-Lieu Fees (Quimby).

The incremental residential growth that would result from the project would not result in substantial or accelerated physical deterioration. The impact on recreational facilities would therefore be less than significant.

b) *Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?*

Less Than Significant. The project does not propose the construction or expansion of any new recreational facilities that might have an adverse physical effect on the environment, although the project does include on-site open space and recreation facilities including a large park space. The incremental residential growth that would result from the project would not require the construction of new recreational facilities or the expansion of existing facilities. The impact on recreational facilities would therefore be less than significant.

XVI. TRANSPORTATION/TRAFFIC Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	❐	❐	■	❐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	❐	❐	■	❐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	❐	❐	❐	■
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	❐	❐	■	❐
e) Result in inadequate emergency access?	❐	❐	■	❐
f) Conflict with adopted polices, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	❐	❐	■	❐

Affected Environment

The section below provides background information and presents the methodology for the traffic analysis, based on the "Final Traffic Impact Analysis for the development of a Professional Business Office Campus called the Hamilton Main Gate Plaza in Hamilton Field Novato CA" prepared by Kimley-Horn and Associates and dated June 11, 2007 and attached as Appendix E.

Discussion

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant *components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?*

Background

Analysis of environmental impacts at intersections is based on the concept of Level of Service (LOS). LOS is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, LOS A represents free flow conditions and LOS F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2000. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

City Standards

The City of Novato's General Plan includes the following objective, policy and program regarding traffic operation.

> TR Objective 2: Improve and manage the City's roadway system to accommodate future growth and maintain acceptable levels of service.
>
> TR Policy 4, Level of Service Standards. Establish traffic Level of Service (LOS) standards for use in (1) evaluating the impacts of proposed development projects so the project can be redesigned or effective mitigation measures can be implemented, (2) making improvements to the roadway system, and (3) determining appropriate traffic impact fees.
>
> TR Program 4.1: Establish traffic Level of Service standards as follows:
>
> 1) At intersections with signals or four-way stop signs: operation at LOS D
>
> 2) At intersections with stop signs on side streets only: operation at LOS E

Mitigation measures which reduce side street delay, such as traffic signals, all-way stops and/or center two-way left turn lanes need to be considered when LOS F conditions are projected for side-street traffic. The volume of traffic also needs to be considered when evaluating the severity of side-street traffic operations.

Study Area

Three intersections were evaluated in the "Final Traffic Impact Analysis for the development of a Professional Business Office Campus called the Hamilton Main Gate Plaza in Hamilton Field Novato CA" prepared by Kimley-Horn and Associates and dated June 11, 2007. The study area included the intersections of (1) Nave Drive/Main Gate Road, (2) Nave Drive/State Access Road, and (3) Main Gate Road/"C" Street. Operating conditions at these three locations were evaluated in this prior study, and it was concluded that all three were operating acceptably under Existing volumes and would continue to do so upon adding project-generated traffic. It was noted that, "With the addition of project traffic the change in average delay or volume to capacity ratio is negligible and does not change the intersection level of service." Based on the information presented in that study, the critical intersection, or the one exhibiting the lowest (worst) service level, is Nave Drive/Main Gate Road. This intersection was selected to represent the study area as it has been included in other studies and information relative to future conditions are therefore available for this location. Note that similar information is not available for either of the other intersections evaluated by Kimley-Horn.

In order to confirm that the 2007 data were still adequate for evaluating the current project proposal, the operational results from 2007 were compared to operational results as contained in the Existing Conditions Background Report prepared by W-Trans for the City using volumes collected in 2013 for numerous intersections throughout the City; this report was prepared as a first step in the City's General Plan update process. It was determined that volumes are similar or lower than those used for the 2007 study, making the analysis somewhat conservative.

Planned Improvements

Based on a review of the City of Novato's Capital Improvement Plan (CIP), the following improvement projects are planned near the proposed project site:

- Hamilton Wetlands Access Road
- Sidewalk on Nave Drive from Bolling Drive to Hamilton School

Level of Service

Based on the City of Novato's "General Plan Existing Conditions Background Report" from 2014, the intersection of Nave Drive/Main Gate Road is currently operating acceptably at Level of Service (LOS) A or B during the weekday AM and PM peak periods.

Future operating conditions at this intersection obtained from the "2002 Citywide Traffic Model Update", W-Trans, April 2002 were reviewed. This study indicates that, with a minor improvement to include a right-turn overlap, the intersection of Nave Drive/Main Gate Road is expected to operate acceptably under build-out volumes that include development of all of the parcels that were vacant or under-developed at the time the report was prepared. While it is noted that some time has elapsed since this report was prepared, a comparison of Existing Conditions in 2007 (Kimley-Horn) are quite similar to the Existing Conditions reported in 2002, and operation as reported in the "General Plan Existing Conditions Background Report" in 2014 is better than what was reported in 2002, thus the data appears reasonable for use in this review.

Project Trip Generation

The trip generation for the project site that was used for the previous analysis was reviewed and compared to the current proposal. As shown in Table 8, the proposed housing project is expected to generate an average of 180 trips per weekday, including 14 trips during the AM peak hour and 16 trips during the PM peak hour. The previously proposed project included 30,550 square feet of office space, and was expected to generate an average of 535 trips on a daily basis, with 73 of those during the AM peak hour and 113 during the PM peak hour. Assuming there were at least four vehicle fueling positions at this service station (which is fewer pumps than would typically be included), the site would have generated an average of about 674 daily trip ends, including 49 during the AM peak hour and 55 during the PM peak hour. The currently proposed project is expected to generate substantially fewer trips than the previous use as well as the previously proposed project and would not exceed the City's thresholds documented above in City Standards; as a result, the current project's impact on traffic operation is less than significant. While not used for the analysis, the trip generation estimates for both the previously proposed project and prior site uses provide context in terms of how the number of trips that the proposed site uses would generate compare to these other development scenarios.

The number of truck trips to haul a maximum of 3,500 cubic yards of soil export and 3,500 cubic yards of soil import during remedial activities would be approximately 350 trips over 15 days or approximately 23 trips on a daily basis.[10] This minor increase would not affect the findings above, particularly considering they would be temporary and for a short duration and would occur on weekends when peak traffic is significantly lower. As proposed by the applicant, trucks entering and exiting the site would utilize State Access Road, Nave Drive, and Highway 101 to transport soil to the Potrero Hills Landfill in Suisun City and/or B&J Landfill in Vacaville. This path of travel avoids mixing remediation traffic with traffic on Main Gate Road.

Construction truck trips associated with construction phase of the project, similar to those associated with the remedial phase, would result in a minor increase in traffic and would not affect the findings above, recognizing such trips would be temporary. As proposed by the applicant, construction traffic will utilize Nave Drive, State Access Road, and Highway 101 to enter and exit the project site. This path of travel avoids mixing construction traffic with that of the nearby school facilities primarily accessed via Main Gate Road.

The three study intersections (Nave Drive/Main Gate Road, Nave Drive/State Access Road and Main Gate Road/"C" Street) would operate at an acceptable LOS. Further, project-

[10] The Draft Rap estimates the soil export volume to be closer to 2,800 cubic yards; however, 3,500 cubic yards was used for the traffic analysis as a more conservative estimate.

related payments into the impact fee program would facilitate funding for planned improvements, making the project's cumulative impacts also less than significant.

TABLE 8 TRIP GENERATION SUMMARY

		Daily		AM Peak Hour				PM Peak Hour			
Land Use	**Units**	**Rate**	**Trips**	**Rate**	**Trips**	**In**	**Out**	**Rate**	**Trips**	**In**	**Out**
Townhomes	31 Units	5.81	180	0.44	14	2	12	0.52	16	11	5

Source: *Trip Generation Manual,* 9th Edition, Institute of Transportation Engineers, 2012.

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Less Than Significant. As noted above, implementation of the proposed project does not result in deterioration of traffic operating conditions, including the level of service standard of LOS D for Urban and Suburban Arterials including highways that serve as arterials. The project therefore does not conflict with any standards and/or policies established by the County of Marin's Congestion Management Agency (CMA), and would result in a less-than-significant impact based on the standards established by the CMA.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

No Impact. The project does not include any elements that would generate or impede any air traffic patterns. Therefore it would have no impact on air traffic patterns.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less Than Significant. Access to the project site is proposed via two driveways; one each on Main Gate Road and "C" Street. Main Gate Road has a raised center median, so this driveway would be limited to right-turns in and out. The driveway on "C" Street would have full access and accommodate turns in both directions. Both driveways as well as the internal roadways have been designed to avoid any sharp curves and are consistent with the City of Novato's design standards. The tentative map submitted by the applicant appears to match these design standards and will be subject to the review and approval of the City's Engineering Department.

The project plans also address sight distance at the site's access driveways to and from the adjoining streets. Sight lines are clear to the east along Main Gate Road, affording drivers stopping sight distances which meet minimum standards for movements both into and out of the site. Similarly, "C" Street is straight and flat, so adequate sight lines will be available for drivers entering and exiting the site, as well as between drivers entering and those following them.

Based on review of the project plans, there would be a less-than-significant impact relative to increased hazards due to site design.

e) Result in inadequate emergency access?

Less Than Significant. Emergency access to the project site would be from either Main Gate Road or "C" Street. Either entrance would provide adequate access for emergency responders. In addition, due to the low number of project generated trips, the proposed project is expected to have minimal effect on response times for emergency vehicles. Therefore, the proposed project would have a less-than-significant impact on emergency access.

f) Conflict with adopted polices, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Less Than Significant. The project site plan shows pedestrian pathways connecting the residential units to an internal park and other units. Curb, gutter, and sidewalks already exist along the project frontage with Main Gate Road, but would be constructed on "C" Street. These facilities would improve pedestrian access in the area, especially as adjacent properties are developed and install frontage improvements.

The SMART Novato South Station is proposed to be located to the east of the project site between Main Gate Road and North Hamilton Parkway. According to SMART's project description, with implementation of the SMART project a Class I pedestrian and bicycle pathway would be constructed within SMART right-of-way (SMART, 2014). This multi-use pathway would provide a connection between the project site and the Marin Airporter Hamilton Terminal and the Grosvenor Square shopping center located to the north of the project site along North Hamilton Parkway near Nave Drive. The connection to North Hamilton Parkway would also provide a crossing point to the east side of the SMART tracks. This pathway would provide the project with convenient access for both pedestrians and bicyclists to local shopping and transit opportunities.

With construction of sidewalk along the project frontage as proposed, the project would have a less-than-significant impact on alternative transportation.

XVII. UTILITIES AND SERVICE SYSTEMS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	■	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	■	☐
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	■	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	■	☐
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	■	☐	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	■	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	■	☐

Affected Environment

An overview of the existing conditions related to wastewater, water supply, stormwater runoff, and solid waste is provided below within the responses to the checklist questions.

Discussion

a) Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Less Than Significant. The City of Novato is located within the jurisdiction boundaries of the San Francisco Bay Regional Water Quality Control Board (Regional Water Board). The Regional Water Board provides groundwater protection, wastewater discharge regulation, site cleanups, brownfields cleanups, stormwater basin planning, water quality information, enforcement, and stream and waterway protection. Under the Regional Water Board National Pollutant Discharge Elimination System (NPDES) permit system, all existing and future municipal and industrial discharges to surface waters within the City would be subject to regulation.

Wastewater from the project would be directed to existing facilities, which would continue to comply with all provisions of the NPDES program, as enforced by the Regional Water Board. Therefore, the project would not result in an exceedance of wastewater treatment requirements and the impact is less than significant.

b) Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less Than Significant. Novato Sanitary District (NSD) provides wastewater collection, treatment, and disposal services for the entire Novato community. The wastewater treatment plant is the Novato Treatment Plant, which is currently designed for an average dry weather flow of 7.05 mgd (million gallons per day) (NSD, 2008, revised 2012). In 2010, this plant was significantly upgraded and placed into service. That same year, the NSD entered into an agreement with Veolia Water to operate the district's treatment facilities on a contract basis.

North Marin Water District (NMWD) supplies water to the City of Novato and has a mutual aid relationship with NSD. In 2011, NSD and NMWD expanded a joint recycled water program and construction of new facilities was initiated at the Novato Treatment Plant to provide additional recycled water production capability.

The General Plan includes the following related policy:

> PF Program 4.2: Work with the Novato Sanitary District to ensure that wastewater is adequately collected, treated, and disposed of.

The project would generate wastewater that would be treated by NSD facilities. A new development project is required to pay a sewer connection fee, provide the fee structure for the installation and connection of sanitary sewers, regulate the discharge of waters and wastes into the public sewer systems, and provide penalties for the violations of any of these provisions (NSD, 2014a). The increase in residents that would result from the project would incrementally increase the amount of wastewater associated with the project site compared to the current vacant use. NSD has confirmed that the existing water treatment plant has sufficient capacity to serve the proposed 31-unit development and would not require the construction of new wastewater treatment facilities or the expansion of existing treatment facilities (Northcroft, 2014a). As a result, the project would have a less-than-significant impact related to wastewater treatment facilities.

c) Would the project require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less Than Significant. Surface runoff in Novato is collected in local storm drains and Pacheco Creek which feeds into Novato Creek and ultimately out into the San Pablo Bay. The General Plan includes the following objective, policies, and programs related to storm drains and runoff:

> EN Objective 10 Preserve, protect, and enhance water resources.
>
> EN Policy 35 Watershed Management. Minimize the effects of pollution in stormwater runoff. Retain and restore where feasible the natural hydrological characteristics of watersheds in the Novato Area of Interest.
>
> EN Program 35.1: Continue to implement the Clean Stormwater Ordinance. As budget allows, increase storm drain maintenance to reduce urban runoff pollutants and increase street sweeping programs.
>
> EN Policy 36 Point Source Pollution. Continue to prohibit discharges of any substances other than stormwater and prevent illicit dumping of wastes into storm drains and creeks.
>
> EN Program 36.1: Investigate reports or evidence of illicit discharges or dumping into creeks or storm drains and work with the appropriate state and local agencies to determine causes and take measures to prevent such occurrences.
>
> EN Policy 37 Using CEQA to Reduce Water Quality Impacts. Use the provisions of the California Environmental Quality Act (CEQA) process to identify measures to prevent erosion, sedimentation, and urban runoff pollution resulting from development.
>
> EN Program 37.1: Include analysis and mitigation measures to reduce the harmful effects of runoff as part of project review.

Currently, the majority of the 2.7-acre site is paved and vacant. In Hamilton Field, the General Plan specifies that flood control and storm drainage improvements are the responsibility of the applicant. The applicant would be expected to pay the City and the Marin County Flood Control and Water Conservation District for storm drainage services.

As previously stated in *Section IX, Hydrology and Water Quality*, landscaping features of the proposed project and implementation of post-construction stormwater management measures such as pervious pavement and stormwater planters are expected to result in a net increase in the amount of infiltration of precipitation and recharge of groundwater. The project, therefore, would not substantially increase the stormwater runoff nor require new or expanded facilities, and would result in a less than significant impact on the storm drainage system.

d) *Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?*

Less Than Significant. NMWD purchases approximately 80 percent of its water supply through the Sonoma County Water Agency. The water received by NMWD mostly originates from Lake Sonoma, where it is released to the Russian River via Dry Creek. About 20 percent of Novato's water supply comes from Stafford Lake in addition to a small amount of recycled water obtained in a joint program with NSD. NMWD's 61,000 customers used an average of 130 gallons per capita per day (gcpd) in 2011(Sonoma Marin Saving Water Partnership Annual Report (SMSWP), FY 2011–2012).

Both supply and demand vary seasonally and become critical during drought periods which can last several years. For planning purposes and looking to the year 2035, NMWD's combined projected water supply is sufficient to meet projected demands during normal and multiple dry-year conditions. In the event of a severe drought, however, under the single dry-year scenario, NMWD would not have sufficient supplies (NMWD, 2010). According to the "2014 City of Novato General Plan 2035 Policy White Paper on Water Availability and Conservation," despite the current three years of drought, Lake Sonoma, which is currently at 73 percent of capacity, has held up remarkably well and has the capacity to withstand multiple years of drought. It would take a significantly worse drought than there is currently for Lake Sonoma to reach 100,000 acre-feet or less of available water to trigger a 30 percent mandatory reduction in Russian River water delivery. Although that would be a significant reduction, NMWD currently only uses about 53 percent of its annual delivery available under the 2006 Restructured Agreement.

NMWD is pursuing a range of actions to reduce demand and increase supply, including through public outreach, leak fixes, irrigation reductions, infrastructure improvements, and water conservation measures. In 2011, NMWD adopted an Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Act. At the customer level, NMWD reports historic water use (between 1995 and 2004) of 178 gcpd. In 2009, SBx7-7 established the 20x2020 water use goals to reduce per capita water use 20 percent by the year 2020. As of 2014, both the NMWD and the SMSWP have met the 20 percent per capita reduction goal (City of Novato, 2014f). NMWD goals are set at 161 gcpd by 2015 and 143 gcpd by 2020 (NMWD, 2010).

The General Plan also identified the following policies and programs:

> PF Policy 5 Potable Water. Ensure adequate water supply for new and existing development.
>
> PF Program 5.1: Ensure water service agreements for new development are in place which establish a Level of Service in accordance with the regulations and ordinances of the North Marin Water District and Marin Municipal Water District.

> PF Program 5.2: Require developers to enter into agreements in accordance with the regulations and ordinances of the North Marin Water District and Marin Municipal Water District and pay for the cost of potable water infrastructure required for each project.
>
> PF Policy 6 Water Conservation. Develop and implement water conservation programs for Novato.
>
> PF Program 6.1: Adopt a Water Use Reduction in Landscaping Ordinance. Consider the use of water-saving devices for residential and commercial uses; limits to the amount of turf area in new developments; the use of drip irrigation systems; and other water conserving measures.
>
> PF Program 6.2: Use treated wastewater for irrigation of City facilities and encourage wastewater irrigation at other public and private facilities, where practicable.
>
> PF Program 6.3: Support and Encourage reclamation of wastewater for reuse wherever possible in accordance with the regulations and ordinances of the North Marin Water District and Marin Municipal Water District.

Recycled water use is a critical element of NMWD's water supply management policies. In 2007, the Deer Island Recycled Water Facility was completed and currently delivers water to StoneTree Golf Course and Novato Fire Protection District Station 62. It is anticipated this facility will offset 85 million gallons of potable water demand for landscape irrigation (NMWD, 2014a). Through an agreement with Las Gallinas Valley Sanitary District, NMWD has expanded the treatment and delivery of recycled water to the South of Novato, primarily the Hamilton Field area. In 2013, Phase 2 of the Novato Recycled Water Program began which involved the installation of almost 9,000 feet of pipeline to distribute recycled water (NMWD, 2014b). In Fiscal Year 2013, NMWD's water use efficiency programs saved approximately 370 million gallons of water (NMWD, 2014c). The District has expanded delivery of recycled water to this area; therefore, the project would be expected to use recycled water for all common area landscape irrigation at the applicant's expense (NMWD, 2013). An off-tract recycled water extension along "C" Street would also be required to allow for connection to the District's recycled water distribution main in Main Gate Road. Lastly, the NMWD requires the project conform to District Regulation 15: Mandatory Water Conservation Measures and the installation of an above-ground, reduced pressure principle (RPP) backflow prevention device (NMWD, 2013).

The project would develop new residential uses on the site, thus increasing the amount of water necessary to serve the site. NMWD indicated that construction of new water distribution facilities (water meters, fire hydrants, and pipelines) would be required before water service could be provided. The applicant would also be required to apply to the NMWD, enter into an agreement with the NMWD, and complete financial arrangements for the new facilities as a condition of permit approval (NMWD, 2013). However, NMWD has confirmed that new connections to the water supply are available to serve the proposed project and as a result, the project would have a less-than-significant impact on water supply.

e) *Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?*

Less Than Significant with Mitigation Incorporated. As described in *Section XVII.b,* NSD operates a municipal sewer system that conveys wastewater to the Novato Treatment Plant which received significant upgrades in 2010. Wastewater capacity is sufficient during normal conditions, but can become inundated during prolonged wet weather conditions. Under peak wet weather conditions, the flow design capacity is 47 mgd (Regional Water Board, 2010).

The increase in residents that would result from the project would incrementally increase the amount of wastewater generated on the project site. NSD has indicated the public sewer main is undersized and has inadequate capacity to serve this project. NSD will require the subject parcel (and tributary undeveloped parcels) to upgrade the undersized sewer main as a condition of approval for the project (Northcroft, 2014b).

> Mitigation Measure UTL-1: Prior to issuance or a grading or other building permit, the applicant shall submit improvement plans to the City for review and approval to increase the capacity of the sewer main to adequately serve the project site.

With implementation of **Mitigation Measure UTL-1**, and the improvements and ongoing planning by the City, this analysis determines that NSD would have adequate capacity to serve the project's projected wastewater demand. As a result, the project would have a less-than-significant impact on wastewater capacity.

f) *Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?*

Less Than Significant. According to the General Plan, Novato's trash is sent to the Redwood landfill in Novato. The Redwood Landfill facility has a total estimated capacity of 60,000 cubic yards. As of 2008, the landfill's total estimated used capacity was approximately 26,000 cubic yards, or 43 percent of the landfill's total capacity. The landfill has a permitted throughput of 2,300 tons per day[11] and as of 2008, it is anticipated to have sufficient capacity until 2024, its expected closure date (CalRecycle, 2014).

[11] Permitted throughput is the maximum permitted amount of waste a landfill can handle and dispose of in one day. This figure is established in the current solid waste facilities permit issued by CalRecycle.

In 2011, the NSD approved a Zero Waste Agreement with Novato Disposal that set a series of performance goals, including achieving a 60 percent diversion by 2015, 70 percent diversion by 2020, and 80 percent by 2025 (NSD, 2011). The City of Novato has adopted a number of policies and programs through its Climate Action Plan and the General Plan to further reduce solid waste generation. General Plan objectives and policies are identified below:

> EN Objective 11 Reduce the volume of solid waste generated by the City.
>
> EN Policy 38 Solid Waste Reduction. Encourage solid waste reduction methods.
>
> EN Policy 39 On-Site Recycling Areas. Require on-site areas for recycling in commercial/retail, office and multi-family residential developments as required by State law.

The increase in residents that would result from the project would incrementally increase the amount of solid waste on the project site, but it is anticipated the landfill would have sufficient capacity to serve the incremental increase and as a result, the potential impact on solid waste disposal is less than significant.

g) Would the project comply with federal, State, and local statutes and regulations related to solid waste?

Less Than Significant. State law requires a 50 percent diversion of solid waste from landfills. Marin County has a more aggressive goal of Zero Waste by 2025. In 2006, the Marin Hazardous and Solid Waste Joint Power Authority adopted the Zero Waste goal by 2025 to reduce the amount of readily recyclable and compostable materials deposited in landfills. As of 2011, Marin's diversion rate was 72 percent and in 2012, Novato Disposal had a diversion rate of 58.16 percent (Northern California Recycling Association, 2012 and NSD, 2013).

Under AB 341, the State of California mandates all multi-family residential buildings with five or more units, such as the project, to provide recycling services beginning no later than July 1, 2012 (NSD, 2014b). The project would comply with all federal, State, and local regulations regarding solid waste and, as a result, would have a less-than-significant impact regarding compliance with solid waste requirements.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	❐	■	❐	❐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	❐	❐	■	❐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	❐	■	❐	❐

Discussion

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

Less Than Significant with Mitigation Incorporated. The above analysis identifies potentially significant impacts to air quality, cultural resources, geology, hazards, hydrology, land use, and noise, which could degrade the quality of the natural environment. However, each potential impact would be mitigated to a less-than-significant level through implementation of the mitigation measures identified within in each section.

As described in *Section IV, Biological Resources*, no special status wildlife or plant species have the potential to occur within the project site and there are no sensitive habitats within or adjacent to the project site. The project site has no natural vegetation, habitat for special-status species, wetlands, or riparian habitats. Therefore, the project would not substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of a rare or endangered plant or animal.

The project site is vacant, thus the project would not eliminate important examples of major periods of California history or prehistory.

b) *Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)*

Less Than Significant. Cumulatively, the project combined with other past, present, and reasonably foreseeable future projects, would result in a physical change to the neighborhood by increasing the number of residential units in the surrounding area and adding population. For example, the increase in the residential population, as discussed in *Section XIV, Public Services*, will result in an incremental increased pressure on existing police, fire, and park services when combined with other foreseeable projects.

However, General Plan policies and mitigation measures identified in this Initial Study reduce potential cumulative impacts to less-than-significant levels. Although the project may have a cumulative contribution to the potential cumulative impacts identified in the General Plan, the contribution would not be considerable.

c) *Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?*

Less Than Significant with Mitigation Incorporated. The project would be consistent with State and federal requirements, as described in the preceding sections. Although the project would add residents and population density to the neighborhood, these changes would not create adverse neighborhood impacts, as the land uses of the project and other proposed projects are compatible with the land use designations and zoning of the neighborhood and do not exceed the level of development compatible with the neighborhood and community.

The following mitigation measures have been incorporated into the project to reduce direct and indirect adverse effects on human beings:

- Mitigation Measure AES-1 requires an exterior lighting plan to prevent light spill onto surrounding properties, sky glow, and glare.
- Mitigation Measure AIR-1 reduces air quality impacts through dust abatement measures and includes the BAAQMD Additional Construction Mitigation Measures.

- Mitigation Measure AIR-2 requires that the applicant develop a plan for the project demonstrating that the off-road equipment used to on-site to construct the project would achieve a fleet-wide average 45 percent reduction in $PM_{2.5}$ exhaust emissions or more.
- Mitigation Measure CULT-1, 2, and 3 provide a process if human remains or paleontological resources were to be discovered during construction on the project site.
- Mitigation Measure GEO-1 requires a design-level geotechnical assessment to design the project to protect residents during seismic events or due related geotechnical hazards.
- Mitigation Measure GEO-2 requires a description of required silt, mud, and siltation control measures that will be implemented during construction and necessary erosion control measures on any cut and fill slopes following construction.
- Mitigation Measure HAZ-1: The following seven-part mitigation measures would reduce potential impacts of routine hazardous materials transportation, use, or disposal during remedial activities at the project site to a less-than-significant level:
    - HAZ-1a requires the applicant provide the City with written documentation from the Regional Water Board and/or DTSC that the RAP, including a final SMP and SAP, has been approved before the City issues any permits for remediation activity at the site.
    - HAZ-1b requires the City contract with an independent, qualified environmental monitor, at the applicant's expense, to prepare a comprehensive safety and monitoring program (subject to the review and approval by the Regional Water Board, DTSC, and the City) and to be present at the site during all remedial activities before the City issues any permits for remediation activities at the site.
    - HAZ-1c requires that excavation, grading, loading, and off-hauling of any contaminated soils during the remediation phase of the project or any subsequent remedial activities only be conducted on Saturdays and Sundays when children are not present at the North Bay Children's Center, Novato Charter School, Wonder Nook Preschool, and Hamilton Elementary School. The acceptable hours of operation for such weekend work shall be 10 a.m. to 5 p.m. with permission to perform remediation activities on Sundays granted by the Community Development Director pursuant to Novato Municipal Code Section 19.22.070.
    - HAZ-1d requires the applicant contract with a third-party dust control subcontractor whose sole responsibility is to implement the dust control procedures specified in Mitigation Measure AIR-1 and the RAP.
    - HAZ-1e requires a public notice be mailed by the City on behalf of the applicant to all property owners of record within a 1,000-foot radius of the project site and

operators of all facilities serving children within this radius announcing the date of initiation of remediation activities.

- HAZ-1f requires the applicant post signs at the project site, North Bay Children's Center, Hamilton Elementary School, Novato Charter School, Wonder Nook Preschool, the community garden at Lanham Village, and the South Novato Library advising of the dates that remediation work will occur and listing contact information for: the applicant's representative, the City of Novato, the BAAQMD, the Regional Water Board, DTSC, and the project's environmental monitor.
- HAZ-1g requires the applicant conduct a post-remediation human health risk assessment (HHRA) as specified in the RAP to evaluate the post-remediation concentrations of soil, groundwater, and soil vapor contaminants at the site, including testing of any locations where soils not removed during remediation activities were previously found to contain contaminant concentrations above Regional Water Board Environmental Screening Levels for residential land uses. The HHRA shall be reviewed by the DTSC.

- Mitigation Measure HAZ-2 requires a Certificate of Completion for the RAP for the site issued by the Regional Water Board and/or DTSC and the Notice of Release or other appropriate instrument on the deed restriction as issued by the Department of the Navy that shows the deed restriction has been removed prior to the City considering approval of the proposed amendments to the General Plan, Master (Reuse) Plan, or Zoning that would allow residential uses.
- Mitigation Measure HYD-1 requires compliance with current requirements of the Construction General Permit and MS4 Permit, including preparation of a Stormwater Pollution Prevention Plan (SWPPP) and a Stormwater Control Plan (SCP) prior to the City issuing grading and construction permits.
- Mitigation Measure HYD-2 requires documentation demonstrating compliance with the City code for housing proposed within the 100-year flood zone.
- Mitigation Measure LAND-1 requires a Certificate of Completion for the RAP for the site issued by the Regional Water Board and/or DTSC and the Notice of Release or other appropriate instrument on the deed restriction as issued by the Department of the Navy that shows the deed restriction has been removed prior to the City considering approval of the proposed amendments to the General Plan, Master (Reuse) Plan, or Zoning that would allow residential uses.
- Mitigation Measure NOI-1 includes measures to maintain interior noise levels at or below 45 dBA L_{dn}.
- Mitigation Measure NOI-2 includes measures to reduce noise impacts during construction.

- Mitigation Measure UTL-1 requires the applicant to submit improvement plans to the City for review and approval to increase the capacity of the sewer main to adequately serve the project site.

These mitigation measures reduce the environmental effects which could cause substantial adverse effects on human beings, either directly or indirectly, to a less-than-significant level.

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APPENDIX A

Comment Letters on June 2015 IS/MND and Planning Commission Meeting Minutes from July 13, 2015

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 4
P.O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5528
FAX (510) 286-5559
TTY 711
www.dot.ca.gov

Serious Drought.
Help save water!

July 29, 2015

MRN101444
MRN-101-16
SCH# 2015072001

Ms. Elizabeth Dunn
City of Novato
922 Machin Avenue
Novato, CA 94945

Dear Ms. Dunn:

Main Gate Road and C Street Project – Mitigated Negative Declaration

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the project referenced above. The project consists of 31 multi-family units, 79 parking spaces, and 16,380 square feet of common space and community amenities. The project site is currently vacant and was previously developed with a gas station. The project is located approximately 0.25 mile from US 101, with the nearest State Highway System (SHS) access points 0.75 mile to the south at the Nave Drive ramps, and one mile to the north at the Ignacio Boulevard ramps.

Caltrans' new mission, vision, and goals signal a modernization of our approach to California's transportation system. We review this local development for impacts to the SHS in keeping with our mission, vision, and goals for sustainability/livability/economy, and safety/health. We provide these comments consistent with the State's smart mobility goals that support a vibrant economy, and build communities, not sprawl. The following comments are based on the Mitigated Negative Declaration.

Traffic Impacts
Please address the impact of the traffic generated by the project on northbound US 101 at the Ignacio Boulevard/Bel Marin Keys Boulevard off-ramp, the Ignacio Boulevard on-ramp, and the Nave Drive on-ramp. Also address the traffic impacts on southbound US 101 at the Bel Marin Keys off-ramp and the Ignacio Boulevard on-ramp. This analysis should also include a demonstration of the existing, as well as existing plus project, AM/PM peak hour turning volumes at all ramps and intersections in the study area.

Vehicle Trip Reduction
Caltrans encourages you to locate any needed project-related services near major mass transit centers, with connecting streets configured to facilitate walking and biking, as a means of

promoting transit use, and reducing regional vehicle miles traveled and traffic impacts to the SHS. In particular, improving headways on nearby Golden Gate Transit lines should be considered in order to reduce vehicle trips generated by the project.

Caltrans also encourages the City of Novato to develop and assess the benefits of specific Travel Demand Management measures that promote walking, bicycling and transit to reduce congestion on State facilities. These measures could include lower parking ratios, car-sharing programs, bicycle parking and showers for employees, and providing transit passes to employees, among others.

Hazardous Materials
All motor carriers and drivers involved in transportation of hazardous materials must comply with the requirements contained in federal and State regulations, and must apply for and obtain a hazardous materials transportation license from the California Highway Patrol (CHP). When transporting certain types of hazardous materials including inhalation hazards, safe routing and safe stopping places are required. A route map must be carried in the vehicle. More information is available on the website below.

http://www.dot.ca.gov/hq/traffops/trucks/ops-guide/hazard.htm

Please feel free to call or email Greg Currey at (510) 286-5623 or gregory.currey@dot.ca.gov with any questions regarding this letter.

Sincerely,

for PATRICIA MAURICE
Branch Chief
Local Development - Intergovernmental Review

c: Scott Morgan, State Clearinghouse

NORTH MARIN
WATER DISTRICT

999 Rush Creek Place
P.O. Box 146
Novato, CA 94948

PHONE
415.897.4133

FAX
415.892.8043

EMAIL
info@nmwd.com

WEB
www.nmwd.com

July 7, 2015

Community Development Department
CITY OF NOVATO
Attn: Elizabeth Dunn
75 Rowland Way, #200
Novato, CA 94945

Re: Hamilton Square
APN 157-980-05
970 "C" Street, Novato

Ladies and Gentlemen:

Construction of new water distribution facilities is required before water service can be provided to the above referenced project. The owner must apply to the District; enter into an agreement with the District and complete financial arrangements for the new facilities as a condition of permit approval. Occupancy approval shall not be granted until water service installation and sign off is complete

The District has expanded delivery of recycled water to this area. Accordingly, the onsite facilities shall be designed and constructed to use recycled water for all common area landscape irrigation, at the customer's/applicant's expense. In addition an off-tract recycled water extension along C-Street shall be required, as directed by the District, to allow for connection to the District's recycled water distribution main in Main Gate Road.

Water Conservation

The project must conform to District Regulation 15 – Mandatory Water Conservation Measures. Occupancy approval shall not be granted until compliance with water conservation measures, as applicable, can be verified. For the full scope of the required water conservation measure for both indoor fixtures/appliances and landscaping refer to Regulation 15 (section e. and f.) at www.nmwd.com. Please contact the District Water Conservation Coordinator at (415) 761-8933 if you have any question regarding clarification of required water conservation measures or plan submittal requirements.

Cross-Connection and Backflow Protection

Installation of an above-ground, reduced pressure principle (RPP) backflow prevention device at the meter is required in accordance with the District's Regulation 6 (at www.nmwd.com) and California Department of Health Regulations (Title 17). Upon installation, an inspection report (device testing) must be completed and returned to the District prior to the commencement of business activities. Please contact our Cross Connection Control Technician at (415) 761-8931, for more specific requirements.

This response regards domestic water service and potential fire protection requirements. The owner should be directed to the Novato Fire Protection District for determination of all final fire protection requirements. Should you have any questions regarding this matter, please contact our Engineering Services Representative at (415) 761-8935.

Sincerely,

Drew McIntyre
Chief Engineer

Cc: Fire Marshal
Novato Fire Protection District
95 Rowland Way
Novato, CA 94945

Rob Davidson
Thompson Development Inc.
250 Bel Marin Keys, Bldg. A
Novato, CA 94949

Hamilton Square LLC
250 Bel Marin Keys, Bldg. A
Novato, CA 94949

DM: tk
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From: Beth, Margarete@Waterboards <Margarete.Beth@waterboards.ca.gov>
Sent: Wednesday, July 08, 2015 1:10 PM
To: bbrown@novato.org
Cc: Elias, David@Waterboards; Seward, Terry@Waterboards; McGarry, Theresa@DTSC; Dalrymple, Michelle@DTSC; Nakayama Wong, Lynn@DTSC; arodgers@westyost.com; Pete Dellavalle (pdellavalle@westyost.com); edunn@novato.org; Carla Violet; Casey Clement (caseyc@thompsondevelopmentinc.com)
Subject: Thompson Development/Hamilton Square Remediation and Townhome Project

Hello Mr. Brown,

On July 6, 2015, Ms. Brigit Nevin (citizen in Hamilton) contacted me about her concerns regarding the Thompson Development/Hamilton Square Remediation and Townhome project (Project). She observed dust from the Project site blowing towards the school(s) during asbestos removal and well demolition that was conducted since April 2015. Ms. Nevin is concerned that the work was conducted without community notification and without implementing sufficient protective measures for human health and safety as the work was being conducted while children were present at the schools. Ms. Nevin is also concerned with the process and timing of CEQA as it relates to public comments and adoption of CEQA documents by the City; the process and time of rezoning the Project site for residential given the remediation work has not started; and public review of the Remediation Action Plan (RAP). I understand that she has contacted the EPA, the City of Novato, California Air Resources Board, DTSC, and Thompson Development about her concerns.

Ms. Nevin expressed concern that the City of Novato has scheduled a special meeting on July 13, 2015 to adopt the CEQA Mitigated Negative Declaration (MND) for the Project as well as rezone the Project site for residential development without public input. The City released the CEQA Initial Study (IS), and not the MND, for the Project on July 1, 2015 for public review and comments are due July 31, 2015. It is not clear if the City intends to adopt the IS or MND at the July 13, 2015 meeting before the comment period ends. In a July 6, 2015 correspondence to Ms. Nevin, the City stated that the environmental assessment (CEQA) will be considered at the Council meeting on August 4, 2015. It is not clear if the City considers the IS and MND the same document, and at which meeting the City intends to adopt the CEQA document. Please clarify the schedule for the IS, MND, and RAP.

Regarding rezoning the Project site, the public notice for the July 13, 2015 special meeting states that the City will do a general plan amendment, master plan amendment, and precise development plan amendment to rezone the Project site for residential use. The CEQA IS states on page 6 that once the RAP is approved Thompson Development will apply to DTSC and Regional Water Board to have the land use restrictions removed. This may be interpreted to mean that land use restrictions may be removed before remediation is complete. The CEQA documents should clearly and consistently explain that DTSC and Regional Water Board will not remove any land use restriction until after the remediation work is completed and it has been demonstrated, per the requirements of DTSC and the Regional Water Board, that the site is suitable for residential use. It is not clear if the City intends to rezone the Project site for residential concurrently with the implementation of the remediation project. If the City intends to start the process of rezoning the Project site to residential during remediation activities, it is recommended that the City included a qualifier in the CEQA documents and associated public meetings (and notices) that approvals as well as release of the land use restriction by the DTSC and RWQCB (as wells as the Navy) are required prior to any residential development of the Project site.

Ms. Nevin also expressed concern for the lack of public review of the Remedial Action Plan (RAP) for the Project. The IS did not include the DTSC and Regional Water Board approved RAP, which identifies the remediation activities and is considered mitigation for Project impacts. The RAP should be included along with the CEQA document for public review. Regional Water Board and DTSC staff have provided written comments on the April 2015 RAP and West Yost (consultant for Thompson Development) is in the process of revising the RAP for review by the agencies and the public. It is recommended that the City notify the public of the process and timing of public review of the RAP.

I had a conference call with DTSC and West Yost on July 7, 2015 regarding Ms. Nevins concerns and it is recommended that the City corrects the discrepancies described above, and coordinate with Thompson Development to provide more public outreach on the CEQA and rezoning process and time as well as public review of the RAP. West Yost has stated that they will coordinate with Thompson Development on Project-related activities to ensure sufficient BMPs are implemented to be protective of human health and the environment as well as adequate community notification when construction activities are scheduled to begin. Please provide us with a clear schedule for actions related to the IS, MND and RAP.

Please let me know if you have any questions.

Thank you.

Margarete "Maggie" Beth
Environmental Scientist
S.F. Bay Regional Water Quality Control Board
1515 Clay Street, 14th Floor
Oakland, CA 94612
Ph: 510:622-2338
Fx: 510-622-2501
mabeth@waterboards.ca.gov

Carla Violet

From: Elizabeth Dunn <edunn@novato.org>
Sent: Monday, July 13, 2015 3:02 PM
To: Carla Violet
Subject: FW: 970C Street & Parcel 1B

For the MND

From: Van Balen, Eric [mailto:Eric.VanBalen@McKesson.com]
Sent: Monday, July 13, 2015 2:58 PM
To: Elizabeth Dunn
Cc: Jeffrey Erkelens; bcfitting@yahoo.com; steffanie.mosebrook@gmail.com
Subject: 970C Street & Parcel 1B

Elizabeth,

I wanted to draw your attention to some of my family's concerns about the work conducted across the street from the Novato Charter School to prepare for new growth and development of the parcels in Hamilton Field. It is unclear to us that a proper environmental impact and analysis was conducted, and if so, the remediation plan to contain dangerous toxins was may have been ignored. I have had extensive dealings with remodeling an aircraft hangar (a former 1940's US Navy hangar) at the Port of Oakland, which contained asbestos and contaminated soil (primarily from oil, fuel, and other lubricants that were dumped into the soil under the hangar). This is a very similar scenario found at Hamilton Field. As you can imagine, if there is not a viable remediation plan for removing contaminated materials, people are often exposed and harmed when the materials are disturbed in the removal process. From my experience with the Port of Oakland, we were successful because we had a strong remediation plan executed by industry professionals. This was right for the people in proximity to the site, right for the environment, and quite frankly prevented a host of lawsuits from negligence and a failure to exhibit the proper duty of care when dealing with a known biohazard. The Port also made sure we provided evidence the site was free of contaminates prior to commencing with construction. It was expensive, definitely cheaper though than bad publicity, sick people, and a host of lawsuits from cutting corners and not following an approved plan.

Moving forward, I hope you consider some of the above information and consider the safety of the NCS and other local residents. Poor handling of toxic materials can have devastating consequences for all involved, especially when they are inadvertently released in the atmosphere compounding the problem and associated risks. I think all involved would be better served by increased transparency as progress moves forward on any renovations to the Hamilton area, especially when it is public knowledge of the prior contamination caused by the military across wide swaths of the base.

Respectfully,

Eric J. Van Balen

SPECIAL
Planning Commission Meeting

Location: Novato Police Department Training Room, 909 Machin

July 13, 2015

Present: Peter Tiernan, Vice Chair
Curtis Havel
Leslie Salazar
Jay Strauss
Susan Wernick

Absent: Dan Dawson, Chair
Robert Jordan

Staff Present: Elizabeth Dunn, Planning Manager
Veronica Nebb, Assistant City Attorney
Lynette Dias and Carla Violet, Urban Planning Partners
City's Environmental Consultant and Contract Planner)

CALL TO ORDER / PLEDGE OF ALLEGIANCE / ROLL CALL

At 7:04 p.m., the meeting was called to order.

APPROVAL OF FINAL AGENDA:
M/s, Strauss/Havel, Ayes: 5 (Havel, Salazar, Strauss, Tiernan, Wernick). Noes: 0, Absent 2 (Dawson, Jordan).

Commissioner Strauss wanted to understand how this meeting will be recorded. Planning Manager Dunn indicated that two digital recorders are being used, and staff is taking notes of the meeting, which will be used for the meeting minutes.

PUBLIC COMMENT: None

CONSENT CALENDAR:

1. APPROVAL OF PC MINUTES OF JUNE 1, 2015 (DD,PT,RJ,CH,LS,JS,SW)

M/s, Salazar/Strauss, with a request to discuss the outreach that was performed for the Northwest Quad neighborhood workshops. Ayes: 5 (Havel, Salazar, Strauss, Tiernan, Wernick). Noes: 0, Absent 2 (Dawson, Jordan).

CONTINUED ITEMS: None

NEW ITEMS:

1. **HAMILTON SQUARE (ED)**

PUBLIC HEARING AND POSSBLE ADOPTION OF RESOLUTIONS PROVIDING RECOMMENDATIONS ON MITIGATED NEGATIVE DECLARATION P2013-040; GENERAL PLAN AMENDMENT, MASTER PLAN AMENDMENT, PRECISE DEVELOPMENT PLAN AMENDMENT, TENTATIVE MAP, and DESIGN REVIEW
970 "C" STREET (at MAIN GATE ROAD); APN 157-980-05

Conduct a public hearing, consider and possibly take action to adopt resolutions providing recommendations to the City Council regarding: 1) an initial study and mitigated negative declaration; 2) a general plan amendment; 3) master plan amendments; 4) precise development plan amendment; 5) tentative map; and 6) design review, for a project consisting of 31 townhome-style residential units in 8 three-story buildings and 1 two-story building at 970 "C" Street, APN 157-980-05.

Planning Manager Dunn gave an overview of the project, and presented a power point of the overview.

Commissioner Strauss inquired about what actions were expected of the Planning Commission this evening.

Planning Manager Dunn stated that the original intent of staff was to receive a recommendation on only the proposed environmental document this evening since the other project entitlements cannot be approved until removal of the current deed restriction on residential use following completion of a heightened level of soil remediation due to the former gas station on the site. However, given recent concerns raised by the public regarding the proposed project, staff is recommending that the Planning Commission hear comments from the public on the environmental document and ask questions of staff and consultants. The Commission should provide any initial comments to staff and then continue the item. A subsequent community meeting will be held by the applicant to share detailed information about the site remediation work planned.

Commissioner Strauss inquired as to why the Mitigated Negative Declaration would be approved before the remediation work is actually done.

Planning Manager Dunn stated that the City's environmental document will be used by responsible agencies, the Regional Water Quality Control Board and Department of Toxic Substances Control, in their review and approval of the Remedial Action Plan (RAP). Novato is the project lead agency, and so must approve the environmental document prior to these agencies completing their processes and the Navy then removing the deed restriction, which must occur prior to the City Council approving the project and the General Plan amendment.

City Attorney Nebb added that at the time the application was being processed, City staff, the environmental consultant, the applicant and representatives of the resource agencies discussed the order in which the environmental analysis and the various agency and City approvals would have to take place. It was noted that neither the resource agencies nor the City can take action on the project without an environmental document. Therefore, it was determined that the environmental document needed to be considered and approved prior to any permit being issued for the project, including any permit for remediation activity. The resource agencies will rely on the environmental document, the RAP and its associated documents prior to issuing any permits for remedial (cleanup) work. Only after all resource agencies have completed their review, granted permits for remedial (cleanup) activity, cleanup activity completed and the deed restriction lifted would the City proceed to consider any entitlements to permit residential use of the property. Therefore, in this instance, environmental review and action on project itself have been separated.

Urban Planning Partners presentation of Initial Study:

Carla Violet of Urban Planning Partners (UPP), the City's environmental consultant, gave an overview of the Initial Study/Mitigated Negative Declaration and provided a brief power point presentation for the proposed project. The purpose of environment document is an informational document so that any agency that has to make a decision on the project will have sufficient information to make an informed decision.

Questions/Comments of Staff:

Commissioner Salazar asked if hazards had been tested for all exposure to different age groups.

UPP responded that yes, hazard evaluation includes standards for all human exposure. It was noted that the list of hazards present at the site are provided in a table in the Initial Study/Mitigated Negative Declaration. UPP also noted that the disposal site for contaminated materials is indicated in the RAP and that the City does not have jurisdiction over the approval of disposal sites.

In response to Commissioner questions UPP further noted that monitoring wells are monitored by the Water Board and that it is fairly common for residential development to take place on formerly contaminated property that has been cleaned to a residential standard.

In response to a Commissioner question regarding cancer rates, UPP advised that the EPA and Water Board standards are based on several factors including cancer rates and research and that such standards continue to evolve. Regulations in California tend to be more stringent and there are standards for protecting both workers and residents.

In response to a Commissioner question, staff noted that the school district had been invited to comment on the environmental document and the project and that the Charter School and Novato Unified School District were provided notice.

In response to a Commissioner question regarding who makes the ultimate safety determination, staff responded that the Regional Water Quality Control Board and the Department of Toxic Substances Control and ultimately the Navy make the determination regarding cleanup, health risk and the determination as to whether the land use covenant will be lifted.

Commissioner Havel asked about the location of schools across from contaminated property. Staff responded that the City has no land use authority over where schools are placed. Commissioner Havel further inquired as to what happens if the site isn't cleaned up by the developer, who cleans the site up? Staff responded that the Navy determined it was sufficiently clean for transfer for non-residential use. The land was sold by the Navy to a private entity. Staff noted that different restrictions were placed on property at Hamilton depending on the level of contamination in different areas. Based on standards, this property was determined to be clean enough for commercial but not for residential use. However, the restriction included the ability to apply to permit residential uses based upon additional cleanup activities by the private owner.

Based upon questions by Vice Chair Tiernan, staff advised that the Draft Remedial Action Plan (RAP) did go to the responsible agencies and that the public had the opportunity to comment on the RAP to those agencies independent of the CEQA process. Additional mitigation might be deemed appropriate by the resource agencies during their review and approval process.

In response to a Commissioner question regarding the ability of the City to deny the project, staff responded that since this project requires a General Plan Amendment, the City can reject this project. The City can determine that this is this is not an appropriate place for residential development. Staff further noted that approval of the City's environment document is only an approval of the environmental disclosure document. It is not an approval of the project itself, nor is it approval of the RAP or any actions under these documents.

<u>Presentation by Andy Rogers of West Yost, the developer's environmental engineering consultant</u>:

Andy Rodgers, Engineering Manager at West Yost, made a presentation to the Commission on the Draft Remedial Action Plan (RAP) prepared by his firm. A team of geologists, engineers, and toxicologists worked on the report. He noted that gasoline service stations have been remediated for years and that we have 30+ years of industry standards in evaluating these types of cleanup projects. Mr. Rodgers further noted that since this was a military base, it brings in another level of scrutiny by the federal government as well as state and regional agencies.
Mr. Rogers presented information about the history of the site, past cleanup efforts, with significantly declining levels of ground water contamination as a result, and the purpose of the RAP to bring the site to higher levels of remediation through removal of on-site soils that still have chemical traces beyond levels allowed for residential use.

In response to questions from the Commission, Mr. Rodgers and staff noted that the Water Board, DTSC and the Department of the Navy all have a role in approving the remediation plan and ensuring that the plan is followed. In addition, prior to the issuance of a grading or other permit by the City, conditions of approval will be attached which will require that the plan be followed, and that site inspection take place.

Public Comments:

Elena Belsky - Sierra Club

- Personally working on issues at Hamilton for the last 15 years. She believes that these are very complicated issues and that Hamilton is full of surprises. She recommended that the City assume the worst. She believes that an MND is not the appropriate CEQA document because it is a very complicated site. She believes an EIR would be more appropriate.

James Nevin - resident

- Showed video of the site after demolition of the former gas station showing strong winds blowing dust from the site. He stated his belief that there has been inadequate consideration to protect children and to recognize the cumulative impact of construction activities contemplated on three sides of the schools. He noted concerns regarding asbestos abatement which previously took place in removing the former gas station building without a fugitive dust plan. He stated his belief that asbestos materials were scraped off dry and removed dry, and that based on these past actions he has little faith in the RAP being enforced as well.

Stephanie Mosebrook- resident

- Expressed concern that the work be done safely and that there is an increased risk due to cumulative risk of multiple projects. She stated her opinion that the West Yost maps are out of date. She stated that the Planning Commission should not accept the recommendation to accept the CEQA document, that the City should do EIR or focused EIR on soil remediation and that the final RAP approved by Water Board should include a comprehensive Soil Management Plan and a specific Health and Safety Plan that considers children. The public review period for the City's environmental document should not begin until all components of the RAP are made public. She requested that the City compile a history of documents similar to Hamilton Fields project on the City's website.

Brigit Nevin- resident

- Stated that she is not opposed to the project but feels that it needs to be done safely. She believes another community meeting is needed and that the non-compliance of the asbestos removal needs to be addressed. She stated her belief that the Staff report and Initial Study do not address issues and that there is a need for an EIR. She expressed concern that the Draft Soil Management Plan will not be posted for another two weeks.

Marianne Husband - resident

- Expressed concern regarding the impact of the project on low income children. She noted that 65% of students at Hamilton School receive lunch assistance. She stated that children are exposed to other elements and that there are carcinogens all around the schools in this small area.

Lisa Van Balen - resident

- Expressed her support for the other speakers. She expressed concerns regarding the video showing dust blowing from the site, the height of the project, and traffic impacts.

Shannon Delgado - resident

- Expressed agreement with the previous speakers. She asked for transparency and accountability and expressed moral and ethical concerns.

Maureen Zeus - resident

- Expressed compassion with parents. She noted that from Lanham Village bedroom windows she could see demolition workers scraping asbestos off the roof of the gas station. She noted that when the structures were removed some of the activity took place when children were present at the school but that most of it was done when kids were not present. She stated she did not see watering trucks on site. She expressed distrust for the process and developer's consultant team.

Kim Stafford- resident

- Noted that he Planning Commission needs to look at what is being requested. There is a signed easement for sewer through Lanham Village for commercial use. Adjacent to this proposed residential site is Novato Unified School District owned property which is slated for a soccer field and teacher training center. She stated her belief that commercial use is best. Her objections to residential use include height, condensed development in the area of Main Gate Road & C Street and traffic concerns. She expressed safety concerns with children.

Amy Baxt

- Inquired whether the RAP considered the location of the schools, organic garden, SMART station and library. Children as young as 6-weeks old are present at the children's center. She stated that she was present during asbestos removal. She inquired as to whether the Mitigated Negative Declaration is appropriate and believes information is missing. She suggested that a focused EIR should be prepared instead.

Gretchen Taylor - resident

- Noted that as an environmental consultant she participated in preparing the Mitigated Negative Declaration for Hamilton Marketplace. She stated that she is committed to health and safety of schools and believes that there appear to be significant unavoidable impacts that would trigger the preparation of an EIR based on water quality, hazards and cumulative impacts.

Joan Goode- resident

- Believes that it would be wonderful to have something done at this site but is concerned after listening to the issues discussed tonight. She believes a full EIR is needed. She expressed concern for the general appearance of the project, 3-story homes on Main Gate and does not belief that this is a good design or a good use for the property. She expressed concerns with traffic and that there are too many amendments requested. She noted that the real estate market has changed significantly and asked that the Commission look out for interests of the community.

Marie Hoch- resident

- Stated that that there is no way to make people park in their garages and no place for bike storage. She stated that the Commission needs to look at how people live.

Pauline Yee - resident

- Expressed concerns for adequacy of disclosure to the Novato Unified School District and parents.

Marla Fields- resident

- Expressed her belief that the level of scrutiny is very high from the resource agencies. She feels that the Federal Government did good job of MTBE cleanup of Parcel 1A. But what's happened on the building demolition is appalling. She expressed concern as to whether an MND is the best document and whether an EIR would be better.

Hutch Turner- resident

- Expressed his opinion that fugitive dust was not handled properly. Remediation does not affect organic compounds- lead, minerals, and small children are the most vulnerable. He questioned whether state standard are sufficient to address issues for children. He stated his belief that the responsible people are not doing their job. He expressed concern with noticing.

Elena Belski - resident

- Questioned whether a permit was issued for demolition.
  In response, Planning Manager Dunn stated that the City did issue a demolition permit when applied for by the property owner, but this was subsequent to asbestos removal activities being carried out. The demolition permit was issued prior to the building demolition. She noted that the Bay Area Air Quality Control District issued their permit known as a J letter prior to the demolition permit being issued.

<u>Commission Questions</u>:

In response to questions from the Commission, staff stated that the City did not know asbestos removal was going on since the demolition permit was applied for subsequent to the asbestos removal. Commissioners expressed concerns with the asbestos removal process.

In response to a question regarding the decision to prepare a Mitigated Negative Declaration instead of an EIR, City Attorney Nebb explained the procedure and the CEQA process, including the requirement for substantial evidence to support the determination that one or more impacts may be significant and unmitigatable. In response to a question regarding the EIR for the Hamilton Resuse Plan, City Attorney Nebb noted that the EIR is a fairly old document and conditions have changed over time. The EIR was to support the reuse plan and is 20+ years old. Staff and the City's consultant together made a determination that a Mitigated Negative Declaration was sufficient for this project.

Staff reiterated that the Commission is not being asked to make a decision on the environmental document this evening. The components of the RAP will be published and the City will reopen the 30-day public review period to coincide with the Water Quality Board's public review period for the RAP. A community meeting will be held to discuss the asbestos removal process and the proposed soil remediation process and oversight.

Motion/Second, Havel/Strauss, to continue this item to a date uncertain 5-0-2: Ayes: Havel, Salazar, Strauss, Tiernan, Wernick. Noes: 0 . Absent: Dawson, Jordan.

GENERAL BUSINESS:

UPCOMING AGENDAS AND QUORUMS: None.

ADJOURNMENT: Adjourned by the Chair at 10:00 p.m.

APPENDIX B

Draft Remedial Action Plan Documents

(*Available electronically with the Planning Division*)

APPENDIX C

CalEEMod Input and Output Worksheets and Construction Schedule

Health Risk Calculation Methodology

A health risk assessment (HRA) for exposure to Toxic Air Contaminates (TACs) requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[1] These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by State law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.[2] This HRA used the recent 2015 OEHHA risk assessment guidelines and CARB guidance. While the OEHHA guidelines use substantially more conservative assumptions than the current Bay Area Air Quality Management District (BAAQMD) guidelines, BAAQMD has not formally adopted recommended procedures for applying the newest OEHHA guidelines. BAAQMD is in the process of developing new guidance and has developed proposed HRA Guidelines as part of the proposed amendments to Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants.[3] Exposure parameters from the OEHHA guidelines and newly proposed BAAQMD HRA Guidelines were used in this evaluation.

Cancer Risk

Potential increased cancer risk from inhalation of TACs are calculated based on the TAC concentration over the period of exposure, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency of exposure, and the exposure duration. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), and ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day). As recommended by the BAAQMD, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways).

Under previous OEHHA and BAAQMD HRA guidance, residential receptors are assumed to be at their home 24 hours a day, or 100 percent of the time. In the 2015 Risk Assessment Guidance, OEHHA includes adjustments to exposure duration to account for the fraction of time at home (FAH), which can be less than 100 percent of the time, based on updated population and activity statistics. The FAH factors are age-specific and are: 0.85 for third trimester of pregnancy to less than 2 years old, 0.72 for ages 2 to less than 16 years, and 0.73 for ages 16 to 70 years. BAAQMD recommends using these FAH factors for residential exposures.

Functionally, cancer risk is calculated using the following parameters and formulas:

Cancer Risk (per million) = $CPF \times Inhalation\ Dose \times ASF \times ED/AT \times FAH \times 10^6$

Where:

CPF = Cancer potency factor (mg/kg-day)$^{-1}$

ASF = Age sensitivity factor for specified age group

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[1] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

[2] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

[3] BAAQMD, 2016. *Workshop Report. Proposed Amendments to Air District Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants. Appendix C. Proposed Air District HRA Guidelines*. January 2016.

ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} *x DBR x A x (EF/365) x* 10^{-6}

Where:

C_{air} = concentration in air (µg/m^3)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

The health risk parameters used in this evaluation are summarized as follows:

Parameter	***Exposure Type →***	**Infant**		**Child**	**Adult**
	Age Range →	**3rd Trimester**	**0<2**	**2 < 16**	**16 - 30**
DPM Cancer Potency Factor (mg/kg-day)$^{-1}$		1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day)*		361	1,090	572	261
Inhalation Absorption Factor		1	1	1	1
Averaging Time (years)		70	70	70	70
Exposure Duration (years)		0.25	2	14	14
Exposure Frequency (days/year)		350	350	350	350
Age Sensitivity Factor		10	10	3	1
Fraction of Time at Home		0.85 – 1.0	0.72 – 1.0	0.72 – 1.0	0.73

* 95th percentile breathing rates for 3rd trimester and infants and 80th percentile for children and adults

<u>Non-Cancer Hazards</u>

Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the BAAQMD significance thresholds to determine whether a significant non-cancer health impact from a project would occur.

Typically, for residential projects located near roadways with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is diesel particulate matter (DPM). For DPM, the chronic inhalation REL is 5 micrograms per cubic meter (µg/m^3).

<u>Annual $PM_{2.5}$ Concentrations</u>

While not a TAC, fine particulate matter ($PM_{2.5}$) has been identified by the BAAQMD as a pollutant with potential non-cancer health effects that should be included when evaluating potential community health impacts under the California Environmental Quality Act (CEQA). The thresholds of significance for $PM_{2.5}$ (project level and cumulative) are in terms of an increase in the annual average concentration. When considering $PM_{2.5}$ impacts, the contribution from all sources of $PM_{2.5}$ emissions should be included. For projects with potential impacts from nearby local roadways, the $PM_{2.5}$ impacts should include those from vehicle exhaust emissions, $PM_{2.5}$ generated from vehicle tire and brake wear, and fugitive emissions from re-suspended dust on the roads.

U.S. Highway 101 Traffic Data and Emission Factors

Novato Main Gate, Novato, CA
Hwy 101 Traffic Data and PM2.5 & TOG Emission Factors - 60 mph Trucks & 65 mph Other Vehicles

Analysis Year = ***2018***

						Emission Factors				
						Diesel	All Vehicles		Gas Vehicles	
Vehicle Type	**2014 Caltrans Number Vehicles (veh/day)**	**2018 Number Vehicles (veh/day)**	**2018 Percent Diesel**	**Number Diesel Vehicles (veh/day)**	**Vehicle Speed (mph)**	**Vehicles DPM (g/VMT)**	**Total PM2.5 (g/VMT)**	**Exhaust PM2.5 (g/VMT)**	**Exhaust TOG (g/VMT)**	**Running TOG (g/VMT)**
LDA	112,215	116,704	1.32%	1,544	65	0.0207	0.0195	0.0017	0.0222	0.056
LDT	48,914	50,870	0.24%	120	65	0.0176	0.0193	0.0015	0.0299	0.111
MDT	3,852	4,006	11.13%	446	60	0.0162	0.0234	0.0024	0.0439	0.204
HDT	3,019	3,139	82.93%	2,603	60	0.0946	0.1743	0.0772	0.1751	0.198
Total	168,000	174,720	-	4,713	62.5	-	-		-	-
Mix Avg Emission Factor						**0.06103**	**0.02227**	**0.00302**	**0.02544**	**0.07568**
Increase From 2014		1.04								
Vehicles/Direction		87,360		2,357						
Avg Vehicles/Hour/Direction		**3,640**		**98**						

Traffic Data Year = ***2014***

Caltrans 2014 Traffic AADTs & 2014 Truck AADTs		Total	Truck by Axle			
	Total	Truck	2	3	4	5
Rte 101, B, Hamilton Field Road	168,000	6,871	3,852	914	229	1,876
			56.06%	13.30%	3.33%	27.30%
	Percent of Total Vehicles	4.09%	2.29%	0.54%	0.14%	1.12%

Traffic Increase per Year (%) = ***1.00%***

Novato Main Gate, Novato, CA
Highway 101 Traffic Data and PM2.5 & TOG Emission Factors - 30 mph

Analysis Year = ***2018***

						Emission Factors				
						Diesel	All Vehicles		Gas Vehicles	
Vehicle Type	**2014 Caltrans Number Vehicles (veh/day)**	**2018 Number Vehicles (veh/day)**	**2018 Percent Diesel**	**Number Diesel Vehicles (veh/day)**	**Vehicle Speed (mph)**	**Vehicles DPM (g/VMT)**	**Total PM2.5 (g/VMT)**	**Exhaust PM2.5 (g/VMT)**	**Exhaust TOG (g/VMT)**	**Running TOG (g/VMT)**
LDA	112,215	116,704	1.32%	1,544	30	0.0218	0.0199	0.0021	0.0280	0.056
LDT	48,914	50,870	0.24%	120	30	0.0188	0.0197	0.0019	0.0385	0.111
MDT	3,852	4,006	11.13%	446	30	0.0224	0.0247	0.0037	0.0643	0.204
HDT	3,019	3,139	82.93%	2,603	30	0.0597	0.1462	0.0491	0.2837	0.198
Total	167,999	174,719	-	4,713	30	-	-		-	-
Mix Avg Emission Factor						**0.04271**	**0.02220**	**0.00295**	**0.03272**	**0.07568**
Increase From 2014		1.04								
Vehicles/Direction		87,360		2,357						
Avg Vehicles/Hour/Direction		**3,640**		**98**						

Traffic Data Year = ***2014***

Caltrans 2014 Traffic AADTs & 2014 Truck AADTs		Total*	Truck by Axle			
	Total	Truck	2	3	4	5
Rte 101, B, Hamilton Field Road	168,000	6,871	3,852	914	229	1,876
			56.06%	13.30%	3.33%	27.30%
	Percent of Total Vehicles	4.09%	2.29%	0.54%	0.14%	1.12%

Traffic Increase per Year (%) = ***1.00%***

Novato Main Gate, Novato, CA
Highway 101 Traffic Data and Entrained PM2.5 Road Dust Emission Factors

$E_{2.5} = [k(sL)^{0.91} \times (W)^{1.02} \times (1-P/4N) \times 453.59$

where:

$E_{2.5}$ = $PM_{2.5}$ emission factor (g/VMT)

k = particle size multiplier (g/VMT) [$k_{PM2.5} = k_{PM10} \times (0.0686/0.4572) = 1.0 \times 0.15 = 0.15$ g/VMT][a]

sL = roadway specific silt loading (g/m^2)

W = average weight of vehicles on road (Bay Area default = 2.4 tons)[a]

P = number of days with at least 0.01 inch of precipitation in the annual averaging period

N = number of days in the annual averaging period (default = 365)

Notes: [a] CARB 2014, Miscellaneous Process Methodology 7.9, Entrained Road Travel, Paved Road Dust (Revised and updated, April 2014)

Road Type	Silt Loading (g/m^2)	Average Weight (tons)	County	No. Days ppt > 0.01"	$PM_{2.5}$ Emission Factor (g/VMT)
Freeway	0.02	2.4	Marin	66	0.00995

SFBAAB[a]

Road Type	Silt Loading (g/m^2)
Collector	0.032
Freeway	0.02
Local	0.32
Major	0.032

SFBAAB[a]

County	>0.01 inch precipitation
Alameda	61
Contra Costa	60
Marin	66
Napa	68
San Francisco	67
San Mateo	60
Santa Clara	64
Solano	54
Sonoma	69

Novato Main Gate, Novato, CA
Highway 101
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2018

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	Diesel ADT	Average Speed (mph)
NB-101	Northbound Hwy 101	N	4	491	68	20.6	0.0	2,357	Variable
SB-101	Southbound Hwy 101	S	4	487	68	20.6	0.0	2,357	Variable

2018 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - NB-101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	2.23%	53	0.0766	9	7.48%	176	0.0392	17	7.76%	183	0.0399
2	1.91%	45	0.0632	10	4.80%	113	0.0863	18	6.33%	149	0.0354
3	1.59%	38	0.0444	11	3.66%	86	0.0837	19	5.47%	129	0.0395
4	1.14%	27	0.0946	12	7.48%	176	0.0543	20	0.86%	20	0.0946
5	1.37%	32	0.0654	13	7.76%	183	0.0557	21	2.23%	53	0.0766
6	1.72%	40	0.0946	14	7.76%	183	0.0557	22	2.83%	67	0.0875
7	3.15%	74	0.0946	15	6.93%	163	0.0540	23	2.23%	53	0.0766
8	6.11%	144	0.0377	16	6.62%	156	0.0490	24	0.57%	13	0.0946
								Total		2,357	

2018 Hourly Diesel Traffic Volumes Per Direction and DPM Emissions - SB-101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	2.23%	53	0.0766	9	7.48%	176	0.0392	17	7.76%	183	0.0399
2	1.91%	45	0.0632	10	4.80%	113	0.0863	18	6.33%	149	0.0354
3	1.59%	38	0.0444	11	3.66%	86	0.0837	19	5.47%	129	0.0395
4	1.14%	27	0.0946	12	7.48%	176	0.0543	20	0.86%	20	0.0946
5	1.37%	32	0.0654	13	7.76%	183	0.0557	21	2.23%	53	0.0766
6	1.72%	40	0.0946	14	7.76%	183	0.0557	22	2.83%	67	0.0875
7	3.15%	74	0.0946	15	6.93%	163	0.0540	23	2.23%	53	0.0766
8	6.11%	144	0.0377	16	6.62%	156	0.0490	24	0.57%	13	0.0946
								Total		2,357	

Novato Main Gate, Novato, CA
Highway 101
PM2.5 & TOG Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2018

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB-101	Northbound Hwy 101	N	4	491	68	20.6	0.0	87,360	Variable
SB-101	Southbound Hwy 101	S	4	487	68	20.6	0.0	87,360	Variable

2018 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - NB-101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.09%	951	0.0262	9	7.08%	6183	0.0225	17	7.38%	6448	0.0217
2	0.38%	330	0.0325	10	4.31%	3768	0.0251	18	8.27%	7220	0.0211
3	0.29%	258	0.0281	11	4.60%	4016	0.0232	19	5.80%	5065	0.0209
4	0.18%	159	0.0463	12	5.88%	5136	0.0232	20	4.36%	3811	0.0209
5	0.46%	401	0.0275	13	6.16%	5385	0.0224	21	3.29%	2875	0.0217
6	0.84%	735	0.0296	14	6.04%	5277	0.0225	22	3.31%	2895	0.0228
7	3.75%	3277	0.0230	15	7.07%	6177	0.0217	23	2.48%	2170	0.0224
8	7.86%	6864	0.0210	16	7.22%	6311	0.0215	24	1.89%	1648	0.0208
								Total		87,360	

2018 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - SB-101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.09%	951	0.0262	9	7.08%	6183	0.0225	17	7.38%	6448	0.0217
2	0.38%	330	0.0325	10	4.31%	3768	0.0251	18	8.27%	7220	0.0211
3	0.29%	258	0.0281	11	4.60%	4016	0.0232	19	5.80%	5065	0.0209
4	0.18%	159	0.0463	12	5.88%	5136	0.0232	20	4.36%	3811	0.0209
5	0.46%	401	0.0275	13	6.16%	5385	0.0224	21	3.29%	2875	0.0217
6	0.84%	735	0.0296	14	6.04%	5277	0.0225	22	3.31%	2895	0.0228
7	3.75%	3277	0.0230	15	7.07%	6177	0.0217	23	2.48%	2170	0.0224
8	7.86%	6864	0.0210	16	7.22%	6311	0.0215	24	1.89%	1648	0.0208
								Total		87,360	

Novato Main Gate, Novato, CA
Highway 101
Entrained PM2.5 Road Dust Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2018

Group Link	Description	Direction	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Release Height (m)	ADT	Average Speed (mph)
NB-101	Northbound Hwy 101	N	4	491	68	20.6	0.0	87,360	Variable
SB-101	Southbound Hwy 101	S	4	487	68	20.6	0.0	87,360	Variable

2018 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - NB-101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.09%	951	0.0099	9	7.08%	6183	0.0099	17	7.38%	6448	0.0099
2	0.38%	330	0.0099	10	4.31%	3768	0.0099	18	8.27%	7220	0.0099
3	0.29%	258	0.0099	11	4.60%	4016	0.0099	19	5.80%	5065	0.0099
4	0.18%	159	0.0099	12	5.88%	5136	0.0099	20	4.36%	3811	0.0099
5	0.46%	401	0.0099	13	6.16%	5385	0.0099	21	3.29%	2875	0.0099
6	0.84%	735	0.0099	14	6.04%	5277	0.0099	22	3.31%	2895	0.0099
7	3.75%	3277	0.0099	15	7.07%	6177	0.0099	23	2.48%	2170	0.0099
8	7.86%	6864	0.0099	16	7.22%	6311	0.0099	24	1.89%	1648	0.0099
								Total		87,360	

2018 Hourly Traffic Volumes Per Direction and Road Dust PM2.5 Emissions - SB-101

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8	7.86%	6864	0.0099	16	7.22%	6311	0.0099	24	1.89%	1648	0.0099
								Total		87,360	

Health Risk Impacts from U.S. Highway 101

Novato Main Gate, Novato, CA - Highway 101 DPM, PM2.5 & TOG TACs
CAL3QHCR Risk Modeling Parameters and Maximum Concentrations
First Floor On-Site Receptors - 1.5 meter Receptor Heights

Receptor Information

Number of Receptors	100
Receptor Heights =	1.5 meter (1st Floor)
Receptor distances =	10 meter (33 feet) grid spacing

Meteorological Conditions

BAAQMD Baylands Hourly Met Data	2001-2005
Land Use Classification	urban
Wind speed =	variable
Wind direction =	variable

MEI Maximum Concentrations - Receptor Height = 1.5 m

Meteorological Data Year	DPM Concentration ($\mu g/m^3$) 2018	Gas Veh Exhaust TOG Concentration ($\mu g/m^3$) 2018	Gas Veh Evaporative TOG Concentration ($\mu g/m^3$) 2018
2001	0.0068	0.1136	0.3218
2002	0.0073	0.1226	0.3473
2003	0.0071	0.1173	0.3325
2004	0.0072	0.1208	0.3422
2005	0.0068	0.1141	0.3234
Average	**0.0070**	**0.1177**	**0.3334**
Maximum	**0.0073**	**0.1226**	**0.3473**

PM2.5 Concentrations

Meteorological Data Year	Maximum Total PM2.5 Concentration (μg/m3) 2018	Maximum Road Dust PM2.5 Concentration (μg/m3) 2018	Maximum Vehicle PM2.5 Concentration (μg/m3) 2018
2001	0.1367	0.0421	0.0946
2002	0.1475	0.0454	0.1022
2003	0.1412	0.0434	0.0978
2004	0.1454	0.0447	0.1007
2005	0.1374	0.0423	0.0951
Average	**0.14**	**0.04**	**0.10**
Maximum	**0.15**	**0.05**	**0.10**

Novato Main Gate, Novato, CA - Highway 101 Cancer Risks
First Floor On-Site Receptors - 1.5 meter Receptor Heights

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

ASF = Age sensitivity factor for specified age group

ED = Exposure duration (years)

AT = Averaging time for lifetime cancer risk (years)

FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$

DBR = daily breathing rate (L/kg body weight-day)

A = Inhalation absorption factor

EF = Exposure frequency (days/year)

10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Road Traffic Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Exposure Information				Cancer Risk (per million)			
		Exposure		Age	Annual Conc (ug/m3)						
Exposure		Duration		Sensitivity		TOG	TOG		TOG	TOG	
Year	Year	(years)	Age	Factor	DPM	Exhaust	Evaporative	DPM	Exhaust	Evaporative	Total
0	2018	0.25	-0.25 - 0*	10	0.0070	0.0000	0.0000	0.10	0.000	0.000	0.10
1	2018	1	1	10	0.0070	0.1177	0.3334	1.16	0.110	0.018	1.28
2	2019	1	2	10	0.0070	0.1177	0.3334	1.16	0.110	0.018	1.28
3	2020	1	3	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.20
4	2021	1	4	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.20
5	2022	1	5	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.20
6	2023	1	6	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.20
7	2024	1	7	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.202
8	2025	1	8	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.202
9	2026	1	9	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.202
10	2027	1	10	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.202
11	2028	1	11	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.202
12	2029	1	12	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.202
13	2030	1	13	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.202
14	2031	1	14	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.202
15	2032	1	15	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.202
16	2033	1	16	3	0.0070	0.1177	0.3334	0.18	0.017	0.003	0.202
17	2034	1	17	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
18	2035	1	18	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
19	2036	1	19	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
20	2037	1	20	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
21	2038	1	21	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
22	2039	1	22	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
23	2040	1	23	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
24	2041	1	24	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
25	2042	1	25	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
26	2043	1	26	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
27	2044	1	27	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
28	2045	1	28	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
29	2046	1	29	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
30	2047	1	30	1	0.0070	0.1177	0.3334	0.02	0.002	0.000	0.022
Total Increased Cancer Risk								**5.2**	**0.5**	**0.1**	**5.8**

* Third trimester of pregnancy

Novato Main Gate - Construction

Marin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	79.00	Space	0.00	31,600.00	0
Condo/Townhouse	31.00	Dwelling Unit	2.70	56,905.00	89

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	69
Climate Zone	5			**Operational Year**	2014
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Land Use - Lot acreage from project description. Square footage from project site plan.

Construction Phase - Anticipated phasing schedule provided by project applicant.

Off-road Equipment - Anticipated construction equipment list provided by project applicant.

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Trips and VMT - 1,500 tons asphalt demo (150 haul trips) + 5,000 s.f. buildind demo (23 haul trips) = 171 total demo haul trips. Project applicant expects 20 haul truck round trips during building construction (40 trips).

Demolition - 5,000 s.f. building demo

Grading - 1,200 tons soil export. 3,500 import and export during RAP work.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	90.00
tblConstructionPhase	NumDays	220.00	60.00
tblConstructionPhase	NumDays	20.00	6.00
tblConstructionPhase	NumDays	6.00	23.00
tblConstructionPhase	NumDays	6.00	20.00
tblConstructionPhase	NumDays	10.00	15.00
tblConstructionPhase	NumDays	3.00	20.00
tblConstructionPhase	PhaseEndDate	8/25/2017	8/1/2017
tblConstructionPhase	PhaseEndDate	3/29/2017	4/21/2017
tblConstructionPhase	PhaseEndDate	5/25/2015	8/31/2016
tblConstructionPhase	PhaseEndDate	12/23/2016	12/26/2016
tblConstructionPhase	PhaseEndDate	8/22/2017	7/17/2017
tblConstructionPhase	PhaseEndDate	9/28/2016	11/25/2016
tblConstructionPhase	PhaseEndDate	1/2/2017	1/4/2017
tblConstructionPhase	PhaseStartDate	4/22/2017	3/29/2017
tblConstructionPhase	PhaseStartDate	1/5/2017	1/28/2017
tblConstructionPhase	PhaseStartDate	4/23/2015	8/1/2016
tblConstructionPhase	PhaseStartDate	11/26/2016	11/29/2016
tblConstructionPhase	PhaseStartDate	8/2/2017	6/27/2017
tblConstructionPhase	PhaseStartDate	9/1/2016	10/30/2016
tblConstructionPhase	PhaseStartDate	12/27/2016	12/29/2016
tblGrading	MaterialExported	0.00	3,500.00
tblGrading	MaterialExported	0.00	1,200.00
tblGrading	MaterialImported	0.00	3,500.00
tblLandUse	LandUseSquareFeet	31,000.00	56,905.00

tblLandUse	LotAcreage	0.71	0.00
tblLandUse	LotAcreage	1.94	2.70
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.40	0.40
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.31	0.31
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	5.80
tblOffRoadEquipment	UsageHours	8.00	0.70

tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	8.00	5.30
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	4.70
tblOffRoadEquipment	UsageHours	8.00	4.70
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	5.30
tblOffRoadEquipment	UsageHours	6.00	2.00
tblOffRoadEquipment	UsageHours	8.00	4.70
tblOffRoadEquipment	UsageHours	7.00	5.20
tblTripsAndVMT	HaulingTripNumber	23.00	173.00
tblTripsAndVMT	HaulingTripNumber	0.00	40.00

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					
2015	9.9200e-003	0.1002	0.0834	1.3000e-004	4.1800e-003	4.4100e-003	8.5900e-003	8.4000e-004	4.1900e-003	5.0300e-003	0.0000	11.7895	11.7895	1.3100e-003	0.0000	11.8169
2016	0.0468	0.5043	0.4190	7.0000e-004	0.0680	0.0210	0.0890	0.0327	0.0193	0.0521	0.0000	63.9115	63.9115	8.8900e-003	0.0000	64.0982
2017	0.4883	0.6346	0.5980	1.0200e-003	0.0155	0.0419	0.0575	4.1700e-003	0.0409	0.0450	0.0000	87.3709	87.3709	0.0110	0.0000	87.6015
Total	**0.5450**	**1.2390**	**1.1004**	**1.8500e-003**	**0.0877**	**0.0674**	**0.1551**	**0.0377**	**0.0644**	**0.1021**	**0.0000**	**163.0719**	**163.0719**	**0.0212**	**0.0000**	**163.5165**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/15/2015	4/22/2015	5	6	
2	RAP Work	Grading	8/1/2016	8/31/2016	5	23	
3	Site Preparation	Site Preparation	10/30/2016	11/25/2016	5	20	
4	Grading	Grading	11/29/2016	12/26/2016	5	20	
5	Trenching	Trenching	12/29/2016	1/4/2017	5	5	
6	Building Construction	Building Construction	1/28/2017	4/21/2017	5	60	
7	Architectural Coating	Architectural Coating	3/29/2017	8/1/2017	5	90	
8	Paving	Paving	6/27/2017	7/17/2017	5	15	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.63

Acres of Paving: 0

Residential Indoor: 115,233; Residential Outdoor: 38,411; Non-Residential Indoor: 1,422; Non-Residential Outdoor: 474 (Architectural

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
RAP Work	Tractors/Loaders/Backhoes	1	5.20	97	0.37
RAP Work	Graders	0	8.00	174	0.41
RAP Work	Rubber Tired Dozers	0	8.00	255	0.40
Demolition	Concrete/Industrial Saws	2	5.80	81	0.73
Demolition	Excavators	1	5.80	162	0.38
Demolition	Rubber Tired Dozers	1	7.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Site Preparation	Graders	0	8.00	174	0.41
RAP Work	Excavators	2	5.20	162	0.38
Site Preparation	Scrapers	0	8.00	361	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
RAP Work	Plate Compactors	1	5.20	8	0.43

Grading	Graders	1	5.30	174	0.41
Grading	Rubber Tired Dozers	1	5.30	255	0.40
Grading	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Site Preparation	Rubber Tired Dozers	1	1.80	255	0.40
Building Construction	Cranes	1	0.70	226	0.29
Building Construction	Forklifts	2	4.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	2.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Grading	Excavators	1	7.00	162	0.38
Architectural Coating	Air Compressors	2	4.00	78	0.48
Paving	Cement and Mortar Mixers	1	7.00	9	0.56
Paving	Pavers	1	7.00	125	0.42
Paving	Paving Equipment	1	4.70	130	0.36
Paving	Rollers	2	4.70	80	0.38
Paving	Tractors/Loaders/Backhoes	1	4.70	97	0.37
Trenching	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Aerial Lifts	1	4.00	62	0.31

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
RAP Work	4	10.00	0.00	875.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	4	10.00	0.00	173.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	119.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	1	3.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	6	36.00	8.00	40.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	3	7.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2015

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					2.4600e-003	0.0000	2.4600e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.3500e-003	0.0701	0.0529	6.0000e-005		3.9700e-003	3.9700e-003		3.7900e-003	3.7900e-003	0.0000	5.6645	5.6645	1.2400e-003	0.0000	5.6906
Total	**7.3500e-003**	**0.0701**	**0.0529**	**6.0000e-005**	**2.4600e-003**	**3.9700e-003**	**6.4300e-003**	**3.7000e-004**	**3.7900e-003**	**4.1600e-003**	**0.0000**	**5.6645**	**5.6645**	**1.2400e-003**	**0.0000**	**5.6906**

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	2.4400e-003	0.0299	0.0288	6.0000e-005	1.4500e-003	4.3000e-004	1.8800e-003	4.0000e-004	4.0000e-004	7.9000e-004	0.0000	5.8663	5.8663	5.0000e-005	0.0000	5.8673
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	1.8000e-004	1.6700e-003	0.0000	2.7000e-004	0.0000	2.7000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2587	0.2587	1.0000e-005	0.0000	0.2590
Total	**2.5700e-003**	**0.0300**	**0.0305**	**6.0000e-005**	**1.7200e-003**	**4.3000e-004**	**2.1500e-003**	**4.7000e-004**	**4.0000e-004**	**8.6000e-004**	**0.0000**	**6.1250**	**6.1250**	**6.0000e-005**	**0.0000**	**6.1263**

3.3 RAP Work - 2016

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					4.0000e-004	0.0000	4.0000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.6800e-003	0.0928	0.0711	1.1000e-004		5.2200e-003	5.2200e-003		4.8100e-003	4.8100e-003	0.0000	9.9242	9.9242	2.9500e-003	0.0000	9.9861
Total	**8.6800e-003**	**0.0928**	**0.0711**	**1.1000e-004**	**4.0000e-004**	**5.2200e-003**	**5.6200e-003**	**6.0000e-005**	**4.8100e-003**	**4.8700e-003**	**0.0000**	**9.9242**	**9.9242**	**2.9500e-003**	**0.0000**	**9.9861**

<u>Unmitigated Construction Off-Site</u>

	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	0.0113	0.1306	0.1380	3.2000e-004	7.3200e-003	1.6500e-003	8.9700e-003	2.0100e-003	1.5200e-003	3.5300e-003	0.0000	29.3965	29.3965	2.2000e-004	0.0000	29.4011
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	4.4000e-004	6.2000e-004	5.7000e-003	1.0000e-005	1.0400e-003	1.0000e-005	1.0500e-003	2.8000e-004	1.0000e-005	2.8000e-004	0.0000	0.9576	0.9576	5.0000e-005	0.0000	0.9586
Total	**0.0117**	**0.1312**	**0.1437**	**3.3000e-004**	**8.3600e-003**	**1.6600e-003**	**0.0100**	**2.2900e-003**	**1.5300e-003**	**3.8100e-003**	**0.0000**	**30.3541**	**30.3541**	**2.7000e-004**	**0.0000**	**30.3596**

3.4 Site Preparation - 2016

<u>Unmitigated Construction On-Site</u>

	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					0.0136	0.0000	0.0136	7.4500e-003	0.0000	7.4500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7300e-003	0.0593	0.0444	5.0000e-005		3.6300e-003	3.6300e-003		3.3400e-003	3.3400e-003	0.0000	4.4320	4.4320	1.3400e-003	0.0000	4.4601
Total	**5.7300e-003**	**0.0593**	**0.0444**	**5.0000e-005**	**0.0136**	**3.6300e-003**	**0.0172**	**7.4500e-003**	**3.3400e-003**	**0.0108**	**0.0000**	**4.4320**	**4.4320**	**1.3400e-003**	**0.0000**	**4.4601**

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	1.9000e-004	2.7000e-004	2.4800e-003	1.0000e-005	4.5000e-004	0.0000	4.6000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.4163	0.4163	2.0000e-005	0.0000	0.4168
Total	**1.9000e-004**	**2.7000e-004**	**2.4800e-003**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**4.6000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.4163**	**0.4163**	**2.0000e-005**	**0.0000**	**0.4168**

3.5 Grading - 2016

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					0.0435	0.0000	0.0435	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0184	0.1996	0.1323	1.5000e-004		0.0101	0.0101		9.2500e-003	9.2500e-003	0.0000	13.8399	13.8399	4.1700e-003	0.0000	13.9276

	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
Total	**0.0184**	**0.1996**	**0.1323**	**1.5000e-004**	**0.0435**	**0.0101**	**0.0535**	**0.0223**	**9.2500e-003**	**0.0316**	**0.0000**	**13.8399**	**13.8399**	**4.1700e-003**	**0.0000**	**13.9276**

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	1.5300e-003	0.0178	0.0188	4.0000e-005	1.0000e-003	2.2000e-004	1.2200e-003	2.7000e-004	2.1000e-004	4.8000e-004	0.0000	3.9979	3.9979	3.0000e-005	0.0000	3.9985
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	3.0000e-004	4.3000e-004	3.9700e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.3000e-004	1.9000e-004	1.0000e-005	2.0000e-004	0.0000	0.6661	0.6661	3.0000e-005	0.0000	0.6668
Total	**1.8300e-003**	**0.0182**	**0.0227**	**5.0000e-005**	**1.7200e-003**	**2.3000e-004**	**1.9500e-003**	**4.6000e-004**	**2.2000e-004**	**6.8000e-004**	**0.0000**	**4.6640**	**4.6640**	**6.0000e-005**	**0.0000**	**4.6654**

3.6 Trenching - 2016

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	3.0000e-004	2.8400e-003	2.1000e-003	0.0000		2.2000e-004	2.2000e-004		2.0000e-004	2.0000e-004	0.0000	0.2559	0.2559	8.0000e-005	0.0000	0.2575
Total	**3.0000e-004**	**2.8400e-003**	**2.1000e-003**	**0.0000**		**2.2000e-004**	**2.2000e-004**		**2.0000e-004**	**2.0000e-004**	**0.0000**	**0.2559**	**0.2559**	**8.0000e-005**	**0.0000**	**0.2575**

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	1.0000e-005	2.0000e-005	1.5000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0250	0.0250	0.0000	0.0000	0.0250
Total	**1.0000e-005**	**2.0000e-005**	**1.5000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0250**	**0.0250**	**0.0000**	**0.0000**	**0.0250**

3.6 Trenching - 2017

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	4.1000e-004	3.9800e-003	3.1300e-003	0.0000		3.0000e-004	3.0000e-004		2.8000e-004	2.8000e-004	0.0000	0.3774	0.3774	1.2000e-004	0.0000	0.3798
Total	**4.1000e-004**	**3.9800e-003**	**3.1300e-003**	**0.0000**		**3.0000e-004**	**3.0000e-004**		**2.8000e-004**	**2.8000e-004**	**0.0000**	**0.3774**	**0.3774**	**1.2000e-004**	**0.0000**	**0.3798**

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	2.0000e-005	2.0000e-005	2.0000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0360	0.0360	0.0000	0.0000	0.0361
Total	**2.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0360**	**0.0360**	**0.0000**	**0.0000**	**0.0361**

3.7 Building Construction - 2017

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	0.0446	0.3657	0.2891	4.8000e-004		0.0252	0.0252		0.0246	0.0246	0.0000	41.7051	41.7051	5.1300e-003	0.0000	41.8128
Total	**0.0446**	**0.3657**	**0.2891**	**4.8000e-004**		**0.0252**	**0.0252**		**0.0246**	**0.0246**	**0.0000**	**41.7051**	**41.7051**	**5.1300e-003**	**0.0000**	**41.8128**

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	4.8000e-004	5.3700e-003	5.9700e-003	1.0000e-005	3.3000e-004	7.0000e-005	4.0000e-004	9.0000e-005	6.0000e-005	1.5000e-004	0.0000	1.3230	1.3230	1.0000e-005	0.0000	1.3232
Vendor	2.9900e-003	0.0213	0.0373	6.0000e-005	1.5300e-003	3.0000e-004	1.8300e-003	4.4000e-004	2.7000e-004	7.1000e-004	0.0000	5.0017	5.0017	4.0000e-005	0.0000	5.0025

Worker	3.6600e-003	5.1700e-003	0.0474	1.2000e-004	9.7700e-003	8.0000e-005	9.8400e-003	2.6000e-003	7.0000e-005	2.6700e-003	0.0000	8.6489	8.6489	4.2000e-004	0.0000	8.6578
Total	**7.1300e-003**	**0.0318**	**0.0907**	**1.9000e-004**	**0.0116**	**4.5000e-004**	**0.0121**	**3.1300e-003**	**4.0000e-004**	**3.5300e-003**	**0.0000**	**14.9736**	**14.9736**	**4.7000e-004**	**0.0000**	**14.9835**

3.8 Architectural Coating - 2017

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	0.4055					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0210	0.1490	0.1362	2.2000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	18.7476	18.7476	2.6700e-003	0.0000	18.8037
Total	**0.4265**	**0.1490**	**0.1362**	**2.2000e-004**		**0.0110**	**0.0110**		**0.0110**	**0.0110**	**0.0000**	**18.7476**	**18.7476**	**2.6700e-003**	**0.0000**	**18.8037**

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	1.0700e-003	1.5100e-003	0.0138	3.0000e-005	2.8500e-003	2.0000e-005	2.8700e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.5226	2.5226	1.2000e-004	0.0000	2.5252
Total	**1.0700e-003**	**1.5100e-003**	**0.0138**	**3.0000e-005**	**2.8500e-003**	**2.0000e-005**	**2.8700e-003**	**7.6000e-004**	**2.0000e-005**	**7.8000e-004**	**0.0000**	**2.5226**	**2.5226**	**1.2000e-004**	**0.0000**	**2.5252**

3.9 Paving - 2017

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	8.1300e-003	0.0820	0.0599	9.0000e-005		4.9700e-003	4.9700e-003		4.5800e-003	4.5800e-003	0.0000	8.1076	8.1076	2.4200e-003	0.0000	8.1585
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.1300e-003**	**0.0820**	**0.0599**	**9.0000e-005**		**4.9700e-003**	**4.9700e-003**		**4.5800e-003**	**4.5800e-003**	**0.0000**	**8.1076**	**8.1076**	**2.4200e-003**	**0.0000**	**8.1585**

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	3.8000e-004	5.4000e-004	4.9400e-003	1.0000e-005	1.0200e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.9009	0.9009	4.0000e-005	0.0000	0.9019
Total	**3.8000e-004**	**5.4000e-004**	**4.9400e-003**	**1.0000e-005**	**1.0200e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.9009**	**0.9009**	**4.0000e-005**	**0.0000**	**0.9019**

Novato Main Gate - Construction TAC

Marin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	79.00	Space	0.00	31,600.00	0
Condo/Townhouse	31.00	Dwelling Unit	2.70	56,905.00	89

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	69
Climate Zone	5			**Operational Year**	2014
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Land Use - Lot acreage from project description. Square footage from project site plan.

Construction Phase - Anticipated phasing schedule provided by project applicant.

Off-road Equipment - Anticipated construction equipment list provided by project applicant.

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Trips and VMT - 1,500 tons asphalt demo (150 haul trips) + 5,000 s.f. buildind demo (23 haul trips) = 171 total demo haul trips. Project applicant expects 20 haul truck round trips during building construction (40 trips). 0.3mi trip length

Demolition - 5,000 s.f. building demo

Grading - 1,200 tons soil export. 3,500 import and export during RAP work.

Construction Off-road Equipment Mitigation - Tier 2 mitigation scenario for equipment >50hp, Tier 4 portable (aerial lifts, air compressors, concrete saws, forklifts, and generators). BAAQMD fugitive dust BMPs.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2

tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	10.00	90.00
tblConstructionPhase	NumDays	220.00	60.00
tblConstructionPhase	NumDays	20.00	6.00
tblConstructionPhase	NumDays	6.00	23.00
tblConstructionPhase	NumDays	6.00	20.00
tblConstructionPhase	NumDays	10.00	15.00
tblConstructionPhase	NumDays	3.00	20.00
tblConstructionPhase	PhaseEndDate	8/25/2017	8/1/2017
tblConstructionPhase	PhaseEndDate	3/29/2017	4/21/2017
tblConstructionPhase	PhaseEndDate	5/25/2015	8/31/2016
tblConstructionPhase	PhaseEndDate	12/23/2016	12/26/2016
tblConstructionPhase	PhaseEndDate	8/22/2017	7/17/2017
tblConstructionPhase	PhaseEndDate	9/28/2016	11/25/2016
tblConstructionPhase	PhaseEndDate	1/2/2017	1/4/2017
tblConstructionPhase	PhaseStartDate	4/22/2017	3/29/2017
tblConstructionPhase	PhaseStartDate	1/5/2017	1/28/2017
tblConstructionPhase	PhaseStartDate	4/23/2015	8/1/2016
tblConstructionPhase	PhaseStartDate	11/26/2016	11/29/2016
tblConstructionPhase	PhaseStartDate	8/2/2017	6/27/2017
tblConstructionPhase	PhaseStartDate	9/1/2016	10/30/2016
tblConstructionPhase	PhaseStartDate	12/27/2016	12/29/2016
tblGrading	MaterialExported	0.00	3,500.00
tblGrading	MaterialExported	0.00	1,200.00
tblGrading	MaterialImported	0.00	3,500.00
tblLandUse	LandUseSquareFeet	31,000.00	56,905.00
tblLandUse	LotAcreage	0.71	0.00
tblLandUse	LotAcreage	1.94	2.70
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	5.80
tblOffRoadEquipment	UsageHours	8.00	0.70
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	8.00	5.30
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	4.70
tblOffRoadEquipment	UsageHours	8.00	4.70
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	8.00	5.30
tblOffRoadEquipment	UsageHours	6.00	2.00
tblOffRoadEquipment	UsageHours	7.00	5.20
tblOffRoadEquipment	UsageHours	8.00	4.70
tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripLength	20.00	0.30

tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripLength	20.00	0.30
tblTripsAndVMT	HaulingTripNumber	23.00	173.00
tblTripsAndVMT	HaulingTripNumber	0.00	40.00
tblTripsAndVMT	VendorTripLength	7.30	0.30
tblTripsAndVMT	VendorTripLength	7.30	0.30
tblTripsAndVMT	VendorTripLength	7.30	0.30
tblTripsAndVMT	VendorTripLength	7.30	0.30
tblTripsAndVMT	VendorTripLength	7.30	0.30
tblTripsAndVMT	VendorTripLength	7.30	0.30
tblTripsAndVMT	VendorTripLength	7.30	0.30
tblTripsAndVMT	VendorTripLength	7.30	0.30
tblTripsAndVMT	WorkerTripLength	12.40	0.30
tblTripsAndVMT	WorkerTripLength	12.40	0.30
tblTripsAndVMT	WorkerTripLength	12.40	0.30
tblTripsAndVMT	WorkerTripLength	12.40	0.30
tblTripsAndVMT	WorkerTripLength	12.40	0.30
tblTripsAndVMT	WorkerTripLength	12.40	0.30
tblTripsAndVMT	WorkerTripLength	12.40	0.30
tblTripsAndVMT	WorkerTripLength	12.40	0.30

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					

2015	8.6600e-003	0.0726	0.0713	6.0000e-005	2.4900e-003	3.9900e-003	6.4800e-003	3.8000e-004	3.8000e-003	4.1800e-003	0.0000	5.8978	5.8978	1.2500e-003	0.0000	5.9240
2016	0.0405	0.3678	0.3537	3.2000e-004	0.0576	0.0192	0.0768	0.0299	0.0177	0.0475	0.0000	29.8038	29.8038	8.5600e-003	0.0000	29.9836
2017	0.4858	0.6076	0.5356	8.0000e-004	4.2000e-004	0.0415	0.0419	1.2000e-004	0.0405	0.0406	0.0000	70.1611	70.1611	0.0104	0.0000	70.3799
Total	**0.5349**	**1.0480**	**0.9605**	**1.1800e-003**	**0.0605**	**0.0647**	**0.1252**	**0.0304**	**0.0619**	**0.0923**	**0.0000**	**105.8627**	**105.8627**	**0.0202**	**0.0000**	**106.2875**

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					
2015	2.6000e-003	0.0331	0.0562	6.0000e-005	1.1400e-003	7.7000e-004	1.9100e-003	9.0000e-005	7.7000e-004	8.6000e-004	0.0000	5.8978	5.8978	1.2500e-003	0.0000	5.9240
2016	0.0186	0.2750	0.3131	3.2000e-004	0.0260	7.9800e-003	0.0340	6.7600e-003	7.9700e-003	0.0147	0.0000	29.8037	29.8037	8.5600e-003	0.0000	29.9836
2017	0.4245	0.1727	0.5578	8.0000e-004	4.2000e-004	5.0600e-003	5.4800e-003	1.2000e-004	5.0600e-003	5.1800e-003	0.0000	70.1610	70.1610	0.0104	0.0000	70.3798
Total	**0.4456**	**0.4808**	**0.9271**	**1.1800e-003**	**0.0276**	**0.0138**	**0.0414**	**6.9700e-003**	**0.0138**	**0.0208**	**0.0000**	**105.8626**	**105.8626**	**0.0202**	**0.0000**	**106.2873**

	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	**16.69**	**54.12**	**3.48**	**0.00**	**54.40**	**78.65**	**66.93**	**77.06**	**77.71**	**77.48**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/15/2015	4/22/2015	5	6	
2	RAP Work	Grading	8/1/2016	8/31/2016	5	23	
3	Site Preparation	Site Preparation	10/30/2016	11/25/2016	5	20	

4	Grading	Grading	11/29/2016	12/26/2016	5	20	
5	Trenching	Trenching	12/29/2016	1/4/2017	5	5	
6	Building Construction	Building Construction	1/28/2017	4/21/2017	5	60	
7	Architectural Coating	Architectural Coating	3/29/2017	8/1/2017	5	90	
8	Paving	Paving	6/27/2017	7/17/2017	5	15	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 6.63

Acres of Paving: 0

Residential Indoor: 115,233; Residential Outdoor: 38,411; Non-Residential Indoor: 1,422; Non-Residential Outdoor: 474 (Architectural

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	2	5.80	81	0.73
Demolition	Excavators	1	5.80	162	0.38
Demolition	Rubber Tired Dozers	1	7.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	0	8.00	97	0.37
RAP Work	Excavators	2	5.20	162	0.38
RAP Work	Graders	0	8.00	174	0.41
RAP Work	Plate Compactors	1	5.20	8	0.43
RAP Work	Rubber Tired Dozers	0	8.00	255	0.40
RAP Work	Tractors/Loaders/Backhoes	1	5.20	97	0.37
Site Preparation	Graders	0	8.00	174	0.41
Site Preparation	Rubber Tired Dozers	1	1.80	255	0.40
Site Preparation	Scrapers	0	8.00	361	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Excavators	1	7.00	162	0.38
Grading	Graders	1	5.30	174	0.41
Grading	Rubber Tired Dozers	1	5.30	255	0.40
Grading	Tractors/Loaders/Backhoes	0	7.00	97	0.37

Trenching	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	0.70	226	0.29
Building Construction	Forklifts	2	4.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	2.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	4.00	62	0.31
Architectural Coating	Air Compressors	2	4.00	78	0.48
Paving	Cement and Mortar Mixers	1	7.00	9	0.56
Paving	Pavers	1	7.00	125	0.42
Paving	Paving Equipment	1	4.70	130	0.36
Paving	Rollers	2	4.70	80	0.38
Paving	Tractors/Loaders/Backhoes	1	4.70	97	0.37

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
Demolition	4	10.00	0.00	173.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT
RAP Work	4	10.00	0.00	875.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	119.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT
Trenching	1	3.00	0.00	0.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT
Building Construction	6	36.00	8.00	40.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT
Architectural Coating	3	7.00	0.00	0.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	0.30	0.30	0.30	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2015

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					2.4600e-003	0.0000	2.4600e-003	3.7000e-004	0.0000	3.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.3500e-003	0.0701	0.0528	6.0000e-005		3.9700e-003	3.9700e-003		3.7900e-003	3.7900e-003	0.0000	5.6590	5.6590	1.2400e-003	0.0000	5.6851
Total	**7.3500e-003**	**0.0701**	**0.0528**	**6.0000e-005**	**2.4600e-003**	**3.9700e-003**	**6.4300e-003**	**3.7000e-004**	**3.7900e-003**	**4.1600e-003**	**0.0000**	**5.6590**	**5.6590**	**1.2400e-003**	**0.0000**	**5.6851**

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	1.2300e-003	2.5000e-003	0.0181	0.0000	2.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2262	0.2262	1.0000e-005	0.0000	0.2263
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	9.0000e-005	2.0000e-005	3.1000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0126	0.0126	0.0000	0.0000	0.0126
Total	**1.3200e-003**	**2.5200e-003**	**0.0184**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**5.0000e-005**	**1.0000e-005**	**1.0000e-005**	**2.0000e-005**	**0.0000**	**0.2388**	**0.2388**	**1.0000e-005**	**0.0000**	**0.2389**

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					1.1100e-003	0.0000	1.1100e-003	8.0000e-005	0.0000	8.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2900e-003	0.0306	0.0378	6.0000e-005		7.5000e-004	7.5000e-004		7.5000e-004	7.5000e-004	0.0000	5.6590	5.6590	1.2400e-003	0.0000	5.6851
Total	**1.2900e-003**	**0.0306**	**0.0378**	**6.0000e-005**	**1.1100e-003**	**7.5000e-004**	**1.8600e-003**	**8.0000e-005**	**7.5000e-004**	**8.3000e-004**	**0.0000**	**5.6590**	**5.6590**	**1.2400e-003**	**0.0000**	**5.6851**

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	1.2300e-003	2.5000e-003	0.0181	0.0000	2.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2262	0.2262	1.0000e-005	0.0000	0.2263
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	9.0000e-005	2.0000e-005	3.1000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0126	0.0126	0.0000	0.0000	0.0126
Total	**1.3200e-003**	**2.5200e-003**	**0.0184**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**5.0000e-005**	**1.0000e-005**	**1.0000e-005**	**2.0000e-005**	**0.0000**	**0.2388**	**0.2388**	**1.0000e-005**	**0.0000**	**0.2389**

3.3 RAP Work - 2016

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					4.0000e-004	0.0000	4.0000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.6500e-003	0.0925	0.0709	1.1000e-004		5.2100e-003	5.2100e-003		4.8000e-003	4.8000e-003	0.0000	9.8870	9.8870	2.9400e-003	0.0000	9.9486
Total	**8.6500e-003**	**0.0925**	**0.0709**	**1.1000e-004**	**4.0000e-004**	**5.2100e-003**	**5.6100e-003**	**6.0000e-005**	**4.8000e-003**	**4.8600e-003**	**0.0000**	**9.8870**	**9.8870**	**2.9400e-003**	**0.0000**	**9.9486**

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	5.9200e-003	0.0116	0.0894	1.0000e-005	1.2000e-004	5.0000e-005	1.7000e-004	3.0000e-005	5.0000e-005	8.0000e-005	0.0000	1.1330	1.1330	2.0000e-005	0.0000	1.1335
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	3.1000e-004	8.0000e-005	1.0800e-003	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0466	0.0466	1.0000e-005	0.0000	0.0467
Total	**6.2300e-003**	**0.0117**	**0.0905**	**1.0000e-005**	**1.5000e-004**	**5.0000e-005**	**2.0000e-004**	**4.0000e-005**	**5.0000e-005**	**9.0000e-005**	**0.0000**	**1.1796**	**1.1796**	**3.0000e-005**	**0.0000**	**1.1802**

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					1.8000e-004	0.0000	1.8000e-004	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4700e-003	0.0920	0.0791	1.1000e-004		3.0600e-003	3.0600e-003		3.0600e-003	3.0600e-003	0.0000	9.8869	9.8869	2.9400e-003	0.0000	9.9486
Total	**4.4700e-003**	**0.0920**	**0.0791**	**1.1000e-004**	**1.8000e-004**	**3.0600e-003**	**3.2400e-003**	**1.0000e-005**	**3.0600e-003**	**3.0700e-003**	**0.0000**	**9.8869**	**9.8869**	**2.9400e-003**	**0.0000**	**9.9486**

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	5.9200e-003	0.0116	0.0894	1.0000e-005	1.2000e-004	5.0000e-005	1.7000e-004	3.0000e-005	5.0000e-005	8.0000e-005	0.0000	1.1330	1.1330	2.0000e-005	0.0000	1.1335
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	3.1000e-004	8.0000e-005	1.0800e-003	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0466	0.0466	1.0000e-005	0.0000	0.0467
Total	**6.2300e-003**	**0.0117**	**0.0905**	**1.0000e-005**	**1.5000e-004**	**5.0000e-005**	**2.0000e-004**	**4.0000e-005**	**5.0000e-005**	**9.0000e-005**	**0.0000**	**1.1796**	**1.1796**	**3.0000e-005**	**0.0000**	**1.1802**

3.4 Site Preparation - 2016

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					0.0136	0.0000	0.0136	7.4500e-003	0.0000	7.4500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7700e-003	0.0597	0.0447	5.0000e-005		3.6500e-003	3.6500e-003		3.3500e-003	3.3500e-003	0.0000	4.4542	4.4542	1.3400e-003	0.0000	4.4824
Total	**5.7700e-003**	**0.0597**	**0.0447**	**5.0000e-005**	**0.0136**	**3.6500e-003**	**0.0172**	**7.4500e-003**	**3.3500e-003**	**0.0108**	**0.0000**	**4.4542**	**4.4542**	**1.3400e-003**	**0.0000**	**4.4824**

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	3.0000e-005	4.7000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0203	0.0203	0.0000	0.0000	0.0203
Total	**1.3000e-004**	**3.0000e-005**	**4.7000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0203**	**0.0203**	**0.0000**	**0.0000**	**0.0203**

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					6.1000e-003	0.0000	6.1000e-003	1.6800e-003	0.0000	1.6800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7600e-003	0.0431	0.0310	5.0000e-005		1.4200e-003	1.4200e-003		1.4200e-003	1.4200e-003	0.0000	4.4542	4.4542	1.3400e-003	0.0000	4.4824
Total	**1.7600e-003**	**0.0431**	**0.0310**	**5.0000e-005**	**6.1000e-003**	**1.4200e-003**	**7.5200e-003**	**1.6800e-003**	**1.4200e-003**	**3.1000e-003**	**0.0000**	**4.4542**	**4.4542**	**1.3400e-003**	**0.0000**	**4.4824**

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	3.0000e-005	4.7000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0203	0.0203	0.0000	0.0000	0.0203

	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
Total	**1.3000e-004**	**3.0000e-005**	**4.7000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0203**	**0.0203**	**0.0000**	**0.0000**	**0.0203**

3.5 Grading - 2016

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					0.0435	0.0000	0.0435	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0184	0.1994	0.1321	1.5000e-004		0.0101	0.0101		9.2400e-003	9.2400e-003	0.0000	13.8181	13.8181	4.1700e-003	0.0000	13.9056
Total	**0.0184**	**0.1994**	**0.1321**	**1.5000e-004**	**0.0435**	**0.0101**	**0.0535**	**0.0223**	**9.2400e-003**	**0.0316**	**0.0000**	**13.8181**	**13.8181**	**4.1700e-003**	**0.0000**	**13.9056**

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	8.1000e-004	1.5800e-003	0.0122	0.0000	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	1.0000e-005	1.0000e-005	0.0000	0.1541	0.1541	0.0000	0.0000	0.1542
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	5.0000e-005	7.5000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0324	0.0324	0.0000	0.0000	0.0325
Total	**1.0200e-003**	**1.6300e-003**	**0.0129**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**4.0000e-005**	**0.0000**	**1.0000e-005**	**2.0000e-005**	**0.0000**	**0.1865**	**0.1865**	**0.0000**	**0.0000**	**0.1867**

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					0.0196	0.0000	0.0196	5.0200e-003	0.0000	5.0200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8200e-003	0.1238	0.0970	1.5000e-004		3.3300e-003	3.3300e-003		3.3300e-003	3.3300e-003	0.0000	13.8181	13.8181	4.1700e-003	0.0000	13.9056
Total	**4.8200e-003**	**0.1238**	**0.0970**	**1.5000e-004**	**0.0196**	**3.3300e-003**	**0.0229**	**5.0200e-003**	**3.3300e-003**	**8.3500e-003**	**0.0000**	**13.8181**	**13.8181**	**4.1700e-003**	**0.0000**	**13.9056**

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	8.1000e-004	1.5800e-003	0.0122	0.0000	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	1.0000e-005	1.0000e-005	0.0000	0.1541	0.1541	0.0000	0.0000	0.1542
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	5.0000e-005	7.5000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0324	0.0324	0.0000	0.0000	0.0325
Total	**1.0200e-003**	**1.6300e-003**	**0.0129**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**4.0000e-005**	**0.0000**	**1.0000e-005**	**2.0000e-005**	**0.0000**	**0.1865**	**0.1865**	**0.0000**	**0.0000**	**0.1867**

3.6 Trenching - 2016

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					

	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
Off-Road	3.0000e-004	2.8500e-003	2.1100e-003	0.0000		2.2000e-004	2.2000e-004		2.0000e-004	2.0000e-004	0.0000	0.2569	0.2569	8.0000e-005	0.0000	0.2586
Total	**3.0000e-004**	**2.8500e-003**	**2.1100e-003**	**0.0000**		**2.2000e-004**	**2.2000e-004**		**2.0000e-004**	**2.0000e-004**	**0.0000**	**0.2569**	**0.2569**	**8.0000e-005**	**0.0000**	**0.2586**

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	1.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.2200e-003	1.2200e-003	0.0000	0.0000	1.2200e-003
Total	**1.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.2200e-003**	**1.2200e-003**	**0.0000**	**0.0000**	**1.2200e-003**

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	1.3000e-004	2.6300e-003	2.0500e-003	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004	0.0000	0.2569	0.2569	8.0000e-005	0.0000	0.2586
Total	**1.3000e-004**	**2.6300e-003**	**2.0500e-003**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.2569**	**0.2569**	**8.0000e-005**	**0.0000**	**0.2586**

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	1.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.2200e-003	1.2200e-003	0.0000	0.0000	1.2200e-003
Total	**1.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.2200e-003**	**1.2200e-003**	**0.0000**	**0.0000**	**1.2200e-003**

3.6 Trenching - 2017

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	4.2000e-004	4.0000e-003	3.1400e-003	0.0000		3.0000e-004	3.0000e-004		2.8000e-004	2.8000e-004	0.0000	0.3790	0.3790	1.2000e-004	0.0000	0.3814
Total	**4.2000e-004**	**4.0000e-003**	**3.1400e-003**	**0.0000**		**3.0000e-004**	**3.0000e-004**		**2.8000e-004**	**2.8000e-004**	**0.0000**	**0.3790**	**0.3790**	**1.2000e-004**	**0.0000**	**0.3814**

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	1.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.7600e-003	1.7600e-003	0.0000	0.0000	1.7600e-003
Total	**1.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.7600e-003**	**1.7600e-003**	**0.0000**	**0.0000**	**1.7600e-003**

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	1.9000e-004	3.9500e-003	3.0700e-003	0.0000		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	0.3790	0.3790	1.2000e-004	0.0000	0.3814
Total	**1.9000e-004**	**3.9500e-003**	**3.0700e-003**	**0.0000**		**1.6000e-004**	**1.6000e-004**		**1.6000e-004**	**1.6000e-004**	**0.0000**	**0.3790**	**0.3790**	**1.2000e-004**	**0.0000**	**0.3814**

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	1.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.7600e-003	1.7600e-003	0.0000	0.0000	1.7600e-003

Total	**1.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.7600e-003**	**1.7600e-003**	**0.0000**	**0.0000**	**1.7600e-003**

3.7 Building Construction - 2017

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	0.0446	0.3657	0.2891	4.8000e-004		0.0252	0.0252		0.0246	0.0246	0.0000	41.7051	41.7051	5.1300e-003	0.0000	41.8128
Total	**0.0446**	**0.3657**	**0.2891**	**4.8000e-004**		**0.0252**	**0.0252**		**0.0246**	**0.0246**	**0.0000**	**41.7051**	**41.7051**	**5.1300e-003**	**0.0000**	**41.8128**

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	2.5000e-004	5.0000e-004	3.8900e-003	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0508	0.0508	0.0000	0.0000	0.0509
Vendor	2.1500e-003	5.4100e-003	0.0305	1.0000e-005	7.0000e-005	3.0000e-005	9.0000e-005	2.0000e-005	2.0000e-005	4.0000e-005	0.0000	0.5613	0.5613	1.0000e-005	0.0000	0.5614
Worker	2.6700e-003	6.4000e-004	9.1000e-003	1.0000e-005	2.5000e-004	1.0000e-005	2.6000e-004	7.0000e-005	1.0000e-005	8.0000e-005	0.0000	0.4212	0.4212	4.0000e-005	0.0000	0.4221
Total	**5.0700e-003**	**6.5500e-003**	**0.0435**	**2.0000e-005**	**3.3000e-004**	**4.0000e-005**	**3.6000e-004**	**9.0000e-005**	**3.0000e-005**	**1.2000e-004**	**0.0000**	**1.0333**	**1.0333**	**5.0000e-005**	**0.0000**	**1.0344**

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	5.9700e-003	0.0547	0.3037	4.8000e-004		1.7800e-003	1.7800e-003		1.7800e-003	1.7800e-003	0.0000	41.7050	41.7050	5.1300e-003	0.0000	41.8128
Total	**5.9700e-003**	**0.0547**	**0.3037**	**4.8000e-004**		**1.7800e-003**	**1.7800e-003**		**1.7800e-003**	**1.7800e-003**	**0.0000**	**41.7050**	**41.7050**	**5.1300e-003**	**0.0000**	**41.8128**

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	2.5000e-004	5.0000e-004	3.8900e-003	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0508	0.0508	0.0000	0.0000	0.0509
Vendor	2.1500e-003	5.4100e-003	0.0305	1.0000e-005	7.0000e-005	3.0000e-005	9.0000e-005	2.0000e-005	2.0000e-005	4.0000e-005	0.0000	0.5613	0.5613	1.0000e-005	0.0000	0.5614
Worker	2.6700e-003	6.4000e-004	9.1000e-003	1.0000e-005	2.5000e-004	1.0000e-005	2.6000e-004	7.0000e-005	1.0000e-005	8.0000e-005	0.0000	0.4212	0.4212	4.0000e-005	0.0000	0.4221
Total	**5.0700e-003**	**6.5500e-003**	**0.0435**	**2.0000e-005**	**3.3000e-004**	**4.0000e-005**	**3.6000e-004**	**9.0000e-005**	**3.0000e-005**	**1.2000e-004**	**0.0000**	**1.0333**	**1.0333**	**5.0000e-005**	**0.0000**	**1.0344**

3.8 Architectural Coating - 2017

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					

	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
Archit. Coating	0.4055					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0210	0.1491	0.1364	2.2000e-004		0.0110	0.0110		0.0110	0.0110	0.0000	18.7677	18.7677	2.6700e-003	0.0000	18.8238
Total	**0.4266**	**0.1491**	**0.1364**	**2.2000e-004**		**0.0110**	**0.0110**		**0.0110**	**0.0110**	**0.0000**	**18.7677**	**18.7677**	**2.6700e-003**	**0.0000**	**18.8238**

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	7.8000e-004	1.9000e-004	2.6600e-003	0.0000	7.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1229	0.1229	1.0000e-005	0.0000	0.1231
Total	**7.8000e-004**	**1.9000e-004**	**2.6600e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.1229**	**0.1229**	**1.0000e-005**	**0.0000**	**0.1231**

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	0.4055					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-003	0.0286	0.1382	2.2000e-004		3.0000e-004	3.0000e-004		3.0000e-004	3.0000e-004	0.0000	18.7676	18.7676	2.6700e-003	0.0000	18.8238
Total	**0.4082**	**0.0286**	**0.1382**	**2.2000e-004**		**3.0000e-004**	**3.0000e-004**		**3.0000e-004**	**3.0000e-004**	**0.0000**	**18.7676**	**18.7676**	**2.6700e-003**	**0.0000**	**18.8238**

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	7.8000e-004	1.9000e-004	2.6600e-003	0.0000	7.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1229	0.1229	1.0000e-005	0.0000	0.1231
Total	**7.8000e-004**	**1.9000e-004**	**2.6600e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.1229**	**0.1229**	**1.0000e-005**	**0.0000**	**0.1231**

3.9 Paving - 2017

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	8.1300e-003	0.0820	0.0599	9.0000e-005		4.9700e-003	4.9700e-003		4.5800e-003	4.5800e-003	0.0000	8.1076	8.1076	2.4200e-003	0.0000	8.1585
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.1300e-003**	**0.0820**	**0.0599**	**9.0000e-005**		**4.9700e-003**	**4.9700e-003**		**4.5800e-003**	**4.5800e-003**	**0.0000**	**8.1076**	**8.1076**	**2.4200e-003**	**0.0000**	**8.1585**

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	2.8000e-004	7.0000e-005	9.5000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0439	0.0439	0.0000	0.0000	0.0440
Total	**2.8000e-004**	**7.0000e-005**	**9.5000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0439**	**0.0439**	**0.0000**	**0.0000**	**0.0440**

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	3.9600e-003	0.0786	0.0658	9.0000e-005		2.7800e-003	2.7800e-003		2.7800e-003	2.7800e-003	0.0000	8.1076	8.1076	2.4200e-003	0.0000	8.1585
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.9600e-003**	**0.0786**	**0.0658**	**9.0000e-005**		**2.7800e-003**	**2.7800e-003**		**2.7800e-003**	**2.7800e-003**	**0.0000**	**8.1076**	**8.1076**	**2.4200e-003**	**0.0000**	**8.1585**

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	2.8000e-004	7.0000e-005	9.5000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0439	0.0439	0.0000	0.0000	0.0440

Total	**2.8000e-004**	**7.0000e-005**	**9.5000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0439**	**0.0439**	**0.0000**	**0.0000**	**0.0440**

Construction Health Risk Modeling Emissions and Risk Calculations

Novato - Main Gate, Novato, CA
With RAP Work

DPM Construction Emissions and Modeling Emission Rates

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2016-2017	Construction	0.0619	CON_DPM	123.8	0.03769	4.75E-03	10,203	4.65E-07

Construction Hours
hr/day = 9 (7am - 4pm)
days/yr = 365
hours/year = 3285

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2016-2017	Construction	0.0138	CON_DPM	27.6	0.00840	1.06E-03	10,203	1.04E-07

Construction Hours
hr/day = 9 (7am - 4pm)
days/yr = 365
hours/year = 3285

Novato - Main Gate, Novato, CA
With RAP Work

PM2.5 Fugitive Dust Construction Emissions for Modeling

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2016-2017	Construction	CON_FUG	0.0304	60.8	0.01851	2.33E-03	10,203	2.29E-07

Construction Hours
hr/day = 9 (7am - 4pm)
days/yr = 365
hours/year = 3285

PM2.5 Fugitive Dust Construction Emissions for Modeling - With Mitigation

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2016-2017	Construction	CON_FUG	0.0070	13.9	0.00424	5.35E-04	10,203	5.24E-08

Construction Hours
hr/day = 9 (7am - 4pm)
days/yr = 365
hours/year = 3285

Novato - Main Gate, Novato, CA - Health Impact Summary

Maximum Impacts at Off-Site Residential Impacts

Construction Year	UNMITIGATED					
	Maximum Concentrations		Cancer Risk (per million)		Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM2.5/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Child	Adult	(-)	($\mu g/m^3$)
2016-2017	0.0478	0.0270	**7.8**	**0.1**	**0.01**	**0.07**

Construction Year	MITIGATED					
	Maximum Concentrations		Cancer Risk (per million)		Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM2.5/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Child	Adult	(-)	($\mu g/m^3$)
2016-2017	0.0107	0.0062	**1.8**	0.03	**0.002**	**0.02**

Maximum Impacts at North Bay Children's Center - Infant Exposures

Construction Year	UNMITIGATED				
	Maximum Concentrations		Infant Cancer Risk	Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM2.5/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	(per million)	(-)	($\mu g/m^3$)
2016-2017	0.1089	0.1179	**17.9**	**0.02**	**0.23**

Construction Year	MITIGATED				
	Maximum Concentrations		Infant Cancer Risk	Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM2.5/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	(per million)	(-)	($\mu g/m^3$)
2016-2017	0.0244	0.0027	**4.0**	**0.00**	**0.03**

Novato - Main Gate, Novato, CA - Construction Impacts with RAP
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Residential Receptor Locations - 1.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			**Adult**
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			**Infant/Child**	**Adult - Exposure Information**			**Adult**		
	Exposure				**Age**	**Cancer**	**Modeled**		**Age**	**Cancer**		
Exposure	**Duration**		**DPM Conc (ug/m3)**		**Sensitivity**	**Risk**	**DPM Conc (ug/m3)**		**Sensitivity**	**Risk**	**Fugitive**	**Total**
Year	**(years)**	**Age**	**Year**	**Annual**	**Factor**	**(per million)**	**Year**	**Annual**	**Factor**	**(per million)**	**PM2.5**	**PM2.5**
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	-	-
1	1	0 - 1	2016-2017	0.0478	10	7.85	2016-2017	0.0478	1	0.14	0.0270	0.075
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00		
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**7.8**				**0.1**		

* Third trimester of pregnancy

Novato - Main Gate, Novato, CA - Construction Impacts with RAP
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Residential Receptor Locations - 4.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)	Adult - Exposure Information Modeled DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Adult Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	-	-
1	1	0 - 1	2016-2017	0.0460	10	7.56	2016-2017	0.0460	1	0.13	0.0250	0.07
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00		
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**7.6**				**0.1**		

* Third trimester of pregnancy

Novato - Main Gate, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
North Bay Children's Center - Infant Exposure

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	3rd Trimester	0 - 2	2 - 16	16 - 30
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Infant - Exposure Information DPM Conc (ug/m3) Year	Annual	Age* Sensitivity Factor	Infant Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5
2016-2017	1	2016-2017	0.1089	10	**17.9**	0.1179	0.23

* Assumes infant exposure

Novato - Main Gate, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
North Bay Children's Center - Child Exposures

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	3rd Trimester	0 - 2	2 - 16	16 - 30
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Student - Exposure Information DPM Conc (ug/m3) Year	Annual	Age* Sensitivity Factor	Student Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5
2016-2017	1	2016-2017	0.1089	3	**2.8**	0.1179	0.23

* Children assumed to be2 years of age or older

Novato - Main Gate, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Novato Charter School - School Child Exposures

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Student - Exposure Information			Student		
Exposure Year	Exposure Duration (years)	DPM Conc (ug/m3) Year	Annual	Age* Sensitivity Factor	Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5
2016-2017	1	2016-2017	0.0882	3	**2.3**	0.0593	0.148

* Students assumed to be2 years of age or older

Novato - Main Gate, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Hamilton Elementary School - School Child Exposures

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Student - Exposure Information			Student		
Exposure Year	Exposure Duration (years)	DPM Conc (ug/m3) Year	Annual	Age* Sensitivity Factor	Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5
2016-2017	1	2016-2017	0.0081	3	**0.2**	0.0061	0.014

* Students assumed to be 2 years of age or older

Novato - Main Gate, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Wonder Nook Preschool - Child Exposures

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Student - Exposure Information			Child		
Exposure Year	**Exposure Duration (years)**	**DPM Conc (ug/m3) Year**	**DPM Conc (ug/m3) Annual**	**Age* Sensitivity Factor**	**Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
2016-2017	1	2016-2017	0.0440	3	**1.1**	0.0270	0.071

* Children assumed to be 2 years of age or older

Novato - Main Gate, Novato, CA - Construction Impacts with RAP - Mitigated Emissions
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Residential Receptor Locations - 1.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information: DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)	Adult - Exposure Information: Modeled DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Adult Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	-	-
1	1	0 - 1	2016-2017	0.0107	10	1.76	2016-2017	0.0107	1	0.03	0.0062	0.017
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00		
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**1.8**				**0.03**		

* Third trimester of pregnancy

Novato - Main Gate, Novato, CA - Construction Impacts - Mitigated Emissions
Maximum DPM Cancer Risk Calculations From Construction
North Bay Children's Center - Infant Exposure

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Infant - Exposure Information			Infant		
	Exposure			**Age***	**Cancer**		
Exposure	**Duration**	**DPM Conc (ug/m3)**		**Sensitivity**	**Risk**	**Fugitive**	**Total**
Year	**(years)**	**Year**	**Annual**	**Factor**	**(per million)**	**PM2.5**	**PM2.5**
2016-2017	1	2016-2017	0.0244	10	**4.0**	0.0027	0.03

* Assumes infant exposure

Novato - Main Gate, Novato, CA - Construction Impacts - Mitigated Emissions
Maximum DPM Cancer Risk Calculations From Construction
North Bay Children's Center - Child Exposures

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Student - Exposure Information			Student		
	Exposure			**Age***	**Cancer**		
Exposure	**Duration**	**DPM Conc (ug/m3)**		**Sensitivity**	**Risk**	**Fugitive**	**Total**
Year	**(years)**	**Year**	**Annual**	**Factor**	**(per million)**	**PM2.5**	**PM2.5**
2016-2017	1	2016-2017	0.0244	3	**0.6**	0.0027	0.03

* Children assumed to be2 years of age or older

Novato - Main Gate, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Novato Charter School - School Child Exposures

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Student - Exposure Information			Student		
Exposure Year	**Exposure Duration (years)**	**DPM Conc (ug/m3) Year**	**Annual**	**Age* Sensitivity Factor**	**Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
2016-2017	1	2016-2017	0.0197	3	**0.5**	0.0136	0.033

* Students assumed to be2 years of age or older

Novato - Main Gate, Novato, CA - Construction Impacts - Mitigated Emissions
Maximum DPM Cancer Risk Calculations From Construction
Hamilton Elementary School - School Child Exposures

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Student - Exposure Information			Student		
Exposure Year	**Exposure Duration (years)**	**DPM Conc (ug/m3) Year**	**Annual**	**Age* Sensitivity Factor**	**Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
2016-2017	1	2016-2017	0.0018	3	**0.05**	0.0014	0.003

* Students assumed to be 2 years of age or older

Novato - Main Gate, Novato, CA - Construction Impacts - Mitigated Emissions
Maximum DPM Cancer Risk Calculations From Construction
Wonder Nook Preschool - Child Exposures

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

		Student - Exposure Information			Child		
Exposure Year	**Exposure Duration (years)**	**DPM Conc (ug/m3) Year**	**Annual**	**Age* Sensitivity Factor**	**Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
2016-2017	1	2016-2017	0.0200	3	**0.5**	0.0062	0.026

* Children assumed to be 2 years of age or older

Cumulative Construction Health Risk Modeling Emissions and Risk Calculations

Novato - Main Gate, Novato, CA
Cumulative Sources Construction Emissions

DPM Construction Emissions and Modeling Emission Rates - 801 State Access Road

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2016	Construction	0.03	CON_DPM	60.0	0.01826	2.30E-03	5,728	4.02E-07
2017	Construction	0.04	CON_DPM	80.0	0.02435	3.07E-03	5,728	5.36E-07
2018	Construction	0.01	CON_DPM	20.0	0.00609	7.67E-04	5,728	1.34E-07

Construction Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

PM2.5 Fugitive Dust Construction Emissions for Modeling - 801 State Access Road

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2016	Construction	CON_FUG	0.05	100.0	0.03044	3.84E-03	5,728	6.70E-07
2017	Construction	CON_FUG	0.00	0.0	0.00000	0.00E+00	5,728	0.00E+00
2018	Construction	CON_FUG	0.00	0.0	0.00000	0.00E+00	5,728	0.00E+00

Construction Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

DPM Construction Emissions and Modeling Emission Rates - Hamilton Cottages

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2017	Construction	0.1407	CON_DPM	281.4	0.08566	1.08E-02	6,181	1.75E-06

Construction Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

PM2.5 Fugitive Dust Construction Emissions for Modeling - Hamilton Cottages

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2017	Construction	CON_FUG	0.0081	16.2	0.00494	6.22E-04	6,181	1.01E-07

Construction Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

801 State Access, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Maximum Residential Receptor - 1.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult		
	Exposure				Age	Cancer	Modeled		Age	Cancer		
Exposure	Duration		DPM Conc (ug/m3)		Sensitivity	Risk	DPM Conc (ug/m3)		Sensitivity	Risk	Fugitive	Total
Year	(years)	Age	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)	PM2.5	PM2.5
0	0.25	-0.25 - 0*	2016	0.0029	10	0.040	2016	0.0029	-	-	-	-
1	1	0 - 1	2016	0.0029	10	0.48	2016	0.0029	1	0.01	0.0084	0.011
2	1	1 - 2		0.0039	10	0.64	2017	0.0039	1	0.01	0.0000	0.004
3	1	2 - 3		0.0010	3	0.03	2018	0.0010	1	0.00	0.0000	0.001
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**1.2**				**0.02**		

* Third trimester of pregnancy

801 State Access, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Maximum Child Receptor - 1.25 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)	Adult - Exposure Information Modeled DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Adult Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	-	-
1	1	0 - 1	2016	0.0017	10	0.28	2016	0.0017	1	0.00	0.0034	0.005
2	1	1 - 2	2017	0.0023	10	0.38	2017	0.0023	1	0.01	0.0000	0.002
3	1	2 - 3	2018	0.0006	3	0.01	2018	0.0006	1	0.00	0.0000	0.001
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**0.7**				**0.01**		

* Third trimester of pregnancy

Hamilton Cottages, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Maximum Residential Receptor - 1.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult		
	Exposure				Age	Cancer	Modeled		Age	Cancer		
Exposure	Duration		DPM Conc (ug/m3)		Sensitivity	Risk	DPM Conc (ug/m3)		Sensitivity	Risk	Fugitive	Total
Year	(years)	Age	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)	PM2.5	PM2.5
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	-	-
1	1	0 - 1	2017	0.0199	10	3.26	2017	0.0199	1	0.06	0.0013	0.02
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00		
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**3.3**				**0.06**		

* Third trimester of pregnancy

Hamilton Cottages, Novato, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Maximum Child Receptor - 1.25 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult		
	Exposure				Age	Cancer	Modeled		Age	Cancer		
Exposure	Duration		DPM Conc (ug/m3)		Sensitivity	Risk	DPM Conc (ug/m3)		Sensitivity	Risk	Fugitive	Total
Year	(years)	Age	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)	PM2.5	PM2.5
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	-	-
1	1	0 - 1	2017	0.0063	10	1.04	2017	0.0063	1	0.02	0.0005	0.01
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00		
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00		
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00		
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00		
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00		
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00		
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00		
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00		
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00		
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00		
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00		
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00		
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00		
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00		
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**1.0**				**0.02**		

* Third trimester of pregnancy

APPENDIX D

Cultural Resources Survey

A Cultural Resources Survey for the Novato Main Gate Project at Main Gate and C Street Novato, Marin County, California

Virginia Ton, B.A.
and
Janine Origer, M.A. / R.P.A.

April 25, 2014

A Cultural Resources Survey for the Novato Main Gate Project at Main Gate and C Street Novato, Marin County, California

Prepared by:

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and
Janine Origer, M.A. / R.P.A.

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Prepared for:

Urban Planning Partners
505 17th Street, 2nd Floor
Oakland, CA 94612

April 25, 2014

ABSTRACT

Tom Origer & Associates conducted a cultural resources survey for the Novato Main Gate Project, Main Gate Road and C Street, Novato, Marin County, California. The study was prepared at the request of Jean Eisberg, Urban Planning Partners, and was designed to satisfy requirements of the City of Novato and the California Environmental Quality Act.

This study included archival research at the Northwest Information Center, Sonoma State University (NWIC File No. 13-1562), examination of the library and files of Tom Origer & Associates, contact with Native American representatives, and field inspection of the study area.

Field survey found no prehistoric or historical resources within the study area. Documentation pertaining to this study is on file at the offices of Tom Origer & Associates (File No. 14-35).

Confidentiality Statement: *This report contains information regarding locations of archaeological resources. These resources are vulnerable to vandalism, and are protected by law. To safeguard these resources, this report should not be circulated publicly.*

Synopsis

Project:	Novato Main Gate
Location:	Main Gate Road & C Street, Novato, Marin County, California
Quadrangle:	Novato, California 7.5’ series
Study Type:	Intensive survey
Scope:	~2.7 acres
Finds:	None

Project Personnel

Janine M. Origer provided project oversight. Ms. Origer has 30 years experience working in Northern California cultural resources management. She has been with Tom Origer & Associates since 1991. She has worked on both prehistoric and historical archaeological sites, and has completed research and documentation of historical buildings. Ms. Origer has a Bachelor of Arts in Anthropology from Sonoma State University. She holds a Master of Arts in Archaeology and Heritage from the University of Leicester. She has completed extensive continuing education in regulatory compliance, planning local surveys, and identifying historical resources. She is affiliated with the California Historical Society, International Association for Obsidian Studies, Society for American Archaeology, Society of Architectural Historians, Society for California Archaeology (Secretary of the Executive Board 2004-2006), Society for Historical Archaeology, Vernacular Architecture Forum, and the Register of Professional Archaeologists (#1066030).

Virginia Ton conducted the field work and prepared the report for this project. Mrs. Ton has been with Tom Origer & Associates since May 2010. She holds a Bachelor of Arts in Anthropology from Sonoma State University. She is affiliated with the Society for California Archaeology.

CONTENTS

FIGURES

INTRODUCTION

Tom Origer & Associates conducted a cultural resources survey for the Novato Main Gate project located at Main Gate Road and C Street, Novato, Marin County, California (Figure 1). The study was completed at the request of Jean Eisberg, Urban Planning Partners. The study was designed to satisfy requirements of the California Environmental Quality Act and those of the City of Novato. Documentation pertaining to this study is on file at Tom Origer & Associates (File No. 14-35).

REGULATORY CONTEXT

The California Environmental Quality Act (CEQA) requires that cultural resources be considered during the environmental review process. This is accomplished by an inventory of resources within a study area and by assessing the potential that cultural resources could be affected by development.

This cultural resources survey was designed to satisfy environmental issues specified in the CEQA and its guidelines (Title 14 CCR §15064.5) by: (1) identifying all cultural resources within the project area; (2) offering a preliminary significance evaluation of the identified cultural resources; (3) assessing resource vulnerability to effects that could arise from project activities; and (4) offering suggestions designed to protect resource integrity, as warranted.

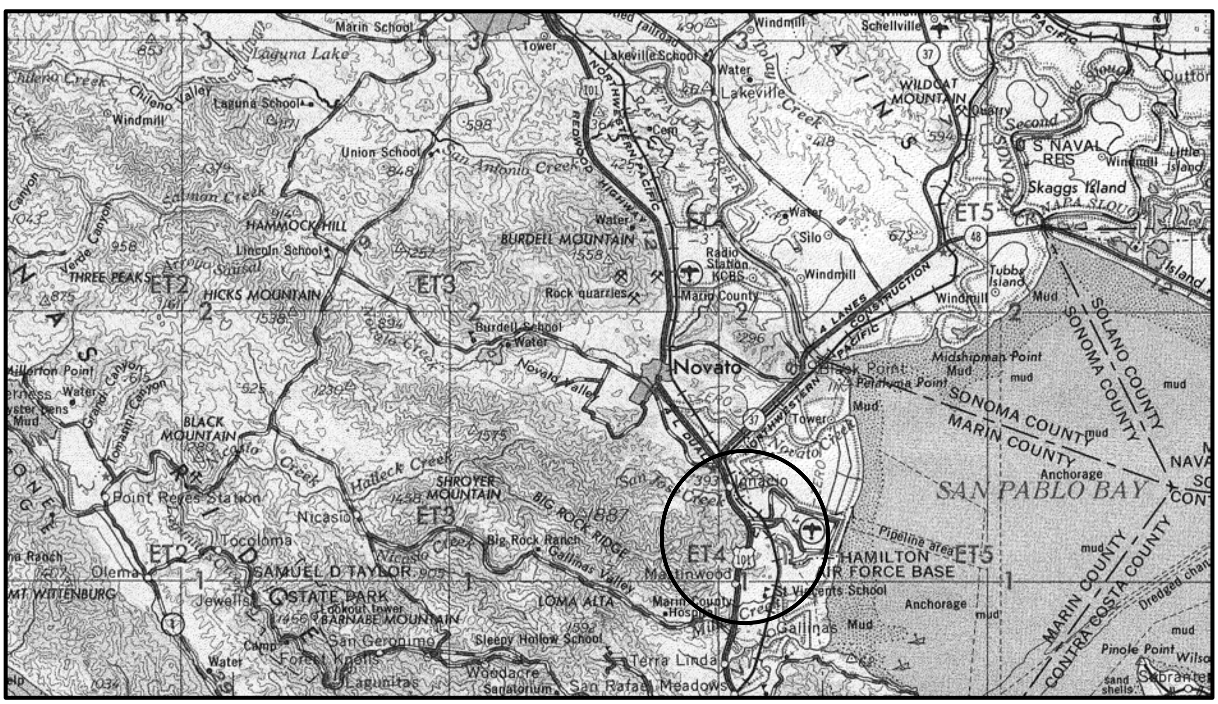

Figure 1. Project vicinity (adapted from the 1970 Santa Rosa 1:250,000-scale USGS map).

Resource Definitions

Cultural resources are classified by the State Office of Historic Preservation (OHP) as sites, buildings, structures, objects and districts, and each is described by OHP (1995) as follows.

> **Site.** A site is the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archaeological value regardless of the value of any existing structure.
>
> **Building.** A building, such as a house, barn, church, hotel, or similar construction, is created principally to shelter any form of human activity. "Building" may also be used to refer to a historically and functionally related unit, such as a courthouse and jail, or a house and barn.
>
> **Structure.** The term "structure" is used to distinguish from buildings those functional constructions made usually for purposes other than creating human shelter.
>
> **Object.** The term "object" is used to distinguish from buildings and structures those constructions that are primarily artistic in nature or are relatively small in scale and simply constructed. Although it may be, by nature or design, movable, an object is associated with a specific setting or environment.
>
> **District.** A district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.

Significance Criteria

When a project might affect a cultural resource, the project proponent is required to conduct an assessment to determine whether the effect may be one that is significant. Consequently, it is necessary to determine the importance of resources that could be affected. The importance of a resource is measured in terms of criteria for inclusion on the California Register of Historical Resources (Title 14 CCR, §4852) as listed below. A resource may be important if it meets any one of the criteria below, or if it is already listed on the California Register of Historical Resources or a local register of historical resources.

An important historical resource is one which:

1. Is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

2. Is associated with the lives of persons important to local, California, or national history.

3. It embodies the distinctive characteristics of a type, period, region or method of construction, or represents the work of a master or possesses high artistic values.

4. It has yielded, or may be likely to yield, information important to the pre-history or history of the local area, California, or the nation.

In addition to meeting one or more of the above criteria, eligibility for the California Register requires that a resource retains sufficient integrity to convey a sense of its significance or importance. Seven elements are considered key in considering a property's integrity: location, design, setting, materials, workmanship, feeling, and association.

The OHP advocates that all historical resources over 45 years old be recorded for inclusion in the OHP filing system (OHP 1995:2), although the use of professional judgment is urged in determining whether a resource warrants documentation.

PROJECT SETTING

Study Area Location and Description

The study area is located in eastern Marin County, near Hamilton Field, as shown on the Novato, California 7.5' USGS topographic map (Figure 2). The study area consists of approximately 2.7 acres of developed, flat land. The nearest source of fresh water is an intermittent stream along the western boundary of the study area.

Soils mapped within the study area are of the Xerorthents-Urban land complex (Kashiwagi 1985:Sheet 9). These soil complexes are typically found on valley floors, cut toe slopes, and on tide lands or in bay areas covered with fill (Kashiwagi 1985:78-79). Xerorthents soils are cut/fill areas that vary greatly in depth and drainage, which are commonly intermixed with development debris (Kashiwagi 1985:78-79). Urban land consists of areas covered by roads, houses, and other similar development. Parcels consisting of these soils have been used historically for urban development.

Cultural Setting

Archaeological evidence indicates that human occupation of California began at least 11,000 years ago (Erlandson et al. 2007:59). Early occupants in the San Francisco Bay Area appear to have had an economy based largely on hunting, with limited exchange, and social structures based on extended family units (Milliken *et al.* 2007:99-123). Later, milling technology (e.g., mortars and pestles) and an inferred acorn economy were introduced. This diversification of economy appears coeval with the development of sedentism, population growth, and expansion. Sociopolitical complexity and status distinctions based on wealth are also observable in the archaeological record, as evidenced by an increased range and distribution of trade goods (e.g., shell beads, obsidian tool stone), which are possible indicators of both status and increasingly complex exchange systems.

At the time of European settlement, the study area was included in the territory controlled by the Coast Miwok (Kelly 1978:414). The Coast Miwok were hunter-gatherers who lived in rich environments that allowed for dense populations with complex social structures (Barrett 1908; Kroeber 1925). They settled in large, permanent villages about which were distributed seasonal camps and task-specific sites. Primary village sites were occupied throughout the year, and other sites were visited in order to procure particular resources that were especially abundant or available only during certain seasons. Sites often were situated near fresh water sources and in ecotones where plant life and animal life were diverse and abundant.

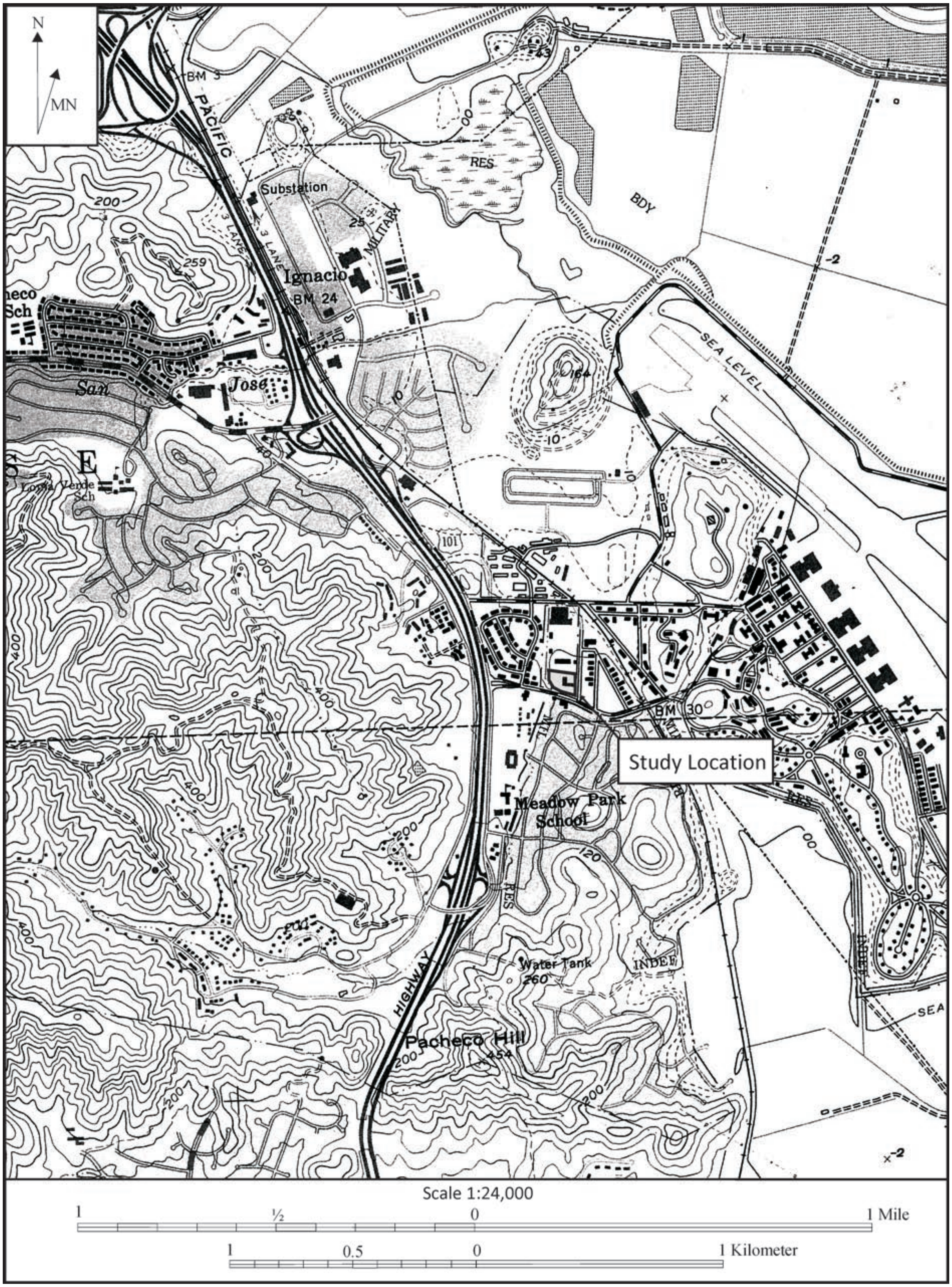

Figure 2. Study location (adapted from the USGS 1954 [photorevised 1980] Novato 7.5' map).

STUDY PROCEDURES AND FINDINGS

Native American Contact

A letter was sent to the State of California's Native American Heritage Commission seeking information from the sacred lands files, which track Native American cultural resources, and the names of Native American individuals and groups that would be appropriate to contact regarding this project. Letters were also sent to the Federated Indians of Graton Rancheria. No responses have been received as of the date of this report. A log of contact efforts is provided at the end of this report (Appendix A), along with copies of correspondence.

Archival Study Procedures

Archival research included examination of the library and project files at Tom Origer & Associates. A review (NWIC File No. 13-1562) was completed of the archaeological site base maps and records, survey reports, and other materials on file at the Northwest Information Center (NWIC), Sonoma State University, Rohnert Park. Sources of information included but were not limited to the current listings of properties on the National Register of Historic Places (National Register), California Historical Landmarks, California Register of Historical Resources (California Register), and California Points of Historical Interest as listed in the Office of Historic Preservation's *Historic Property Directory* (OHP 2012).

The Office of Historic Preservation has determined that structures older than 45 years should be considered potentially important historical resources, and former building and structure locations could be potentially important historic archaeological sites. Archival research included an examination of historical maps to gain insight into the nature and extent of historical development in the general vicinity, and especially within the study area. Maps ranged from hand-drawn maps of the 1800s (e.g., GLO plats) to topographic maps issued by the United States Geological Survey (USGS) and the Army Corps of Engineers (USACE) from the early to the middle 20th century.

In addition, ethnographic literature that describes appropriate Native American groups, county histories, and other primary and secondary sources were reviewed. Sources reviewed are listed in the "Materials Consulted" section of this report.

Archival Study Findings

Archival research found that two studies cover Hamilton Field, including the current study area (ACRS 1987a; Maniery 1992). Seventeen other studies have been conducted within a quarter-mile radius of the study area. The nearest recorded cultural resource is a portion of the railroad, about one-eighth of a mile to the northeast. No other resources are recorded within a quarter-mile radius of the study area.

The ethnographic village of pūyū'kū was reported as being either one mile south of Ignacio or near Pacheco, five miles southwest of Ignacio (Barrett 1908; Kelly 1978; and Kroeber 1925). If the first report is accurate, it is possible that the village was located near the study area, however the lack of detail and agreement on its location make it difficult to place.

Review of historical maps found two buildings within the study area in 1954 and a third L-shaped building in 1968 (Dodge 1892; General Land Office 1862; USACE 1942; USGS 1914, 1954a, 1954b; Whitney 1873).

Field Survey Procedures

Virginia Ton completed a field survey on April 21, 2014. Most of the study area is paved; all visible soil was inspected. Visibility was very poor with asphalt, fill, and vegetation being the chief hindrances.

Based on the distribution of known cultural resources and their environmental settings, it was anticipated that prehistoric archaeological sites could be found within the study area. Prehistoric archaeological site indicators expected to be found in the region include but are not limited to: obsidian and chert flakes and chipped stone tools; grinding and mashing implements such as slabs and handstones, and mortars and pestles; bedrock outcrops and boulders with mortar cups; and locally darkened midden soils containing some of the previously listed items plus fragments of bone, shellfish, and fire affected stones. Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps).

Field Survey Findings

Archaeology
No prehistoric or historical archaeological sites were found within the study area.

Built Environment
There is a defunct gas station/garage L-shaped building within the study area, which appears to be depicted on maps beginning in 1968.

RECOMMENDATIONS

Known Resources

Archaeology
No prehistoric or historical archaeological sites were found within the study area, and no resource-specific recommendations are made.

Built Environment
The one building within the study area is not architecturally distinctive, and is unlikely to meet criteria for inclusion in the California Register of Historical Resources. No resource-specific recommendations are made.

Accidental Discovery

There is the slight possibility that buried archaeological deposits could be present, and accidental discovery could occur. In keeping with the CEQA guidelines, if archaeological remains are uncovered, work at the place of discovery should be halted immediately until a qualified archaeologist can evaluate the finds (§15064.5 [f]). Prehistoric archaeological site indicators include: obsidian and chert flakes and chipped stone tools; grinding and mashing implements (e.g., slabs and handstones, and mortars and pestles); bedrock outcrops and boulders with mortar cups; and locally darkened midden soils. Midden soils may contain a combination of any of the previously listed items with the possible addition of bone and shell remains, and fire affected stones. Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps).

The following actions are promulgated in Public Resources Code 5097.98 and Health and Human Safety Code 7050.5, and pertain to the discovery of human remains. If human remains are encountered, excavation or disturbance of the location must be halted in the vicinity of the find, and the county coroner contacted. If the coroner determines the remains are Native American, the coroner will contact the Native American Heritage Commission. The Native American Heritage Commission will identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent makes recommendations regarding the treatment of the remains with appropriate dignity.

SUMMARY

Tom Origer & Associates conducted a cultural resources of approximately 2.7 acres for the Novato Main Gate project near Hamilton Field in Novato, as requested by Jean Eisberg of Urban Planning Partners. Survey found no prehistoric or historical resources within the study area and no resources-specific recommendations were warranted.

MATERIALS CONSULTED

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APPENDIX A: Native American Contact

Contact Log
Correspondence and Maps

Native American Contact Efforts
Novato Main Gate Project, Marin County

Organization	Contact	Letters	Results
Native American Heritage Commission		4/10/2014	No response received as of the date of this report.
Federated Indians of Graton Rancheria	Greg Sarris Gene Buvelot	4/10/2014	No response received as of the date of this report.

APPENDIX E

Noise Monitoring Report

Appendix 3

Figure 1 Noise Monitoring Locations

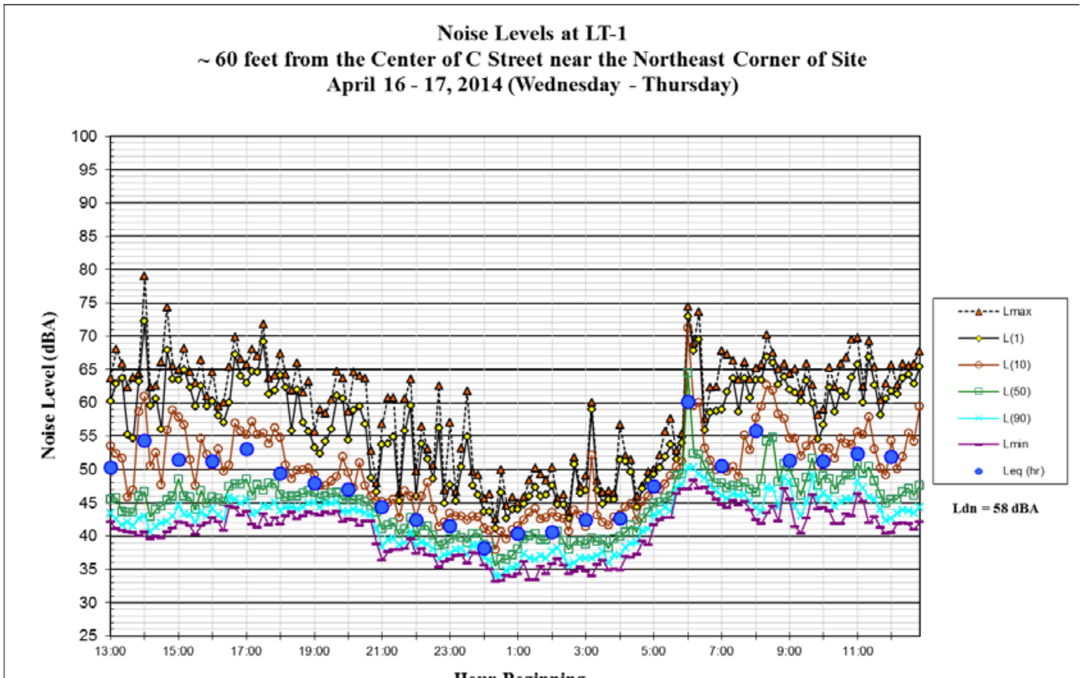


Figure 2

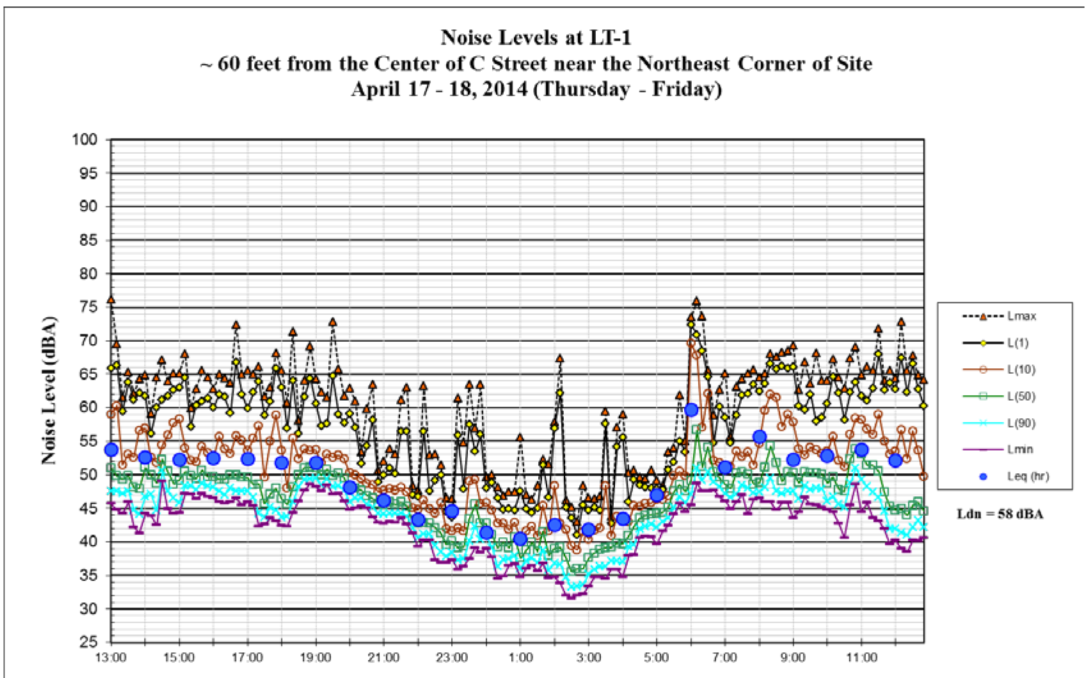


Figure 3

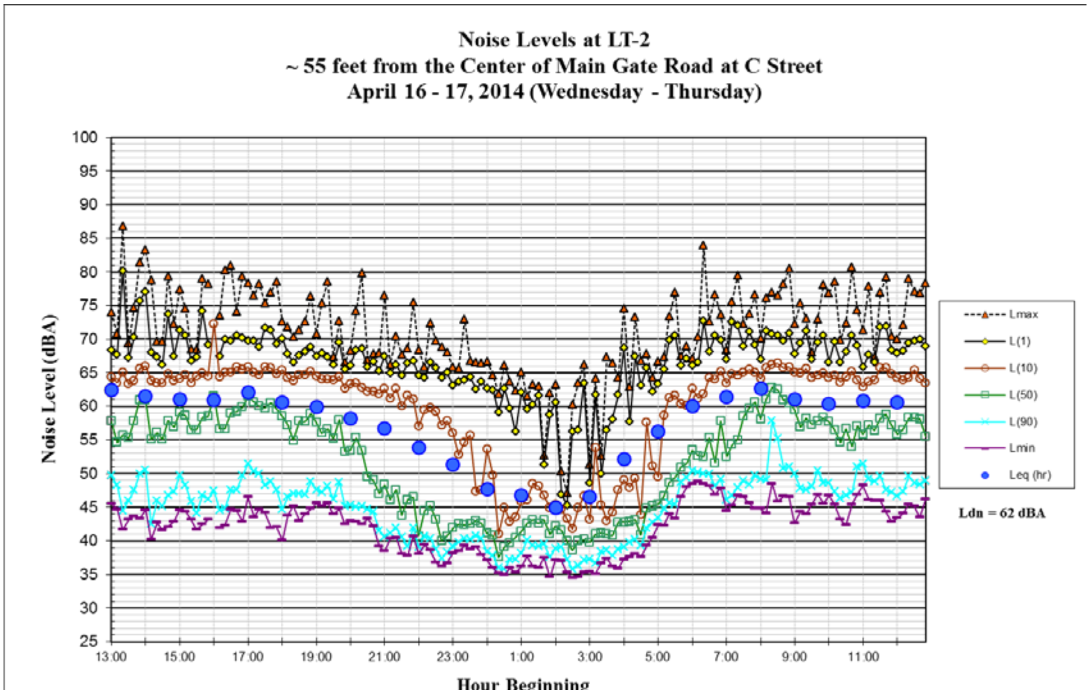


Figure 4

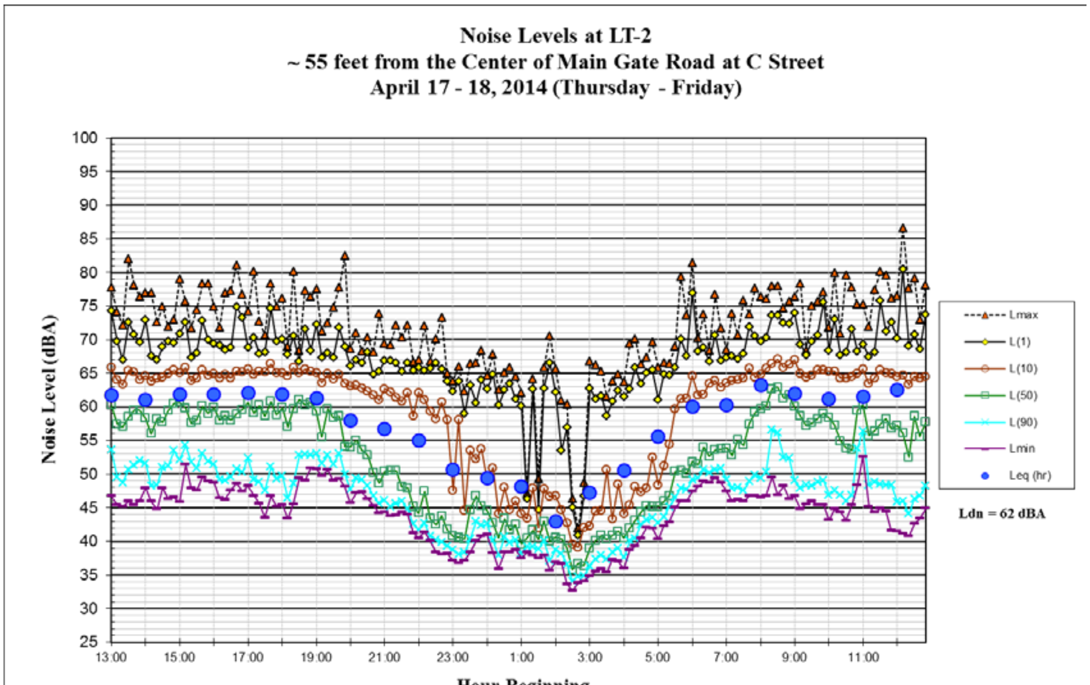


Figure 5

APPENDIX F

2007 Final Traffic Impact Analysis

Kimley-Horn
and Associates, Inc.

Memorandum

2000 Crow Canyon Place
Suite 410
San Ramon, California
94583

To: Michael J. Marovich
West Bay Builders

From: Jim Daisa, P.E.
Kimley-Horn and Associates, Inc.

Date: June 11, 2007

Subject: Final Traffic Impact Analysis for the development of a Professional Business Office Campus called the Hamilton Main Gate Plaza in Hamilton Field Novato, CA

This memorandum presents our preliminary traffic analysis for the proposed project consisting of a 30,550 square foot professional office condominium development as part of the Main Gate Plaza Development in Novato, CA. The intent of this analysis is to examine the traffic generation and potential intersection level of service impacts resulting from the proposed development. The analysis assesses traffic impacts for two scenarios: Existing and Existing Plus Project conditions. The background, methodology, and conclusions are described below.

A. Project Description

The intent of the Main Gate Plaza Development is to convert this brownfield, infill site into a business office campus that can provide services to the Hamilton community and surrounding areas as well as offer an opportunity for neighboring residents to locate their businesses in a place that is proximate to their homes. It also provides the smaller business operator an ownership opportunity to buy an individual office unit that affords the ability to build equity over time and the tax advantages of property ownership. The proposed development consists of five buildings totaling approximately 30,550 square feet with 111 parking spaces. The buildings are designed for maximum flexibility. It is located in the southeastern portion of city of Novato, California.

B. Land Use Consistency

The proposed project is located in Planning Area 5 of the reuse plan (The Exchange Triangle area) with a Neighborhood Commercial zoning designation. This designation allows for convenience goods and services including small professional offices. Therefore the proposed project is consistent with the designation and intent of the Reuse Plan and zoning code.

TEL 925 543 0840
FAX 925 543 0839

C. Study Area

The traffic analysis study intersections are:

- Nave Drive / State Access Road
- Nave Drive / Main Gate Road (signalized)
- C Street / Main Gate Road

D. Analysis Methodology

The traffic analysis includes AM and PM peak hour level of service (LOS) at the one signalized and both unsignalized intersections. Intersection LOS is based on the 2000 Highway Capacity Manual (HCM) operations methodology which measures level of service in terms of average vehicle delay. Existing conditions is based on current traffic control, lane configurations and traffic volumes. Traffic generated by the project is estimated and added to existing traffic volumes to measure existing plus project conditions.

E. Existing Traffic Volumes

Existing traffic counts for the intersections of Nave Drive / Main Gate Road and C Street / Main Gate Road were collected on April 18, 2007. Existing traffic counts for the Nave Drive / State Access Road intersection were obtained from the Revised Traffic Analysis for Hamilton Market Place – Novato Report produced by Dowling Associates, Inc (March 5, 2007). The traffic counts can be found in the appendix.

F. Trip Generation

The Institute of Transportation Engineer's (ITE) Trip Generation, 7th Edition, was used to obtain daily and peak-hour trip generation rates and inbound-outbound percentages. This information was used to estimate the number of daily and peak hour trips that can be attributed to the proposed development. The trip generation of the proposed office building are summarized in **Table 1**.

Table 1: Estimated Project Trip Generation

Land Use	ITE Code	Size	Units	Daily	AM Peak			PM Peak		
				Total	In	Out	Total	In	Out	Total
General Office	710	30,550	SF	535	64	9	73	19	94	113

Trip generation equations (source: ITE Trip Generation, 7th Edition)

Daily	Ln(T) = 0.77 x Ln(1000's of SF) + 3.65	50%	In	50%	Out
AM Peak Hour	Ln(T) = 0.80 x Ln(1000's of SF) + 1.55	88%	In	12%	Out
PM Peak Hour	T = 1.12 x (1000's of SF) + 78.81	17%	In	83%	Out

The Neighborhood Commercial designation allows for a greater amount of retail commercial than office commercial. For comparison, this analysis estimates the traffic generation of the site if it were developed as retail. It is assumed that a retail use on this 2.7 acre site would have a floor area ratio (FAR) of 0.35 (the Reuse Plan allows an FAR up to 0.50). This would equal about 41,200 square feet of retail. Using the trip generation rates for Neighborhood Commercial in the Reuse Plan traffic analysis this amount of retail would generate about 79 a.m. peak hour trips and about 218 p.m. peak hour trips. The proposed office use at this site would generate about the same amount of morning traffic and almost less than half the amount of afternoon traffic that a retail use would generate. Therefore, the office use as proposed results in less impact than if the site were developed as retail.

G. Trip Distribution

Trip distribution is the direction project generated traffic travels when entering and leaving the site. Existing traffic counts were used to estimate the direction of travel and project traffic was assigned to the study intersection based on these patterns. The distribution pattern is summarized below:

- Nave Drive (south): 60%
- Nave Drive (north): 40%

The proposed project is located at the intersection of Main Gate Road and C Street, so users of the site can use either street to access the building. For this analysis it was assumed that 75% of the traffic accesses the site from Main Gate Road and 25% from C Street.

H. Existing and Existing Plus Project Level of Service

Table 2 compares existing and existing plus project intersection level of service at the three study intersections. Currently, the three study intersections operate at LOS C or better in the AM and PM peak hours. With the addition of project traffic the change in average delay or volume to capacity ratio is negligible and does not change the intersection level of service.

Table 2: Existing and Plus Project Conditions Level of Service Results

Intersection	Existing Conditions						Existing Plus Project Conditions					
	AM			PM			AM			PM		
	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS
Nave Drive / State Access Road	-	10.7	B	-	9.7	A	-	10.7	B	-	9.8	A
Nave Drive / Main Gate Road (signalized)	0.42	20.4	C	0.33	22.7	C	0.43	21.1	C	0.36	23.9	C
C Street / Main Gate Road	-	13.6	B	-	12.8	B	-	14.4	B	-	11.4	B

Notes:

V/C = the ratio of critical traffic volumes to intersection capacity, a measure of the utilization of signalized intersections.

Delay for unsiganlized intersections is based on the delay for the worst-case approach for the intersection.

Source: Kimley-Horn and Associates, Inc.

I. Planned Improvements and Impact Fees

The proposed project is subject to the City's Traffic Impact Fee (TIF) which funds planned improvements citywide. In the vicinity of the project, the TIF is designated to fund a new traffic signal at the intersection of Alameda Del Prado and the US 101 Southbound Ramps.

J. Comparison of Level of Service With Hamilton Reuse Plan

Table 3 compares existing plus project intersection levels of service to those presented in the Reuse Plan for the Hamilton Army Airfield (Technical Appendix) for the two intersections in common. Note that the internal street (Main Gate Road/C Street) was not evaluated in the Reuse Plan. Also note the Reuse Plan evaluated the intersection of Nave Drive/State Access Road as a signalized intersection where it is currently stop controlled. As shown in the comparison, the existing and existing plus project conditions are similar to the Preferred General Plan and the Preferred Reuse Plan intersection levels of service.

K. Adequacy of Proposed Parking Supply

The project proposes to provide 111 parking spaces based on a ratio of one space for every 275 of gross floor area (30,550 gross square feet / 275 = 111 spaces). The proposed parking spaces conforms to the City's zoning code (Section 19.30.040 Number of Parking Spaces Required, Table 3.7) which requires one space per 275 gross square feet of office use.

L. Site Access and Circulation

The proposed site is accessed by two driveways. One driveway is located on Main Gate Road approximately 362 feet west of the intersection of C Street. Main Gate Road at this location is a divided road with a raised landscaped median restricting this driveway to right-in/right-out. An eastbound left turn bay provides space for vehicles turning onto C Street. The second driveway is located on C Street approximately 370 feet north of the intersection of Main Gate Road. This driveway permits full access. Vehicles entering the site from Nave Drive will use the C Street entrance while vehicles existing the site in any direction may use either driveway.

The site's parking lot is located to the side and rear of the buildings and is oriented in a standard orthogonal layout. The parking spaces are designed to industry standards, oriented at 90 degrees with an aisle width of about 27 feet. Refuse is collected at two kiosks/enclosures within the parking lot. A 13 x 54 foot long curbside loading area is provided along the north side of Building A, conforming to the City's zoning code (Section 19.30.110 Loading Space Requirements).

Pedestrians can access the site via sidewalks on both sides of Main Gate Road. These sidewalks are continuous onto Nave Drive where a signalized intersection allows controlled pedestrian crossing of Nave Drive and Main Gate Road. C Street currently lacks sidewalks or provides sidewalks in poor condition. The project proposes to construct new sidewalks along its frontage on Main Gate Road and C Street. In addition the project provides an on-site pedestrian path system connecting public sidewalks and parking areas to each building. The site is served by transit (Golden

Gate Transit) with the nearest bus stop located on Main Gate Road several hundred feet west of the site. Another bus stop exists on Nave Drive immediately south of the intersection of Main Gate Road. In addition to pedestrian access, the project is accessible by bicycle. Class II bike lanes exist on Nave Drive but are not continuous to the north. The General Plan identifies Class II bike lanes for the entire length of nave Drive. The bicycle facilities on Nave Drive connect to a designated bike route on the sidewalk on the south side of Main Gate Road.

APPENDICES

1. Turning Movement Counts
2. Level of service calculation worksheets

Table 3: Level of Service Comparison With Hamilton Airfield Reuse Plan

Intersections	Existing Conditions			Existing Plus Project			Prefered General Plan			Alternative A			Alternative B			Alternative C			Preferred Reuse Plan		
	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS
AM Peak Hour																					
State Access Road / Nave Drive	-	10.7	B	-	10.7	B	0.43	3.2	A	0.48	4.8	A	0.54	5.8	B	0.48	4.8	A	0.43	2	A
Main Gate Road / Nave Drive	0.42	20.4	C	0.43	21.1	C	0.78	19.8	C	0.88	24.9	C	0.97	35.4	D	0.85	23	C	0.82	21.3	C
PM Peak Hour																					
State Access Road / Nave Drive	-	9.7	A	-	9.8	A	0.46	10.2	B	0.71	7	B	0.79	10.6	B	0.67	6.7	B	0.51	2.4	A
Main Gate Road / Nave Drive	0.33	22.7	C	0.36	23.9	C	0.83	19.2	C	0.76	16.5	C	0.81	19.4	C	0.7	14.7	B	0.58	11.9	B

Notes:
V/C = the ratio of critical traffic volumes to intersection capacity, a measure of the utilization of signalized intersections.
Delay for unsiganlized intersections is based on the delay for the worst-case approach for the intersection.
Source: Reuse Plan for the Hamilton Army Airfield Technical Plan (Fehrand Peers Associates, Inc.) and Kimley-Horn and Associates, Inc.

Appendix

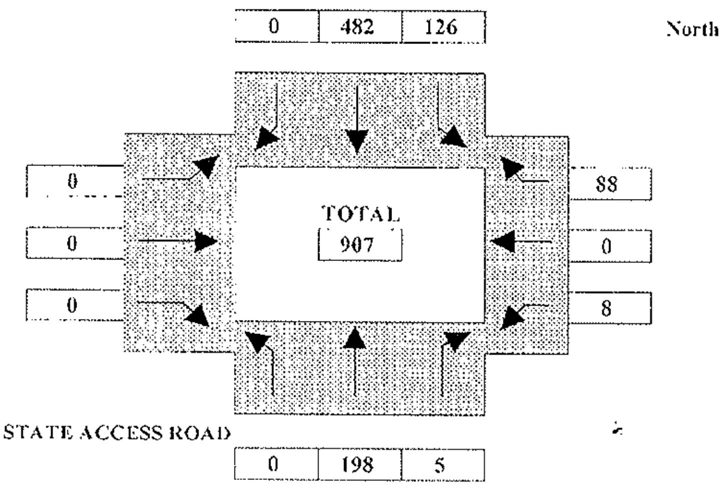
BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

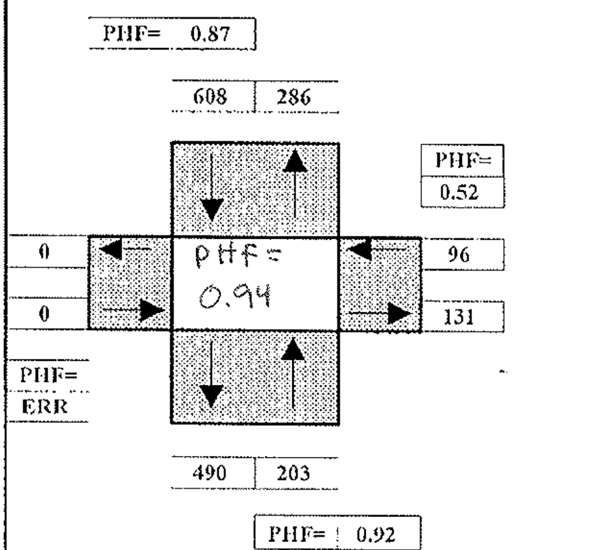
PROJECT: NOVATO TMC	SURVEY DATE: 4 / 18 / 2007		DAY: WEDNESDAY
N-S Approach: NAVE	SURVEY TIME: 7:00 AM	TO	9:00 AM
E-W Approach: STATE ACCESS ROAD	CITY: NOVATO		FILE: SANANVAM

PEAK HOUR

07:45 AM TO 08:45 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
07:00 AM	---	07:15 AM	0	36	0	8	86	0	0	0	0	1	0	4	*135*
07:15 AM	---	07:30 AM	0	54	0	22	190	0	0	0	0	1	0	10	*277*
07:30 AM	---	07:45 AM	0	104	2	36	298	0	0	0	0	3	0	22	*465*
07:45 AM	---	08:00 AM	0	156	2	50	413	0	0	0	0	5	0	36	*662*
08:00 AM	---	08:15 AM	0	211	2	79	558	0	0	0	0	5	0	48	*903*
08:15 AM	---	08:30 AM	0	255	5	131	679	0	0	0	0	5	0	70	*1,145*
08:30 AM	---	08:45 AM	0	302	7	162	780	0	0	0	0	11	0	110	*1,372*
08:45 AM	---	09:00 AM	0	344	7	180	873	0	0	0	0	11	0	133	*1,548*
TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	0	36	0	8	86	0	0	0	0	1	0	4	*135*
07:15 AM	---	07:30 AM	0	18	0	14	104	0	0	0	0	0	0	6	*142*
07:30 AM	---	07:45 AM	0	50	2	14	108	0	0	0	0	2	0	12	*188*
07:45 AM	---	08:00 AM	0	52	0	14	115	0	0	0	0	2	0	14	*197*
08:00 AM	---	08:15 AM	0	55	0	29	145	0	0	0	0	0	0	12	*241*
08:15 AM	---	08:30 AM	0	44	3	52	121	0	0	0	0	0	0	22	*242*
08:30 AM	---	08:45 AM	0	47	2	31	101	0	0	0	0	6	0	40	*227*
08:45 AM	---	09:00 AM	0	42	0	18	93	0	0	0	0	0	0	23	*176*
HOURLY TOTALS															
07:00 AM	---	08:00 AM	0	156	2	50	413	0	0	0	0	5	0	36	*662*
07:15 AM	---	08:15 AM	0	175	2	71	472	0	0	0	0	4	0	44	*768*
07:30 AM	---	08:30 AM	0	201	5	109	489	0	0	0	0	4	0	60	*868*
07:45 AM	---	08:45 AM	0	198	5	126	482	0	0	0	0	8	0	88	*907*
08:00 AM	---	09:00 AM	0	188	5	130	460	0	0	0	0	6	0	97	*886*

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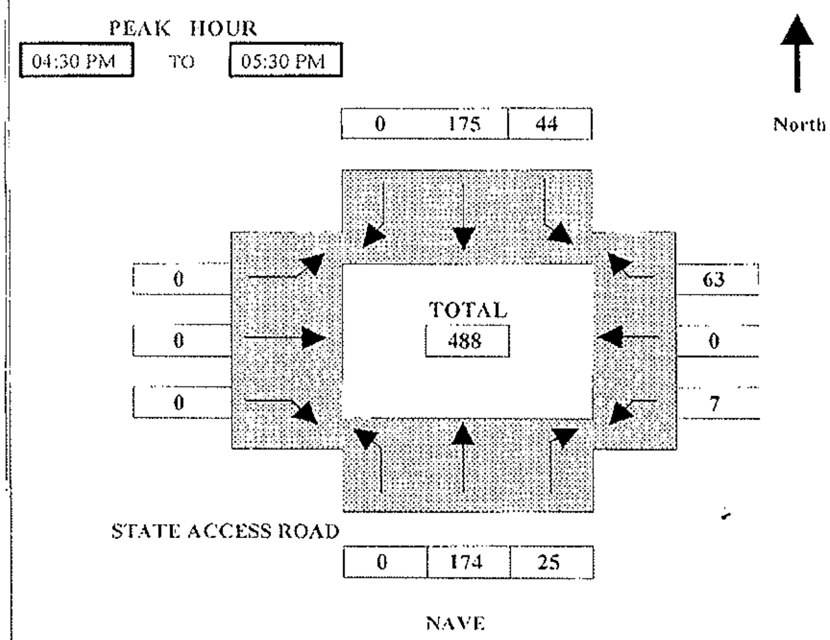
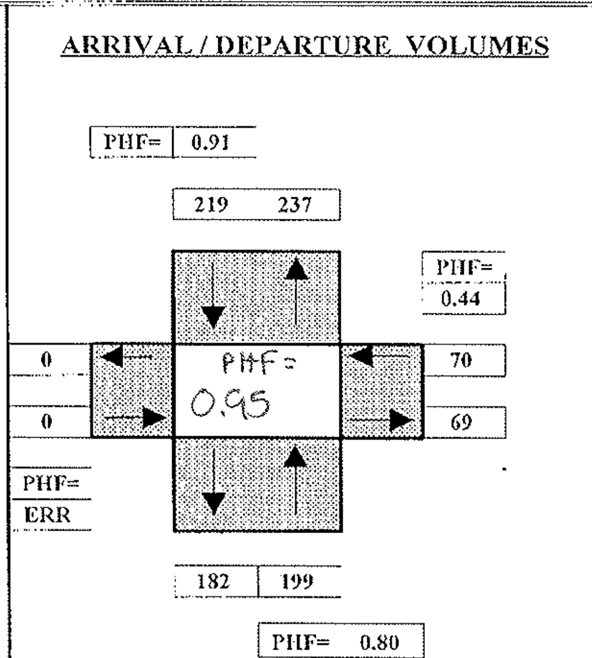
BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: NOVATO TMC	SURVEY DATE: 4 / 18 / 2007		DAY: WEDNESDAY
N-S Approach: NAVE	SURVEY TIME: 4:00 PM	TO 6:00 PM	
E-W Approach: STATE ACCESS ROAD	CITY: NOVATO		FILE: SANANVPM





TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
							SURVEY DATA								
04:00 PM	---	04:15 PM	0	52	3	5	38	0	0	0	0	2	0	15	*115*
04:15 PM	---	04:30 PM	0	94	7	13	80	0	0	0	0	3	0	27	*224*
04:30 PM	---	04:45 PM	0	140	12	20	130	0	0	0	0	3	0	47	*352*
04:45 PM	---	05:00 PM	0	181	16	35	171	0	0	0	0	4	0	63	*470*
05:00 PM	---	05:15 PM	0	216	22	49	217	0	0	0	0	9	0	78	*591*
05:15 PM	---	05:30 PM	0	268	32	57	255	0	0	0	0	10	0	90	*712*
05:30 PM	---	05:45 PM	0	314	41	64	300	0	0	0	0	12	0	101	*832*
05:45 PM	---	06:00 PM	0	359	47	72	348	0	0	0	0	14	0	116	*956*
							TOTAL BY PERIOD								
04:00 PM	---	04:15 PM	0	52	3	5	38	0	0	0	0	2	0	15	*115*
04:15 PM	---	04:30 PM	0	42	4	8	42	0	0	0	0	1	0	12	*109*
04:30 PM	---	04:45 PM	0	46	5	7	50	0	0	0	0	0	0	20	*128*
04:45 PM	---	05:00 PM	0	41	4	15	41	0	0	0	0	1	0	16	*118*
05:00 PM	---	05:15 PM	0	35	6	14	46	0	0	0	0	5	0	15	*121*
05:15 PM	---	05:30 PM	0	52	10	8	38	0	0	0	0	1	0	12	*121*
05:30 PM	---	05:45 PM	0	46	9	7	45	0	0	0	0	2	0	11	*120*
05:45 PM	---	06:00 PM	0	45	6	8	48	0	0	0	0	2	0	15	*124*
							HOURLY TOTALS								
04:00 PM	---	05:00 PM	0	181	16	35	171	0	0	0	0	4	0	63	*470*
04:15 PM	---	05:15 PM	0	164	19	44	179	0	0	0	0	7	0	63	*476*
04:30 PM	---	05:30 PM	0	174	25	44	175	0	0	0	0	7	0	63	*488*
04:45 PM	---	05:45 PM	0	174	29	44	170	0	0	0	0	9	0	54	*480*
05:00 PM	---	06:00 PM	0	178	31	37	177	0	0	0	0	10	0	53	*486*

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BAYMETRICS TRAFFIC RESOURCES

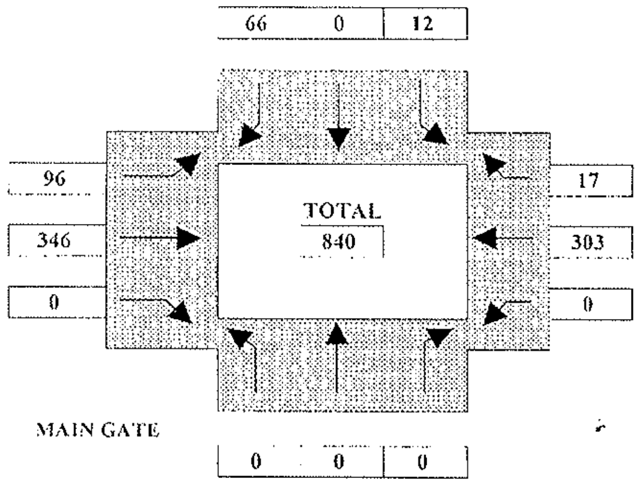
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: NOVATO TMC	SURVEY DATE: 4 / 18 / 2007		DAY: WEDNESDAY
N-S Approach: C STREET	SURVEY TIME: 7:00 AM	TO	9:00 AM
E-W Approach: MAIN GATE	CITY: NOVATO		FILE: MG0CNVAM

PEAK HOUR

08:00 AM TO 09:00 AM

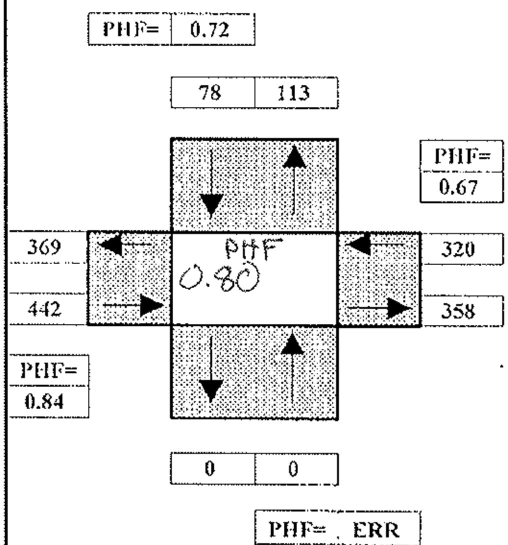
North



MAIN GATE

C STREET

ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
SURVEY DATA															
07:00 AM	---	07:15 AM	0	0	0	2	0	4	4	24	0	0	83	1	*118*
07:15 AM	---	07:30 AM	0	0	0	3	0	8	6	55	0	0	141	5	*218*
07:30 AM	---	07:45 AM	0	0	0	4	0	11	14	93	0	0	210	11	*343*
07:45 AM	---	08:00 AM	0	0	0	6	0	19	18	148	0	0	268	16	*475*
08:00 AM	---	08:15 AM	0	0	0	6	0	32	35	197	0	0	337	18	*625*
08:15 AM	---	08:30 AM	0	0	0	7	0	43	68	296	0	0	448	26	*888*
08:30 AM	---	08:45 AM	0	0	0	13	0	64	99	392	0	0	511	31	*1,110*
08:45 AM	---	09:00 AM	0	0	0	18	0	85	114	494	0	0	571	33	*1,315*
TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	0	0	0	2	0	4	4	24	0	0	83	1	*118*
07:15 AM	---	07:30 AM	0	0	0	1	0	4	2	31	0	0	58	4	*100*
07:30 AM	---	07:45 AM	0	0	0	1	0	3	8	38	0	0	69	6	*125*
07:45 AM	---	08:00 AM	0	0	0	2	0	8	4	55	0	0	58	5	*132*
08:00 AM	---	08:15 AM	0	0	0	0	0	13	17	49	0	0	69	2	*150*
08:15 AM	---	08:30 AM	0	0	0	1	0	11	33	99	0	0	111	8	*263*
08:30 AM	---	08:45 AM	0	0	0	6	0	21	31	96	0	0	63	5	*222*
08:45 AM	---	09:00 AM	0	0	0	5	0	21	15	102	0	0	60	2	*205*
HOURLY TOTALS															
07:00 AM	---	08:00 AM	0	0	0	6	0	19	18	148	0	0	268	16	*475*
07:15 AM	---	08:15 AM	0	0	0	4	0	28	31	173	0	0	254	17	*507*
07:30 AM	---	08:30 AM	0	0	0	4	0	35	62	241	0	0	307	21	*670*
07:45 AM	---	08:45 AM	0	0	0	9	0	53	85	299	0	0	301	20	*767*
08:00 AM	---	09:00 AM	0	0	0	12	0	66	96	346	0	0	303	17	*840*

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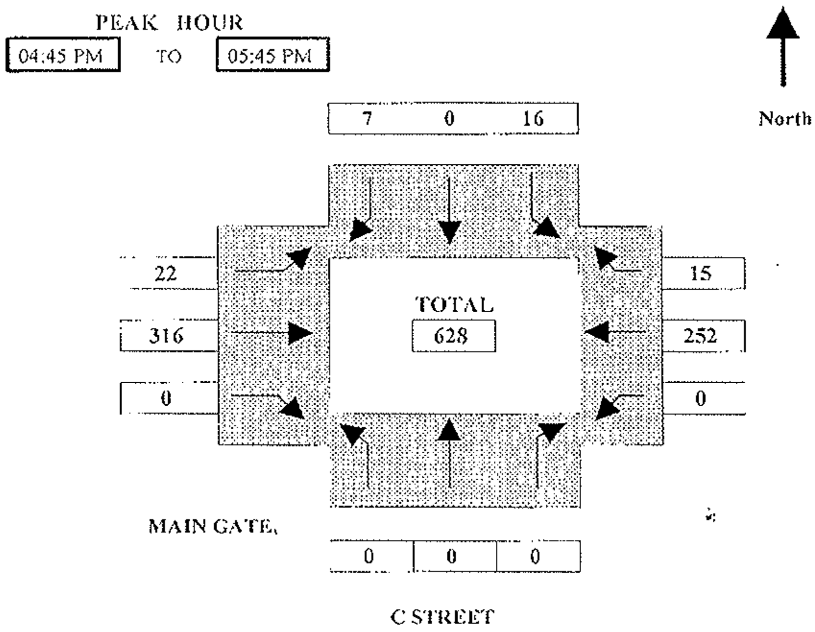
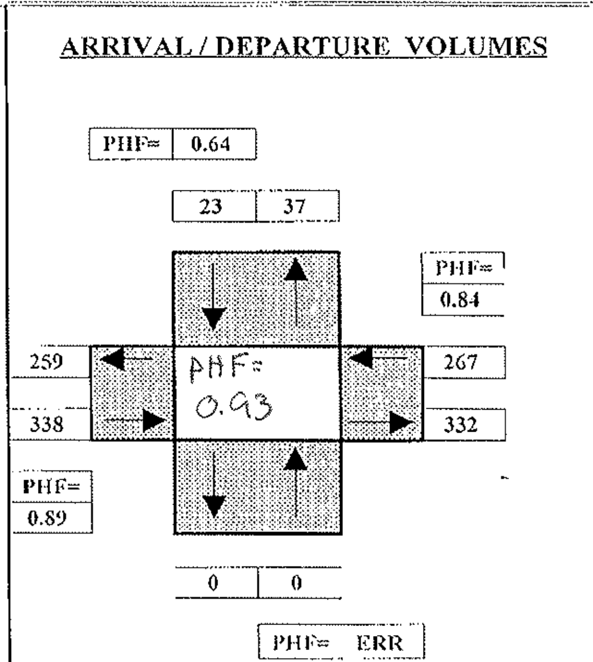
BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: NOVATO TMC	SURVEY DATE: 4/18/2007		DAY: WEDNESDAY
N-S Approach: C STREET	SURVEY TIME: 4:00 PM	TO	6:00 PM
E-W Approach: MAIN GATE	CITY: NOVATO		FILE: MG0CNVPM





TIME PERIOD From		To	NORTHBOUND Left	NORTHBOUND Thru	NORTHBOUND Right	SOUTHBOUND Left	SOUTHBOUND Thru	SOUTHBOUND Right	EASTBOUND Left	EASTBOUND Thru	EASTBOUND Right	WESTBOUND Left	WESTBOUND Thru	WESTBOUND Right	TOTAL
SURVEY DATA															
04:00 PM	---	04:15 PM	0	0	0	3	0	0	5	52	0	0	46	5	*111*
04:15 PM	---	04:30 PM	0	0	0	10	0	2	12	115	0	0	98	9	*246*
04:30 PM	---	04:45 PM	0	0	0	14	0	3	15	186	0	0	161	12	*391*
04:45 PM	---	05:00 PM	0	0	0	16	0	3	20	266	0	0	212	18	*535*
05:00 PM	---	05:15 PM	0	0	0	22	0	5	27	354	0	0	274	22	*704*
05:15 PM	---	05:30 PM	0	0	0	27	0	8	31	426	0	0	350	25	*867*
05:30 PM	---	05:45 PM	0	0	0	30	0	10	37	502	0	0	413	27	*1,019*
05:45 PM	---	06:00 PM	0	0	0	34	0	10	40	565	0	0	473	29	*1,151*
TOTAL BY PERIOD															
04:00 PM	---	04:15 PM	0	0	0	3	0	0	5	52	0	0	46	5	*111*
04:15 PM	---	04:30 PM	0	0	0	7	0	2	7	63	0	0	52	4	*135*
04:30 PM	---	04:45 PM	0	0	0	4	0	1	3	71	0	0	63	3	*145*
04:45 PM	---	05:00 PM	0	0	0	2	0	0	5	80	0	0	51	6	*144*
05:00 PM	---	05:15 PM	0	0	0	6	0	2	7	88	0	0	62	4	*169*
05:15 PM	---	05:30 PM	0	0	0	5	0	3	4	72	0	0	76	3	*163*
05:30 PM	---	05:45 PM	0	0	0	3	0	2	6	76	0	0	63	2	*152*
05:45 PM	---	06:00 PM	0	0	0	4	0	0	3	63	0	0	60	2	*132*
HOURLY TOTALS															
04:00 PM	---	05:00 PM	0	0	0	16	0	3	20	266	0	0	212	18	*535*
04:15 PM	---	05:15 PM	0	0	0	19	0	5	22	302	0	0	228	17	*593*
04:30 PM	---	05:30 PM	0	0	0	17	0	6	19	311	0	0	252	16	*621*
04:45 PM	---	05:45 PM	0	0	0	16	0	7	22	316	0	0	252	15	*628*
05:00 PM	---	06:00 PM	0	0	0	18	0	7	20	299	0	0	261	11	*616*

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Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Nave Drive / State Access Road	B	10.7	0.000	B	10.7	0.000	+ 0.000 D/V
# 2 Nave Drive / Main Gate Road	C	20.4	0.423	C	20.4	0.423	+ 0.000 D/V
# 3 C Street / Main Gate Road	B	13.6	0.000	B	13.6	0.000	+ 0.000 D/V

```
-----------------------------------------------------------------------------
-----------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
*****************************************************************************
Intersection #1 Nave Drive / State Access Road
*****************************************************************************
Average Delay (sec/veh):       2.2       Worst Case Level Of Service: B[ 10.7]
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  0  1    1  0  1  0  0    0  0  0  0  0    1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  198     5   126  482     0     0    0     0     8    0    88
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  198     5   126  482     0     0    0     0     8    0    88
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:     0  211     5   134  513     0     0    0     0     9    0    94
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  211     5   134  513     0     0    0     0     9    0    94
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   216 xxxx xxxxx  xxxx xxxx xxxxx   991 xxxx   211
Potent Cap.: xxxx xxxx xxxxx  1366 xxxx xxxxx  xxxx xxxx xxxxx   275 xxxx   835
Move Cap.:   xxxx xxxx xxxxx  1366 xxxx xxxxx  xxxx xxxx xxxxx   254 xxxx   835
Volume/Cap:  xxxx xxxx  xxxx  0.10 xxxx  xxxx  xxxx xxxx  xxxx  0.03 xxxx  0.11
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.3 xxxx xxxxx  xxxx xxxx xxxxx   0.1 xxxx   0.4
Control Del:xxxxx xxxx xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx  19.6 xxxx   9.9
LOS by Move:    *    *     *     A    *     *     *    *     *     C    *     A
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            10.7
ApproachLOS:        *                *                *                B
*****************************************************************************
Note: Queue reported is the number of cars per lane.
*****************************************************************************
```

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #2 Nave Drive / Main Gate Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.423
Loss Time (sec):	6 (Y+R=4.0 sec)	Average Delay (sec/veh):	20.4
Optimal Cycle:	24	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Split Phase			Split Phase	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1 0 1			1 0 1 0 0			0 0 0 0 0			1 0 0 0 1		
Volume Module:												
Base Vol:	0	104	189	183	464	0	0	0	0	219	0	94
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	104	189	183	464	0	0	0	0	219	0	94
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	0	113	205	199	504	0	0	0	0	238	0	102
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	113	205	199	504	0	0	0	0	238	0	102
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	113	205	199	504	0	0	0	0	238	0	102
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.85	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	1900	1615	1805	1900	0	0	0	0	1805	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.06	0.13	0.11	0.27	0.00	0.00	0.00	0.00	0.13	0.00	0.06
Crit Moves:	****				****					****		
Green/Cycle:	0.00	0.34	0.34	0.29	0.63	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Volume/Cap:	0.00	0.18	0.38	0.38	0.42	0.00	0.00	0.00	0.00	0.42	0.00	0.20
Uniform Del:	0.0	23.4	25.2	28.2	9.4	0.0	0.0	0.0	0.0	27.3	0.0	25.3
IncremntDel:	0.0	0.1	0.4	0.5	0.2	0.0	0.0	0.0	0.0	0.5	0.0	0.2
InitQueuDel:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Delay/Veh:	0.0	23.5	25.7	28.7	9.7	0.0	0.0	0.0	0.0	27.8	0.0	25.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	23.5	25.7	28.7	9.7	0.0	0.0	0.0	0.0	27.8	0.0	25.5
LOS by Move:	A	C	C	C	A	A	A	A	A	C	A	C
HCM2kAvgQ:	0	2	5	5	8	0	0	0	0	6	0	2

Note: Queue reported is the number of cars per lane.

```
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #3 C Street / Main Gate Road
*******************************************************************************
Average Delay (sec/veh):      2.2       Worst Case Level Of Service: B[ 13.6]
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0   0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0    0     0   12    0    66    96  346     0     0  303    17
Growth Adj:   1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0   12    0    66    96  346     0     0  303    17
User Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.80 0.80  0.80 0.80 0.80  0.80  0.80 0.80  0.80  0.80 0.80  0.80
PHF Volume:      0    0     0   15    0    83   120  433     0     0  379    21
Reduct Vol:      0    0     0    0    0     0     0    0     0     0    0     0
FinalVolume:     0    0     0   15    0    83   120  433     0     0  379    21
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4  6.5   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5  4.0   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1062 1062   389   400 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   250  225   663  1170 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   230  202   663  1170 xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.07 0.00  0.12  0.10 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   0.3 xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.4 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *    *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  514 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx  0.7 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx 13.6 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:      *    *     *    *    B     *     *    *     *     *    *     *
ApproachDel:      xxxxxx             13.6             xxxxxx           xxxxxx
ApproachLOS:         *                 B                *                *
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Nave Drive / State Access Road	A	9.7	0.000	A	9.7	0.000	+ 0.000 D/V
# 2 Nave Drive / Main Gate Road	C	22.7	0.355	C	22.7	0.355	+ 0.000 D/V
# 3 C Street / Main Gate Road	B	12.8	0.000	B	12.8	0.000	+ 0.000 D/V

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---------------------------------------------------------------------------
---------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
***************************************************************************
Intersection #1 Nave Drive / State Access Road
***************************************************************************
Average Delay (sec/veh):       2.1       Worst Case Level Of Service: A[  9.7]
***************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:       0  0  1  0  1   1  0  1  0  0   0  0  0  0  0   1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  174    25    44  175     0     0    0     0     7    0    63
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  174    25    44  175     0     0    0     0     7    0    63
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0  183    26    46  184     0     0    0     0     7    0    66
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  183    26    46  184     0     0    0     0     7    0    66
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   209 xxxx xxxxx  xxxx xxxx xxxxx   460 xxxx   183
Potent Cap.: xxxx xxxx xxxxx  1373 xxxx xxxxx  xxxx xxxx xxxxx   563 xxxx   864
Move Cap.:   xxxx xxxx xxxxx  1373 xxxx xxxxx  xxxx xxxx xxxxx   549 xxxx   864
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  xxxx  0.01 xxxx  0.08
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx   0.0 xxxx   0.2
Control Del:xxxxx xxxx xxxxx   7.7 xxxx xxxxx xxxxx xxxx xxxxx  11.7 xxxx   9.5
LOS by Move:    *    *     *     A    *     *     *    *     *     B    *     A
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx             9.7
ApproachLOS:        *                *                *                A
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
```

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---------------------------------------------------------------------------
---------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
***************************************************************************
Intersection #2 Nave Drive / Main Gate Road
***************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):        0.355
Loss Time (sec):        6 (Y+R=4.0 sec) Average Delay (sec/veh):       22.7
Optimal Cycle:         22               Level Of Service:                 C
***************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  0  1  0  1    1  0  1  0  0    0  0  0  0  0    1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  180  225   150  107    0     0    0    0   153    0  114
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   0  180  225   150  107    0     0    0    0   153    0  114
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92
PHF Volume:    0  196  245   163  116    0     0    0    0   166    0  124
Reduct Vol:    0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   0  196  245   163  116    0     0    0    0   166    0  124
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:   0  196  245   163  116    0     0    0    0   166    0  124
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  1.00 1.00 0.85  0.95 1.00 1.00  1.00 1.00 1.00  0.95 1.00 0.85
Lanes:       0.00 1.00 1.00  1.00 1.00 0.00  0.00 0.00 0.00  1.00 0.00 1.00
Final Sat.:     0 1900 1615  1805 1900    0     0    0    0  1805    0 1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.10 0.15  0.09 0.06 0.00  0.00 0.00 0.00  0.09 0.00 0.08
Crit Moves:            ****  ****                            ****
Green/Cycle: 0.00 0.43 0.43  0.25 0.68 0.00  0.00 0.00 0.00  0.26 0.00 0.26
Volume/Cap:  0.00 0.24 0.36  0.36 0.09 0.00  0.00 0.00 0.00  0.36 0.00 0.30
Uniform Del:  0.0 18.3 19.4  30.6  5.4  0.0   0.0  0.0  0.0  30.2  0.0 29.7
IncremntDel:  0.0  0.2  0.3   0.5  0.0  0.0   0.0  0.0  0.0   0.5  0.0  0.4
InitQueuDel:  0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0
Delay Adj:   0.00 1.00 1.00  1.00 1.00 0.00  0.00 0.00 0.00  1.00 0.00 1.00
Delay/Veh:    0.0 18.5 19.7  31.0  5.5  0.0   0.0  0.0  0.0  30.7  0.0 30.1
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   0.0 18.5 19.7  31.0  5.5  0.0   0.0  0.0  0.0  30.7  0.0 30.1
LOS by Move:    A    B    B     C    A    A     A    A    A     C    A    C
HCM2kAvgQ:      0    4    5     4    1    0     0    0    0     4    0    3
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
```

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                   Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #3 C Street / Main Gate Road
********************************************************************************
Average Delay (sec/veh):      0.7       Worst Case Level Of Service: B[ 12.8]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0    16    0     7    22  316     0     0  252    15
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    16    0     7    22  316     0     0  252    15
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:     0    0     0    17    0     8    24  340     0     0  271    16
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0    0     0    17    0     8    24  340     0     0  271    16
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4  6.5   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5  4.0   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   666  666   279   287 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   428  383   765  1287 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   422  376   765  1287 xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.04 0.00  0.01  0.02 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  488 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx  0.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx 12.8 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     *    *     *     *    *     *
ApproachDel:     xxxxxx             12.8            xxxxxx           xxxxxx
ApproachLOS:        *                B                 *                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Nave Drive / State Access Road	B	10.7	0.000	B	10.7	0.000	+ 0.000 D/V
# 2 Nave Drive / Main Gate Road	C	21.1	0.426	C	21.1	0.426	+ 0.000 D/V
# 3 C Street / Main Gate Road	B	14.4	0.000	B	14.4	0.000	+ 0.000 D/V

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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #1 Nave Drive / State Access Road
*******************************************************************************
Average Delay (sec/veh):      2.4       Worst Case Level Of Service: B[ 10.7]
*******************************************************************************
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled     Uncontrolled       Stop Sign         Stop Sign
Rights:            Include          Include          Include           Include
Lanes:        0  0  1  0  1    1  0  1  0  0    0  0  0  0  0    1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  198     5   142  482     0     0    0     0     8    0    90
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  198     5   142  482     0     0    0     0     8    0    90
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:     0  211     5   151  513     0     0    0     0     9    0    96
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  211     5   151  513     0     0    0     0     9    0    96
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   216 xxxx xxxxx  xxxx xxxx xxxxx  1026 xxxx   211
Potent Cap.: xxxx xxxx xxxxx  1366 xxxx xxxxx  xxxx xxxx xxxxx   262 xxxx   835
Move Cap.:   xxxx xxxx xxxxx  1366 xxxx xxxxx  xxxx xxxx xxxxx   240 xxxx   835
Volume/Cap:  xxxx xxxx  xxxx  0.11 xxxx  xxxx  xxxx xxxx  xxxx  0.04 xxxx  0.11
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.4 xxxx xxxxx  xxxx xxxx xxxxx   0.1 xxxx   0.4
Control Del:xxxxx xxxx xxxxx   8.0 xxxx xxxxx xxxxx xxxx xxxxx  20.5 xxxx   9.9
LOS by Move:    *    *     *     A    *     *     *    *     *     C    *     A
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx             10.7
ApproachLOS:        *                *                *                 B
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #2 Nave Drive / Main Gate Road
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.426
Loss Time (sec):        6 (Y+R=4.0 sec)  Average Delay (sec/veh):        21.1
Optimal Cycle:         24                Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected       Split Phase      Split Phase
Rights:         Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       0  0  1  0  1   1  0  1  0  0    0  0  0  0  0    1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  104   189   230  464     0     0     0     0   224     0    96
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  104   189   230  464     0     0     0     0   224     0    96
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    0  113   205   250  504     0     0     0     0   243     0   104
Reduct Vol:    0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:   0  113   205   250  504     0     0     0     0   243     0   104
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   0  113   205   250  504     0     0     0     0   243     0   104
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  0.85  0.95 1.00  1.00  1.00 1.00  1.00  0.95 1.00  0.85
Lanes:       0.00 1.00  1.00  1.00 1.00  0.00  0.00 0.00  0.00  1.00 0.00  1.00
Final Sat.:     0 1900  1615  1805 1900     0     0     0     0  1805     0  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.06  0.13  0.14 0.27  0.00  0.00 0.00  0.00  0.13 0.00  0.06
Crit Moves:             ****  ****                                ****
Green/Cycle: 0.00 0.30  0.30  0.32 0.62  0.00  0.00 0.00  0.00  0.32 0.00  0.32
Volume/Cap:  0.00 0.20  0.43  0.43 0.43  0.00  0.00 0.00  0.00  0.43 0.00  0.20
Uniform Del:  0.0 26.2  28.2  26.4  9.6   0.0   0.0  0.0   0.0  27.0  0.0  25.0
IncremntDel:  0.0  0.2   0.6   0.5  0.2   0.0   0.0  0.0   0.0   0.5  0.0   0.2
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 1.00  1.00  1.00 1.00  0.00  0.00 0.00  0.00  1.00 0.00  1.00
Delay/Veh:    0.0 26.3  28.8  26.9  9.9   0.0   0.0  0.0   0.0  27.5  0.0  25.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 26.3  28.8  26.9  9.9   0.0   0.0  0.0   0.0  27.5  0.0  25.2
LOS by Move:   A    C     C     C    A     A     A    A     A     C    A     C
HCM2kAvgQ:     0    3     5     6    8     0     0    0     0     6    0     2
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

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---------------------------------------------------------------------------
---------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
***************************************************************************
Intersection #3 C Street / Main Gate Road
***************************************************************************
Average Delay (sec/veh):       2.8       Worst Case Level Of Service: B[ 14.4]
***************************************************************************
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign        Stop Sign       Uncontrolled      Uncontrolled
Rights:            Include          Include          Include           Include
Lanes:         0  0  0  0  0   0  0  1! 0  0   1  0  1  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0     0     0    12     0    73   143   346     0     0   303    17
Growth Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:     0     0     0    12     0    73   143   346     0     0   303    17
User Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:      0.80  0.80  0.80  0.80  0.80  0.80  0.80  0.80  0.80  0.80  0.80  0.80
PHF Volume:      0     0     0    15     0    91   179   433     0     0   379    21
Reduct Vol:      0     0     0     0     0     0     0     0     0     0     0     0
FinalVolume:     0     0     0    15     0    91   179   433     0     0   379    21
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4  6.5   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5  4.0   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1179 1179   389   400 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   212  192   663  1170 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   187  163   663  1170 xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.08 0.00  0.14  0.15 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   0.5 xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.6 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:      LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  488 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx  0.8 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx 14.4 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     *    *     *     *    *     *
ApproachDel:      xxxxxx             14.4             xxxxxx            xxxxxx
ApproachLOS:         *                 B                 *                 *
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
```

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Nave Drive / State Access Road	A	9.8	0.000	A	9.8	0.000	+ 0.000 D/V
# 2 Nave Drive / Main Gate Road	C	23.9	0.390	C	23.9	0.390	+ 0.000 D/V
# 3 C Street / Main Gate Road	B	11.4	0.000	B	11.4	0.000	+ 0.000 D/V

```
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #1 Nave Drive / State Access Road
********************************************************************************
Average Delay (sec/veh):      2.5       Worst Case Level Of Service: A[  9.8]
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign         Stop Sign
Rights:           Include          Include           Include           Include
Lanes:        0  0  1  0  1    1  0  1  0  0    0  0  0  0  0    1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  174    25    49  175     0     0    0     0     7    0    86
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  174    25    49  175     0     0    0     0     7    0    86
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0  183    26    52  184     0     0    0     0     7    0    91
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  183    26    52  184     0     0    0     0     7    0    91
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   209 xxxx xxxxx  xxxx xxxx xxxxx   471 xxxx   183
Potent Cap.: xxxx xxxx xxxxx  1373 xxxx xxxxx  xxxx xxxx xxxxx   555 xxxx   864
Move Cap.:   xxxx xxxx xxxxx  1373 xxxx xxxxx  xxxx xxxx xxxxx   539 xxxx   864
Volume/Cap:  xxxx xxxx  xxxx  0.04 xxxx  xxxx  xxxx xxxx  xxxx  0.01 xxxx  0.10
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx   0.0 xxxx   0.3
Control Del:xxxxx xxxx xxxxx   7.7 xxxx xxxxx xxxxx xxxx xxxxx  11.8 xxxx   9.7
LOS by Move:    *    *     *     A    *     *     *    *     *     B    *     A
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx              9.8
ApproachLOS:        *                *                *                 A
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #2 Nave Drive / Main Gate Road
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.390
Loss Time (sec):       6 (Y+R=4.0 sec) Average Delay (sec/veh):       23.9
Optimal Cycle:        23               Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        0  0  1  0  1    1  0  1  0  0    0  0  0  0  0    1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  180   225   164  107     0     0    0     0   193    0   144
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  180   225   164  107     0     0    0     0   193    0   144
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:     0  196   245   178  116     0     0    0     0   210    0   157
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  196   245   178  116     0     0    0     0   210    0   157
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0  196   245   178  116     0     0    0     0   210    0   157
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  0.85  0.95 1.00  1.00  1.00 1.00  1.00  0.95 1.00  0.85
Lanes:       0.00 1.00  1.00  1.00 1.00  0.00  0.00 0.00  0.00  1.00 0.00  1.00
Final Sat.:     0 1900  1615  1805 1900     0     0    0     0  1805    0  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.10  0.15  0.10 0.06  0.00  0.00 0.00  0.00  0.12 0.00  0.10
Crit Moves:             ****  ****                                ****
Green/Cycle: 0.00 0.39  0.39  0.25 0.64  0.00  0.00 0.00  0.00  0.30 0.00  0.30
Volume/Cap:  0.00 0.27  0.39  0.39 0.10  0.00  0.00 0.00  0.00  0.39 0.00  0.33
Uniform Del:  0.0 20.8  22.0  30.9  6.8   0.0   0.0  0.0   0.0  27.9  0.0  27.3
IncremntDel:  0.0  0.2   0.4   0.6  0.0   0.0   0.0  0.0   0.0   0.5  0.0   0.4
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   0.00 1.00  1.00  1.00 1.00  0.00  0.00 0.00  0.00  1.00 0.00  1.00
Delay/Veh:    0.0 21.0  22.4  31.5  6.9   0.0   0.0  0.0   0.0  28.3  0.0  27.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 21.0  22.4  31.5  6.9   0.0   0.0  0.0   0.0  28.3  0.0  27.7
LOS by Move:   A    C     C     C    A     A     A    A     A     C    A     C
HCM2kAvgQ:      0    4     6     5    1     0     0    0     0     5    0     4
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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                      Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #3 C Street / Main Gate Road
********************************************************************************
Average Delay (sec/veh):      1.9       Worst Case Level Of Service: B[ 11.4]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  1  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0    16    0    77    36  316     0     0  252    15
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    16    0    77    36  316     0     0  252    15
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:     0    0     0    17    0    83    39  340     0     0  271    16
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0    0     0    17    0    83    39  340     0     0  271    16
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4  6.5   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5  4.0   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   696  696   279   287 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   411  368   765  1287 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   401  357   765  1287 xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.04 0.00  0.11  0.03 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  662 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx  0.5 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx 11.4 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     *    *     *     *    *     *
ApproachDel:    xxxxxx            11.4            xxxxxx           xxxxxx
ApproachLOS:         *               B                *                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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