



memorandum

date July 13, 2011

to Therese Brekke, Lennar Urban

from Jamie Galos, ESA

subject Noise, Air Quality and Greenhouse Gas Analysis Memorandum for a BCDC Bay Plan Port Priority Designation Removal Amendment

1.0 Introduction

ESA has prepared the following memorandum, which includes the noise, air quality and greenhouse gas (GHG) analysis for an amendment to the San Francisco Bay Conservation and Development Commission (BCDC) San Francisco Bay Plan (Bay Plan). The Bay Plan Amendment (project) involves removal of the Port Priority use designation at Hunters Point Shipyard in San Francisco, CA. The proposed amendment would remove approximately 73.4 acres from the Port Priority use area to facilitate the development of three potential land use scenarios. The three proposed separate scenarios include a project scenario, a research and development (R&D) variant scenario, and a housing variant scenario. These scenarios are planned as part of the larger Candlestick Point-Hunters Point Shipyard Phase II project (hereafter referred to as “Redevelopment Project”). The Redevelopment Project was previously analyzed within an Environmental Impact Report (EIR) prepared pursuant to the California Environmental Quality Act (CEQA). The Redevelopment Project EIR was certified by the San Francisco Redevelopment Agency and the Planning Commission of the City and County of San Francisco on June 3, 2010. The Board of Supervisors of the City and County of San Francisco affirmed the Planning Commission’s certification on July 13, 2010. This memorandum focuses on the noise, air quality and GHG impacts associated with the proposed amendment and proposed future land uses within the proposed amended boundaries.

2.0 Project Description

The project includes the removal of approximately 73.4 acres (removed land) from the BCDC Port Priority land use designation located in Hunters Point Shipyard in San Francisco, CA. The designation removal area constitutes the project site for this analysis. This memorandum will analyze three potential land use scenarios associated with the Port Priority designation removal; the project scenario, a R&D variant scenario, and a housing variant scenario.

Project Scenario

Under the project scenario, the approximately 73.4 acres of removed land is proposed to be Parks and Open Space land use associated with a proposed professional football stadium, and includes 38.0 acres of shoreline open space, 30.6 acres of dual-use sports fields/lawn, and 4.8 acres of roadway (Lennar Urban, 2011). For purposes of the present analysis, the project scenario does not include the stadium; only support facilities and open space and

park areas immediately adjacent. The dual-use sports field and lawn would also be used as stadium parking for 12 game days and 20 other stadium events per year. Construction of the stadium and associated park and open space areas would begin in 2011 with scheduled completion by 2017 (SFRA, 2009).

R&D Variant Scenario

Under the R&D variant scenario, the approximately 73.4 acres of removed land is proposed to be Parks and Open Space and R&D land use, and includes 66.2 acres of Shoreline Open Space, 4.1 acres of R&D offices, and 3.1 acres of roadway (Lennar Urban, 2011). The removed land designation area includes R&D scenario Blocks: 12, 13, and 15 (**Table 2-1**). Open space development would include construction of a waterfront promenade, multi-use lawn, waterfront recreation and education areas, as well as naturalized landscapes (SFRA, 2009). Buildout of the R&D uses and roadways would begin in 2017 with completion by 2021. The open space construction would occur from 2017 through 2021 in areas immediately adjacent to the R&D developments, with other open space area construction occurring from 2021 through 2025 (SFRA, 2009).

**TABLE 2-1
R&D VARIANT BLOCK UNITS WITHIN
PROPOSED REMOVAL LAND**

R&D Block	Square Feet in Port Priority Area
12	60,000
13	70,000
15	49,500
Total	179,500

SOURCE: Lennar Urban, 2011; ESA, 2011

Housing Variant Scenario

Under the housing variant scenario, the approximately 73.4 acres of removed land is proposed to be Parks and Open Space and Residential land use, and includes 65.8 acres of Shoreline Open Space, 3.9 acres of Residential, and 3.7 acres of roadway (Lennar Urban, 2011). The housing variant scenario includes residential Blocks: 15b, 16b, 17a, 17b, 18a, and 18b (**Table 2-2**). Open space development would include construction of a waterfront promenade, multi-use lawn, waterfront recreation and education areas, as well as naturalized landscapes (SFRA, 2009). Residential and open space development would begin in 2017 with completion in 2021 (SFRA, 2009).

**TABLE 2-2
HOUSING VARIANT BLOCK UNITS WITHIN
PROPOSED REMOVAL LAND**

R&D Block	Units in Port Priority Zone
15b	2
16b	44
17a	24
17b	75
18a	21
18b	10
Total	176

SOURCE: Lennar Urban, 2011; ESA, 2011

3.0 Environmental Analysis

3.1 Noise

Project Scenario

Construction

Noise Exposure

Construction activities associated with the project scenario including the development of open space and dual use sports fields would generate temporary and periodic increases in noise exposure for off-site noise sensitive receptors (existing residential neighborhoods more than 500 feet to the north). Construction activities including demolition, paving, and finishing could generate noise levels up to 89 db at 50 feet. Construction noise at these levels would attenuate to approximately 69 dB Leq at the closest residences 500 feet away. The City of San Francisco Municipal Code generally prohibits construction between the hours of 8 p.m.-7 a.m. (nighttime, sleep hours) if the generated noise has the potential to exceed the ambient noise level by 5 dB or more. Furthermore, the Code limits noise from any individual piece of construction equipment (except impact tools) to 80 dB at 100 feet unless the construction activity will occur during the designated daytime hours. Project scenario construction would not occur during recognized sleep hours (8 p.m.-7 a.m.), and would be consistent with the requirements of the City of San Francisco Municipal Code (Sections 2907 and 2908, Construction). The Redevelopment Project EIR identified, and the City and Redevelopment Agency adopted, **Mitigation Measures NO-1a.1** and **NO-1a.2** which require techniques to reduce noise levels during construction. Construction noise is anticipated to be less than significant and would be further reduced by the adopted mitigation.

Vibration Exposure

Demolition, grading, and other vibration-creating operations associated with the project scenario would generally occur more than 500 feet from the closest off-site acoustically-sensitive receptors. Due to the distance removed from construction operations, vibration exposure associated with project scenario construction is expected to be less than significant.

Noise Level Increases

Construction activities associated with the project scenario would result in temporary and periodic noise level increases relative to ambient noise levels in the project site vicinity. The Redevelopment Project EIR identified, and the City and Redevelopment Agency adopted, **Mitigation Measures NO-1a.1** and **NO-1a.2** which require techniques to reduce noise levels during project scenario construction. These measures would be expected to substantially reduce construction-related noise exposure and associated increases above the ambient noise level in the project site vicinity. Resulting construction-related noise exposure increases would be considered less than significant.

Operations

Stationary Noise Sources

Primary noise sources associated with daily operations at the project site include use of the proposed dual use sports fields (i.e., team sporting events) and landscape maintenance. These sources are expected to be more than 500 feet removed from the closest noise-sensitive receptors to the north, and noise exposure from these operations is not expected to exceed the applicable City of San Francisco noise exposure limits. This impact is considered less than significant.

Vibration Sources

No identifiable sources of excessive ground-borne vibration are proposed as part of the project scenario. This impact is considered less than significant.

Traffic Noise

The significance criteria for project scenario traffic noise exposure is based on FTA criteria, pursuant to which higher baseline ambient noise levels have lower thresholds for significant traffic noise level increases. Under these criteria, in existing residential areas with baseline ambient noise levels of 50, 55, and 60 dB L_{eq} , an increase of 5, 3, and 2 dB or more, respectively, would be considered significant.

Traffic noise exposure was calculated using the Federal Highway Administration’s (FHWA) Traffic Noise Model (TNM) 2.5, peak-hour traffic volume information provided by Fehr & Peers (July 2011), and the truck distribution assumed for the Redevelopment Project EIR traffic noise analysis. The analysis considers trips generated by the uses to be developed on the land subject to the proposed Bay Plan amendment. Traffic noise exposure in the project site vicinity is summarized in **Table 3.1-1**.

**TABLE 3.1-1
MODELED EXISTING TRAFFIC NOISE LEVELS – PROJECT SCENARIO**

Weekday Peak-Hour Noise Level, 50 Feet from Centerline – dB L_{dn} ^a					
Roadway Segment	Existing No Project Scenario ^b	Existing w/ Project Scenario ^c	Difference, dB	Acceptable Increase	Significance (Yes/No)
Griffith Street north of Palou Ave.	59.1	59.1	0.0	2	No
Griffith Street south of Palou Ave.	58.6	58.6	0.0	2	No
Crisp Road east of Griffith Ave.	56.2	56.1	-0.1	3	No
Palou Ave. west of Griffith Street	57.2	57.6	0.4	3	No
Donahue Street north of Innes Ave.	56.1	54.3	-1.8	3	No
Donahue Street south of Innes Ave.	54.3	54.3	0.0	3	No
Innes Ave. west of Donahue Street	55.6	57.1	1.5	3	No

a Noise levels were determined using FHWA TNM 2.5.
b Existing No Project Scenario based on Fehr and Peers traffic study, July 2011.
c Existing with Project Scenario adds Project Scenario traffic volumes provided by Fehr & Peers to existing traffic volumes.
SOURCE: Fehr & Peers, 2011; ESA, 2011

As shown in **Table 3.1-1**, off-site traffic noise level increases are not expected to exceed 1.5 dB, within the acceptable level of increase. Therefore, traffic noise level increases would be less than significant.

Stadium Noise and Aircraft Noise

As the project scenario does not propose the development of noise-sensitive receptors (such as new residences), there would be no on-site impacts associated with exposure to stadium noise or aircraft noise.

Cumulative

A cumulative impact arises when two or more individual projects, when considered together, are considerable or compound or increase other environmental impacts. A project that would individually have a significant noise impact would also contribute significantly to a cumulative noise impact.

Construction Noise and Vibration

As discussed above, project scenario construction would be expected to add to the noise environment within the neighboring residential communities to the north. The overall Redevelopment Project includes pile driving activities which could reach levels as high as 91 dB L_{eq} /101 dB L_{max} and 103 VdB PPV at neighboring residential receptors, which would be considered significant. As described above, **Mitigation Measures NO-1a.1, NO-1a.2, and NO-2a** have been adopted for the overall Redevelopment Project to reduce construction noise and vibration impacts. Still, these measures would not be expected to reduce the impacts to less than significant levels. Therefore, construction noise and vibration impacts in the project site vicinity would be considered cumulatively significant and unavoidable.

Traffic Noise

The project scenario would generate on-going noise exposure primarily from local traffic operations. Many of the other anticipated projects in the region would also contribute to noise in the area due to increased traffic volumes. The significance of traffic noise level increases is based on the FTA criteria. Under these criteria, in existing residential areas with baseline ambient noise levels of 50, 55, and 60 dB L_{eq} , a project scenario-related increase of 5, 3, and 2 dB or more, respectively, would be considered significant.

As shown in **Table 3.1-2**, traffic noise level increases in the project site vicinity are expected to be cumulatively significant along sections of Griffith Street, Crisp Road, and Palou Avenue, and Innes Avenue. It should be noted that the contribution of the project scenario to traffic noise exposure increases along these roadway segments is 0 dB and thus is not a considerable contribution to the cumulative impact.

**TABLE 3.1-2
MODELED CUMULATIVE TRAFFIC NOISE LEVELS – PROJECT SCENARIO**

Weekday Peak-Hour Noise Level, 50 Feet from Centerline – dB L_{dn}							
Roadway Segment	Existing (a)	Cumulative No Project Scenario (b)	Cumulative Plus Project Scenario (c)	Cumulative Change (Difference, dB [c-a])	Project Contribution (Difference, dB [c-b])	Cumulatively Significant? (Yes/No)	Cumulatively Considerable? (Yes/No)
Griffith Street north of Palou Ave.	59.1	62.0	62.0	2.9	0.0	Yes	No
Griffith Street south of Palou Ave. ¹	58.6	64.0	64.0	5.4	0.0	No	No
Crisp Road east of Griffith Ave. ²	56.2	65.9	65.9	9.7	0.0	Yes	No
Palou Ave. west of Griffith Street	57.2	64.7	64.7	7.5	0.0	Yes	No
Donahue Street north of Innes Ave. ¹	56.1	57.5	65.6	9.5	8.1	No	No
Donahue Street south of Innes Ave.	54.3	N/A	52.1	-2.2	N/A	No	N/A
Innes Ave. east of Donahue Street ¹	N/A	66.1	58.3	N/A	-7.8	N/A	No
Innes Ave. west of Donahue Street	55.6	66.5	66.2	10.6	-0.3	Yes	No

Notes:

Noise levels were determined using the FHWA TNM 2.5 with traffic volume data provided by Fehr & Peers.

Cumulative plus project scenario is comprised of the Redevelopment Project site (including the lands subject to the proposed park priority amendment) along with other reasonably foreseeable projects in the area.

¹ No residential receptors currently exist or are proposed along this roadway segment.

² Potential for residential construction.

SOURCE: Fehr & Peers, 2011; ESA, 2011

R&D Variant Scenario

Construction

Noise Exposure

Construction activities associated with the uses proposed for the subject lands under the R&D variant project would generate temporary increases in noise exposure for off-site noise sensitive receptors (existing residential neighborhoods more than 500 feet to the north). Construction activities including pile driving for new structures could generate noise levels up to 101 dbA. Construction noise at these levels would attenuate to approximately 81 dB Leq at the closest residences 500 feet away. The City of San Francisco Municipal Code generally prohibits construction between the hours of 8 p.m.-7 a.m. if the generated noise has the potential to exceed the ambient noise level by 5 dB or more. Furthermore, the Code limits noise from any individual piece of construction equipment (except impact tools) to 80 dB at 100 feet unless the construction activity will occur during the designated daytime hours. Construction would not occur during recognized sleep hours (8 p.m.-7 a.m.), and would be consistent with the requirements of the City of San Francisco Municipal Code (Sections 2907 and 2908, Construction). The Redevelopment Project EIR identified, and the City and Redevelopment Agency adopted, **Mitigation Measures NO-1a.1** and **NO-1a.2** which require techniques to reduce noise levels during construction. With the application of these measures, construction activities would have a less than significant impact.

Vibration Exposure

Construction activities associated with the R&D variant project, including assumed pile driving operations for building construction and shoreline improvements, would occur more than 500 feet from the closest acoustically-sensitive receptors. Due to the distance removed from construction operations, vibration exposure associated with the R&D variant project is expected to be less than significant. The Redevelopment Project EIR identified, and the City and Redevelopment Agency adopted, **Mitigation Measures NO-1a.1**, **NO-1a.2**, and **NO-2a** which require techniques to reduce noise levels during construction and pile driving, and vibration monitoring of buildings within 50 feet of pile driving activities.

Noise Level Increases

Construction activities associated with the R&D variant project would result in temporary and periodic noise level increases relative to ambient noise levels in the project site vicinity. The Redevelopment Project EIR identified, and the City and Redevelopment Agency adopted, **Mitigation Measures NO-1a.1** and **NO-1a.2** which require techniques to reduce noise levels during R&D variant project construction. These measures would be expected to substantially reduce construction-related noise exposure and associated ambient noise level increases in the project site vicinity. Resulting construction-related noise exposure increases would be considered less than significant.

Operations

Stationary Noise Sources

Daily activities associated with the R&D variant project would not be expected to expose noise-sensitive receptors in the project site vicinity to noise in excess of the applicable City of San Francisco noise exposure criteria. As presented on Page III.I-40 of the Redevelopment Project EIR (**Impact NO-4**), noise exposure from large-scale mechanical systems (i.e. cooling systems) would be expected to range from 50-65 dB L_{eq}/L_{max} at a distance of 50 feet. These units would be mounted on rooftops within mechanical wells of the proposed buildings, and would be shielded from neighboring receptors by building construction. Resulting noise exposure would not

be expected to significantly increase ambient noise levels at existing noise-sensitive receptors over 500 feet from the project site.

The delivery of goods to R&D variant project facilities via tractor-trailer trucks would add to the area noise environment. It is expected that deliveries in the project site vicinity would be made primarily during daytime hours, and that heavy truck operations noise exposure would be minimal. Any loading docks would be appropriately screened by proposed building and loading dock structures. Noise exposure from heavy truck movements and loading dock operations is not expected to exceed the applicable City of San Francisco noise exposure limits at the closest residential uses to the north. Noise impacts from stationary sources of noise associated with the R&D variant project are considered less than significant.

Vibration Sources

No identifiable sources of excessive ground-borne vibration are proposed as part of the R&D variant project. This impact is considered less than significant.

Traffic Noise

The significance criteria for traffic noise exposure is based on the FTA criteria, pursuant to which higher baseline ambient noise levels have lower thresholds for significant traffic noise level increases. Under these criteria, in existing residential areas with baseline ambient noise levels of 50, 55, and 60 dB L_{eq} , a scenario-related increase of 5, 3, and 2 dB or more, respectively, would be considered significant.

Traffic noise exposure was calculated using the FHWA TNM 2.5, peak-hour traffic volume information provided by Fehr & Peers (July 2011), and the truck distribution assumed for the Redevelopment Project EIR traffic noise analysis (2% MT/1% HT). Traffic noise exposure in the project site vicinity is summarized in **Table 3.1-3**.

**TABLE 3.1-3
MODELED EXISTING TRAFFIC NOISE LEVELS – R&D VARIANT PROJECT SCENARIO**

Weekday Peak-Hour Noise Level, 50 Feet from Centerline – dB L_{dn} ^a					
Roadway Segment	Existing No R&D Variant Project ^b	Existing w/ R&D Variant Project ^c	Difference, dB	Acceptable Increase	Significance (Yes/No)
Griffith Street north of Palou Ave.	59.1	59.1	0.0	2	No
Griffith Street south of Palou Ave.	58.6	58.7	0.1	2	No
Crisp Road east of Griffith Ave.	56.2	57.1	0.9	3	No
Palou Ave. west of Griffith Street	57.2	58.1	0.9	3	No
Donahue Street north of Innes Ave.	56.1	55.6	-0.5	3	No
Donahue Street south of Innes Ave.	54.3	54.3	0.0	3	No
Innes Ave. west of Donahue Street	55.6	58.0	2.4	3	No

a Noise levels were determined using FHWA TNM 2.5.
b Existing No R&D Variant Project based on Fehr and Peers traffic study, July 2011.
c Existing with R&D Variant Project adds R&D variant project traffic volumes provided by Fehr & Peers to existing traffic volumes.

SOURCE: Fehr & Peers, 2011; ESA, 2011

As shown in **Table 3.1-3**, off-site traffic noise level increases are not expected to exceed 2.4 dB, and are below the established thresholds of significance. Therefore, traffic noise level increases would be less than significant.

Aircraft Noise

As the R&D variant project does not propose the development of noise-sensitive receptors (such as new residences), there would be no on-site impacts associated with exposure to aircraft noise.

Cumulative

Construction Noise and Vibration

As discussed above, construction of the R&D variant project would be expected to add to the noise environment within the neighboring residential communities to the north. The overall Redevelopment Project includes pile driving activities which could reach levels as high as 91 dB L_{eq} /101 dB L_{max} and 103 VdB PPV at neighboring residential receptors, which would be considered significant. As described above, **Mitigation Measures NO-1a.1**, **NO-1a.2**, and **NO-2a** have been adopted for the overall Redevelopment Project to reduce construction noise and vibration impacts. Still, these measures would not be expected to reduce the impacts to less than significant levels. Therefore, construction noise and vibration impacts in the project site vicinity would be considered cumulatively significant and unavoidable.

Traffic Noise

The R&D variant project would generate on-going noise exposure primarily from local traffic operations generated by the uses developed on the land removed from the port priority use area. Many of the other anticipated projects in the region would also contribute to noise in the area due to increased traffic volumes. The significance of traffic noise level increases is based on the FTA criteria. Under these criteria, in existing residential areas with baseline ambient noise levels of 50, 55, and 60 dB L_{eq} , a scenario-related increase of 5, 3, and 2 dB or more, respectively, would be considered significant.

As shown in **Table 3.1-4**, traffic noise level increases in the project site vicinity are expected to be cumulatively significant along sections of Griffith Street, Crisp Road, Palou Avenue, Innes Avenue and Donahue Street. It should be noted that the contribution of the R&D variant project to traffic noise exposure increases along these roadway segments is 0.3 or less for all but one roadway which is not a considerable contribution to the cumulative impact. A considerable contribution from the R&D variant project would occur at Innes Avenue west of Donahue Street. Cumulative Plus R&D Variant Project traffic noise exposure at a 50-foot residential building setback along Innes Avenue west of Donahue Street is expected to exceed the applicable 65 dB L_{dn} noise exposure limit established in the City of San Francisco Noise Element of the General Plan. This impact is considered cumulatively significant and unavoidable.

**TABLE 3.1-4
MODELED CUMULATIVE TRAFFIC NOISE LEVELS – R&D VARIANT PROJECT SCENARIO**

Weekday Peak-Hour Noise Level, 50 Feet from Centerline – dB L _{dn}							
Roadway Segment	Existing (a)	Cumulative No R&D Variant Project (b)	Cumulative Plus R&D Variant Project (c)	Cumulative Change (Difference, dB [c-a])	Project Contribution (Difference, dB [c-b])	Cumulatively Significant? (Yes/No)	Cumulatively Considerable? (Yes/No)
Griffith Street north of Palou Ave.	59.1	62.0	62.0	2.9	0.0	Yes	No
Griffith Street south of Palou Ave. ¹	58.6	64.6	64.9	6.3	0.3	Yes	No
Crisp Road east of Griffith Ave. ²	56.2	67.1	67.2	11.0	0.1	Yes	No
Palou Ave. west of Griffith Street	57.2	65.7	65.9	8.7	0.2	Yes	No
Donahue Street north of Innes Ave. ¹	56.1	66.7	66.8	10.7	0.1	Yes	No
Donahue Street south of Innes Ave.	54.3	52.1	52.1	-2.2	0.0	No	No
Innes Ave. east of Donahue Street ¹	N/A	64.2	57.8	N/A	-6.4	N/A	No
Innes Ave. west of Donahue Street	55.6	64.4	67.2	11.6	2.8	Yes	Yes

Notes:

Noise levels were determined using the FHWA TNM 2.5 with traffic volume data provided by Fehr & Peers.

Cumulative plus R&D Variant Project is comprised of the Redevelopment Project site (including the lands subject to the proposed park priority amendment) along with other reasonably foreseeable projects in the area.

¹ No residential receptors currently exist or are proposed along this roadway segment.

² Potential for residential construction.

SOURCE: Fehr & Peers, 2011; ESA, 2011

Housing Variant Scenario

Construction

Noise Exposure

Construction activities associated with the uses to be developed on the subject lands under the housing variant project would generate temporary increases in noise exposure for off-site noise sensitive receptors (existing residential neighborhoods more than 500 feet to the north). Construction activities including pile driving for new structure could generate noise levels up to 101 dbA. Construction noise at these levels would attenuate to approximately 81 dB Leq at the closest residences 500 feet away. The City of San Francisco Municipal Code generally prohibits construction between the hours of 8 p.m.-7 a.m. if the generated noise has the potential to exceed the ambient noise level by 5 dB or more. Furthermore, the Code limits noise from any individual piece of construction equipment (except impact tools) to 80 dB at 100 feet unless the construction activity will occur during the designated daytime hours. Construction of the housing variant project would not occur during recognized sleep hours (8 p.m.-7 a.m.), and would be consistent with the requirements of the City of San Francisco Municipal Code (Sections 2907 and 2908, Construction). The Redevelopment Project EIR identified, and the City and Redevelopment Agency adopted, **Mitigation Measures NO-1a.1** and **NO-1a.2** which require techniques to reduce noise levels during construction. With the application of these measures, construction activities would have a less than significant impact.

Vibration Exposure

Construction activities associated with the housing variant project, including assumed pile driving operations for building construction and shoreline improvements, would occur more than 500 feet from the closest acoustically

sensitive receptors. Due to the distance removed from proposed pile driving operations, vibration exposure associated with the housing variant project is expected to be less than significant. The Redevelopment Project EIR identified, and the City and Redevelopment Agency adopted, **Mitigation Measures NO-1a.1, NO-1a.2, and NO-2a** which require techniques to reduce noise levels during construction and pile driving, and vibration monitoring of buildings within 50 feet of pile driving activities.

Noise Level Increases

Construction activities associated with the housing variant project would result in temporary and periodic noise level increases relative to ambient noise levels in the project site vicinity. The Redevelopment Project EIR identified, and the City and Redevelopment Agency adopted, **Mitigation Measures NO-1a.1 and NO-1a.2** which require techniques to reduce noise levels during proposed construction. These measures would be expected to substantially reduce construction-related noise exposure and associated ambient noise level increases in the project site vicinity. Resulting construction-related noise exposure increases would be considered less than significant.

Operations

Stationary Noise Sources

Daily activities associated with the housing variant project would not be expected to expose noise-sensitive receptors in the project site vicinity to noise in excess of the applicable City of San Francisco noise exposure criteria. As presented on Page III.I-40 of the Redevelopment Project EIR (**Impact NO-4**), noise exposure from large-scale mechanical systems (i.e. cooling systems) would be expected to range from 50-65 dB L_{eq}/L_{max} at a distance of 50 feet. These units would be mounted on rooftops within mechanical wells of the proposed buildings, and would be shielded from neighboring receptors by building construction. Resulting noise exposure would not be expected to significantly increase ambient noise levels at existing noise-sensitive receptors over 500 feet from the project site.

Delivery of goods to off-site commercial/industrial uses in the project site vicinity, as well as refuse pick up for commercial and residential uses in the project site vicinity, would contribute to the noise environment. Noise exposure associated with neighboring, off-site loading docks (truck deliveries) would be appropriately screened by proposed buildings and the loading dock structures. Noise exposure from these operations is not expected to exceed the applicable City of San Francisco noise exposure limits. Additionally, noise exposure from other off-site operations (e.g., landscape maintenance) would be comparable to a typical urban environment. This impact is considered less than significant.

Vibration Sources

Daily activities associated with the housing variant project and overall Redevelopment Project EIR would not be expected to expose sensitive on- or off-site receptors to excessive ground-borne vibration. No identifiable sources of excessive ground-borne vibration are proposed as part of the housing variant project or within the overall Redevelopment Project (**Impact NO-5** in the Redevelopment Project EIR). Vibration levels in the project site vicinity would be typical of an urban setting, and would not be expected to exceed the FTA 80VdB PPV threshold at sensitive receptor locations. This impact is considered less than significant.

Traffic Noise

The significance criteria for traffic noise exposure is based on the FTA criteria, pursuant to which higher baseline ambient noise levels have lower thresholds for significant traffic noise level increases. Under these criteria, in existing residential areas with baseline ambient noise levels of 50, 55, and 60 dB L_{eq} , a scenario-related increase of 5, 3, and 2 dB or more, respectively, would be considered significant.

Traffic noise exposure was calculated using the FHWA TNM 2.5, peak-hour traffic volume information provided by Fehr & Peers (July 2011), and the truck distribution assumed for the Redevelopment Project EIR traffic noise analysis. The analysis includes trips generated by housing and open space development on the land removed from the port priority use area. Traffic noise exposure in the project site vicinity is summarized in **Table 3.1-5**.

**TABLE 3.1-5
MODELED EXISTING TRAFFIC NOISE LEVELS – HOUSING VARIANT SCENARIO**

Weekday Peak-Hour Noise Level, 50 Feet from Centerline – dB L _{dn} ^a					
Roadway Segment	Existing No Housing Variant Project ^b	Existing with Housing Variant Project ^c	Difference, dB	Acceptable Increase	Significance (Yes/No)
Griffith Street north of Palou Ave.	59.1	59.1	0.0	2	No
Griffith Street south of Palou Ave.	58.6	58.7	0.1	2	No
Crisp Road east of Griffith Ave.	56.2	56.7	0.5	3	No
Palou Ave. west of Griffith Street	57.2	57.9	0.7	3	No
Donahue Street north of Innes Ave.	56.1	56.7	0.6	3	No
Donahue Street south of Innes Ave.	54.3	54.3	0.0	3	No
Innes Ave. west of Donahue Street	55.6	56.6	1.0	3	No

a Noise levels were determined using FHWA TNM 2.5.

b Existing No Housing Variant Project based on Fehr and Peers traffic study, July 2011.

c Existing with Housing Variant Project adds housing variant project traffic volumes provided by Fehr & Peers to existing traffic volumes.

SOURCE: Fehr & Peers, 2011; ESA, 2011

As shown in **Table 3.1-5**, off-site traffic noise level increases are not expected to exceed 1.0 dB, and are below the established thresholds of significance. Therefore, traffic noise level increases are expected to be less than significant.

Aircraft Noise

Future residences developed under the housing variant project would not be exposed to excessive noise exposure from aircraft operations associated with San Francisco International Airport (SFO). As presented on Page III.I-52 of the Redevelopment Project EIR (**Impact NO-8**), SFO aircraft noise exposure is expected to be well below 65 dB L_{dn} at the project site and vicinity. Additionally, the expected probability of sleep disturbance from SFO operations is expected to be very low. This impact is considered less than significant.

Cumulative

Construction Noise and Vibration

As discussed above, construction of the housing variant project would be expected to add to the noise environment within the neighboring residential communities to the north. Temporary increases in ambient noise and vibration levels would be considered significant. As described above, **Mitigation Measures NO-1a.1, NO-1a.2, and NO-2a** have been adopted for the overall Redevelopment Project to reduce construction noise and vibration impacts. Still, these measures would not be expected to reduce the impacts to less than significant levels. Therefore, construction noise and vibration impacts in the project site vicinity would be considered cumulatively significant and unavoidable.

Traffic Noise

The housing variant project would generate on-going noise exposure primarily from local traffic operations. Many of the other anticipated projects in the region would also contribute to noise in the area due to increased traffic volumes. The significance of traffic noise level increases is based on the FTA criteria. Under these criteria, in existing residential areas with baseline ambient noise levels of 50, 55, and 60 dB L_{eq} , a scenario-related increase of 5, 3, and 2 dB or more, respectively, would be considered significant.

As shown in **Table 3.1-6**, traffic noise level increases in the project site vicinity are expected to be cumulatively significant along sections of Griffith Street, Crisp Road, Palou Avenue, Donahue Street, and Innes Avenue. The contribution of the housing variant project to traffic noise exposure increases along these roadway segments is 0.5 dB or less for all roadways which is not a considerable contribution to the cumulative impact.

**TABLE 3.1-6
MODELED CUMULATIVE TRAFFIC NOISE LEVELS – HOUSING VARIANT SCENARIO**

Weekday Peak-Hour Noise Level, 50 Feet from Centerline – dB L_{dn}							
Roadway Segment	Existing (a)	Cumulative No Housing Variant Project (b)	Cumulative Plus Housing Variant Project (c)	Cumulative Change (Difference, dB [c-a])	Project Contribution (Difference, dB [c-b])	Cumulatively Significant? (Yes/No)	Cumulatively Considerable? (Yes/No)
Griffith Street north of Palou Ave.	59.1	62	62	2.9	0.0	Yes	No
Griffith Street south of Palou Ave. ¹	58.6	64.0	64.5	5.9	0.5	Yes	No
Crisp Road east of Griffith Ave. ²	56.2	65.8	65.9	9.7	0.1	Yes	No
Palou Ave. west of Griffith Street	57.2	64.7	65.1	7.9	0.4	Yes	No
Donahue Street north of Innes Ave. ¹	56.1	65.9	65.9	9.8	0.0	Yes	No
Donahue Street south of Innes Ave.	54.3	52.1	52.1	-2.2	0.0	No	No
Innes Ave. east of Donahue Street ¹	N/A	57.8	57.8	N/A	0.0	N/A	No
Innes Ave. west of Donahue Street	55.6	66.3	66.4	10.8	0.1	Yes	No

Notes:

Noise levels were determined using the FHWA TNM 2.5 with traffic volume data provided by Fehr & Peers.

Cumulative plus Housing Variant Project is comprised of the Redevelopment Project site (including the lands subject to the proposed park priority amendment) along with other reasonably foreseeable projects in the area.

¹ No residential receptors currently exist or are proposed along this roadway segment.

² Potential for residential construction.

SOURCE: Fehr & Peers, 2011; ESA, 2011

3.2 Air Quality

Thresholds for All Scenarios

Construction

This analysis uses Federal General Conformity thresholds and adopted Bay Area Air Quality Management District (BAAQMD) thresholds to determine the significance of impacts. The General Conformity Rule ensures that projects in nonattainment areas do not interfere with plans to meet national air quality standards. The San

Francisco Bay Area is currently designated as marginal nonattainment for the 8-hour ozone standard and nonattainment for the PM 2.5 standard (U.S. EPA, 2011). The BAAQMD adopted new thresholds of significance in June 2010, which are included in the updated *CEQA Air Quality Guidelines* (BAAQMD, 2011). These thresholds are listed below:

General Conformity Thresholds (U.S. EPA, 2010)

- Ozone Precursors:
 - Reactive Organic Gases (ROG): 100 tons per year
 - Nitrogen Oxides (NOx): 100 tons per year
- Fine Particulate Matter (PM2.5): 100 tons per year

BAAQMD Construction Thresholds (BAAQMD, 2011)

- ROG: 54 pounds per day
- NOx: 54 pounds per day
- Respirable Particulate Matter (PM10) (exhaust only): 82 pounds per day
- PM2.5 (exhaust only): 54 pounds per day
- PM10 and PM2.5 fugitive dust: implement best management practices (BMPs)

Construction emissions of criteria pollutants associated with the project scenarios were quantified using the URBEMIS 2007 model and data gathered for the Redevelopment Project EIR. Assumptions and results of the analysis are described below for each scenario.

Operation

This analysis uses Federal General Conformity thresholds and adopted BAAQMD thresholds to determine the significance of impacts. Therefore, operational criteria pollutant emissions were calculated and compared to the General Conformity thresholds described above, as well as the following significance thresholds:

BAAQMD Operational Thresholds (BAAQMD, 2011)

- ROG: 10 tons per year
- NOx: 10 tons per year
- PM10: 15 tons per year
- PM2.5: 10 tons per year
- Contribute to carbon monoxide (CO) concentrations exceeding the State Ambient Air Quality Standard of 9 parts per million (ppm) averaged over 8 hours and 20 ppm for 1 hour

Operational emissions of criteria pollutants associated with the project scenarios were quantified using the URBEMIS 2007 model and data gathered for the Redevelopment Project EIR. Assumptions and results of the analysis are described below for each scenario.

Cumulative

BAAQMD guidance states that by its very nature, air pollution is largely a cumulative impact. According to the BAAQMD, no single project is sufficient in size to, by itself, result in nonattainment of ambient air quality

standards. Instead, a project’s individual emissions contribute to existing cumulatively significant adverse air quality impacts. In addition, according to the BAAQMD *CEQA Air Quality Guidelines*, if a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region’s existing air quality conditions (BAAQMD, 2011). Alternatively, if a project does not exceed the identified significance thresholds, then the project would not be considered cumulatively considerable and would result in less-than-significant air quality impacts.

Project Scenario

Construction

Criteria pollutant construction emissions for the development of open space and dual use sports fields on the lands subject to the proposed amendments under the project scenario were calculated and are depicted below in **Table 3.2-1** (Annual Emissions) and **Table 3.2-2** (Daily Emissions). As shown in these tables, proposed construction would generate unmitigated emissions of criteria pollutants that would be less than the respective General Conformity Rule and BAAQMD significance thresholds and would therefore have a less than significant impact related to construction emissions of criteria pollutants. Also the Redevelopment Project EIR identified, and the City and Redevelopment Agency adopted, **Mitigation Measure HZ-15**, which requires fugitive dust control to meet BAAQMD requirements.

**TABLE 3.2-1
ESTIMATED ANNUAL UNMITIGATED CONSTRUCTION EMISSIONS^{A,B}**

Construction Phase	Criteria Pollutant Emissions (tons per year)			
	ROG	NOx	PM10	PM2.5
2012	1	5	45	10
2013	<1	3	21	4
<i>General Conformity Significance Threshold</i>	<i>100</i>	<i>100</i>	<i>NA</i>	<i>100</i>
Do the Worst-Case Year Emissions Exceed Thresholds?	No	No	No	No

a Emissions were modeled using URBEMIS 2007. It was assumed that 68.6 acres of open space and parks and 4.8 acres of roadway would be developed during the years 2012 through 2013. Additional information is included in Appendix AIR.
b **Bold** values denote emissions that exceed the applicable threshold.

**TABLE 3.2-2
ESTIMATED DAILY UNMITIGATED CONSTRUCTION EMISSIONS**

Construction Phase	Unmitigated Criteria Pollutant Emissions (pounds per day)			
	ROG	NOx	PM10 (Exhaust)	PM2.5 (Exhaust)
2012	5	39	2	2
2013	7	50	3	3
<i>BAAQMD Significance Threshold</i>	<i>54</i>	<i>54</i>	<i>82</i>	<i>54</i>
Do the Worst-Case Day Emissions Exceed Thresholds?	No	No	No	No

a Emissions were modeled using URBEMIS 2007. It was assumed that 68.6 acres of open space and parks and 4.8 acres of roadway would be developed during the years 2012 through 2013. Additional information is included in Appendix AIR.
b **Bold** values denote emissions that exceed the applicable threshold.

The BAAQMD *CEQA Guidelines* have an established threshold of 10 in 1,000,000 persons affected by carcinogenic health risks. A Health Risk Assessment (HRA) prepared for the Redevelopment Project EIR found construction would have potentially significant impacts with regard to toxic air contaminants (TACs) and diesel particulate matter (DPM). The Redevelopment Project EIR therefore identified, and the City and Redevelopment Agency adopted, **Mitigation Measure AQ-2.1**, which requires the reduction of DPM emissions during construction through emission control technology for particulate matter. This measure will require that 50% of the construction fleet meet U.S. Environmental Protection Agency Tier 2 standards outfitted with California Air Resources Board Level 3 Verified Diesel Emission Control Strategies for particulate matter control (or equivalent) during 2010 and 2011 construction activities, with requirements increasing to 75% of the fleet in 2012, and 100% of the fleet in 2013 and for construction duration. With the application of this mitigation to the current project scenario, construction activities will have less than significant impacts related to air emissions of TACs.

Operations

As shown in **Table 3.2-3**, operation of the uses on the subject lands under the project scenario would generate emissions of criteria pollutants that would be less than the respective General Conformity Rule or BAAQMD significance thresholds. Thus, the project scenario would result in a less than significant impact related to long-term operational emissions of criteria pollutants.

**TABLE 3.2-3
ESTIMATED ANNUAL OPERATION EMISSIONS^{A,B}**

Emission Source	Criteria Pollutant Emissions (tons/year)			
	ROG	NOx	PM10	PM2.5
Area	<1	0	0	0
Vehicle	<1	<1	<1	<1
Total	<1	<1	<1	<1
<i>General Conformity Significance Threshold</i>	<i>100</i>	<i>100</i>	<i>NA</i>	<i>100</i>
Exceed Thresholds?	No	No	No	No
<i>BAAQMD Significance Threshold</i>	<i>10</i>	<i>10</i>	<i>15</i>	<i>10</i>
Exceed Thresholds?	No	No	No	No

a Operational emissions were modeled using URBEMIS 2007 for the assumed 68.6 acres of open space, roadway and parks. Additional information is included in Appendix AIR.

b **Bold** values denote emissions that exceed the applicable threshold.

The Redevelopment Project EIR included CALINE4 modeling of localized CO emissions. The analysis showed that CO concentrations would not exceed the state or federal standards. As the proposed amendment and subsequent development would result in a small percentage of the vehicle trips generated by the Redevelopment Project as a whole, the CO emissions and concentration levels attributable to the development of the project site would also be less than significant.

The BAAQMD gives examples of land uses that have potential to generate considerable odors, including wastewater treatment plants, landfills, oil refineries, and chemical plants. The project scenario would not result in sources of substantial odor. This would be a less than significant impact.

Development of the project scenario is a part of the overall Redevelopment Project, which the Redevelopment Project EIR determined would conform to the current regional air quality plan. The project scenario would therefore conform as well and would have a less than significant effect on the current regional air quality plan.

Cumulative

Construction emissions are evaluated above in **Tables 3.2-1 and 3.2-2** and do not exceed General Conformity or BAAQMD thresholds of significance. Therefore cumulative construction criteria air pollutant impacts would be less than significant. The cumulative projects are residential and commercial uses which are not anticipated to be a new permitted toxic or particulate matter source. Furthermore, the project site is located over 1,000 feet from a freeway, which is the BAAQMD screening distance for estimating risk and hazard impacts from California highways and high volume arterial roadways in the Bay Area.

In regard to operations, as shown in **Table 3.2-3** above, the project scenario would not exceed General Conformity or BAAQMD thresholds for criteria air pollutants, nor would the project include new permitted toxic or particulate matter sources. Based on the analysis above, the construction and operational emissions related to development of the project scenario would not contribute considerably to a cumulative air quality impact.

R & D Variant Scenario

Construction

Criteria pollutant construction emissions for the uses developed on the lands to be removed from the port priority use area under the R&D variant project were calculated and are depicted below in **Table 3.2-4** (Annual Emissions) and **Table 3.2-5** (Daily Emissions). As shown in these tables, proposed construction would generate unmitigated emissions of criteria pollutants that would be less than the respective General Conformity Rule and BAAQMD significance thresholds and would therefore have a less than significant impact related to construction emissions of criteria pollutants. Further, the Redevelopment Project EIR identified, and the City and Redevelopment Agency adopted, **Mitigation Measure HZ-15**, which requires fugitive dust control to meet BAAQMD requirements.

**TABLE 3.2-4
ESTIMATED ANNUAL UNMITIGATED CONSTRUCTION EMISSIONS^{A,B}**

Construction Phase	Criteria Pollutant Emissions (tons per year)			
	ROG	NOx	PM10	PM2.5
2017	1	3	48	10
2018	1	3	22	5
2019	1	3	<1	<1
2020	2	2	<1	<1
<i>General Conformity Significance Threshold</i>	<i>100</i>	<i>100</i>	<i>NA</i>	<i>100</i>
Do the Worst-Case Year Emissions Exceed Thresholds?	No	No	No	No

a Emissions were modeled using URBEMIS 2007. It was assumed that 65.8 acres of open space, 179,500 square feet of R & D uses, and 3.1 acres of roadway would be developed during the years 2017 through 2020. Additional information is included in Appendix AIR.

b **Bold** values denote emissions that exceed the applicable threshold.

**TABLE 3.2-5
ESTIMATED DAILY UNMITIGATED CONSTRUCTION EMISSIONS**

Construction Phase	Unmitigated Criteria Pollutant Emissions (pounds per day)			
	ROG	NOx	PM10 (Exhaust)	PM2.5 (Exhaust)
2017	4	26	1	1
2018	5	34	2	2
2019	4	19	1	1
2020	19	18	1	1
<i>BAAQMD Significance Threshold</i>	54	54	82	54
Do the Worst-Case Day Emissions Exceed Thresholds?	No	No	No	No

a Emissions were modeled using URBEMIS 2007. It was assumed that 65.8 acres of open space, 179,500 square feet of R & D uses, and 3.1 acres of roadway would be developed during the years 2017 through 2020. Additional information is included in Appendix AIR.
b **Bold** values denote emissions that exceed the applicable threshold.

The BAAQMD *CEQA Guidelines* have an established threshold of 10 in 1,000,000 persons affected by carcinogenic health risks. An HRA prepared for the Redevelopment Project EIR found construction would have potentially significant impacts with regard to TACs and DPM. The Redevelopment Project EIR therefore identified, and the City and Redevelopment Agency adopted, **Mitigation Measure AQ-2.1**, which requires the reduction of DPM emissions during construction through emission control technology for particulate matter. This measure will require that 50% of the construction fleet meet U.S. Environmental Protection Agency Tier 2 standards outfitted with California Air Resources Board Level 3 Verified Diesel Emission Control Strategies for particulate matter control (or equivalent) during 2010 and 2011 construction activities, with requirements increasing to 75% of the fleet in 2012, and 100% of the fleet in 2013 and for construction duration. With the application of this mitigation to the R&D variant project, construction activities will have less than significant impacts related to air emissions of TACs.

Operations

As shown in **Table 3.2-6**, operation of the uses developed on the subject land under the R&D variant project would generate emissions of criteria pollutants that would be less than the respective General Conformity Rule or BAAQMD significance thresholds. Thus, the R&D variant project would result in a less than significant impact related to long-term operational emissions of criteria pollutants.

**TABLE 3.2-6
ESTIMATED ANNUAL OPERATION EMISSIONS^{A,B}**

Emission Source	Criteria Pollutant Emissions (tons/year)			
	ROG	NOx	PM10	PM2.5
Area	<1	<1	0	0
Vehicle	1	1	2	<1
Total	1	1	2	<1
<i>General Conformity Significance Threshold</i>	100	100	<i>NA</i>	100
Exceed Thresholds?	No	No	No	No
<i>BAAQMD Significance Threshold</i>	10	10	15	10
Exceed Thresholds?	No	No	No	No

a Operational emissions were modeled using URBEMIS 2007 for the assumed 65.8 acres of open space and parks and 179,500 square feet of R&D uses. Additional information is included in Appendix AIR.
b **Bold** values denote emissions that exceed the applicable threshold.

The Redevelopment Project EIR included CALINE4 modeling of localized CO emissions. The analysis showed that CO concentrations would not exceed the state or federal standards. As the proposed amendment and subsequent development would result in a small percentage of the vehicle trips generated by the Redevelopment Project as a whole, the CO emissions and concentration levels attributable to the development of the project site would also be less than significant.

The BAAQMD gives examples of land uses that have potential to generate considerable odors, including wastewater treatment plants, landfills, oil refineries, and chemical plants. The R&D variant project would not result in sources of substantial odor. This would be a less than significant impact.

Development of the R&D variant project is a part of the overall Redevelopment Project, in which the Redevelopment Project EIR determined would conform to the current regional air quality plan. The R&D variant project would therefore conform as well and would have a less than significant effect on the current regional air quality plan.

Cumulative

Construction emissions are evaluated above in **Tables 3.2-4 and 3.2-5** and do not exceed General Conformity or BAAQMD thresholds of significance. Therefore cumulative construction criteria air pollutant impacts would be less than significant. The cumulative projects are residential and commercial uses which are not anticipated to be a new permitted toxic or particulate matter source. Furthermore, the project site is located over 1,000 feet from a freeway, which is the BAAQMD screening distance for estimating risk and hazard impacts from California highways and high volume arterial roadways in the Bay Area.

In regard to operations, as shown in **Table 3.2-6** above, the R&D variant project would not exceed General Conformity or BAAQMD thresholds for criteria air pollutants, nor would the R&D variant project site new permitted toxic or particulate matter sources. Based on the analysis above, the construction and operational emissions related to development of the R&D variant project would not contribute considerably to a cumulative air quality impact.

Housing Variant Scenario

Construction

Criteria pollutant construction emissions for the uses to be developed on the lands subject to the proposed amendment under the housing variant project were calculated and are depicted below in **Table 3.2-7** (Annual Emissions) and **Table 3.2-8** (Daily Emissions). As shown in these tables, proposed construction would generate unmitigated emissions of criteria pollutants that would be less than the respective General Conformity Rule and BAAQMD significance thresholds and would therefore have a less than significant impact related to construction emissions of criteria pollutants. Further, the Redevelopment Project EIR identified, and the City and Redevelopment Agency adopted, **Mitigation Measure HZ-15**, which requires fugitive dust control to meet BAAQMD requirements.

**TABLE 3.2-7
ESTIMATED ANNUAL UNMITIGATED CONSTRUCTION EMISSIONS^{A,B}**

Construction Phase	Criteria Pollutant Emissions (tons per year)			
	ROG	NOx	PM10	PM2.5
2017	1	3	48	10
2018	1	3	22	5
2019	1	2	<1	<1
2020	3	2	<1	<1
<i>General Conformity Significance Threshold</i>	<i>100</i>	<i>100</i>	<i>NA</i>	<i>100</i>
Does the Worst-Case Emission Exceed Thresholds?	No	No	No	No

a Emissions were modeled using URBEMIS 2007. It was assumed that 66.2 acres of open space, 176 dwelling units, and 3.7 acres of roadway would be developed during the years 2017 through 2020. Additional information is included in Appendix AIR.

b **Bold** values denote emissions that exceed the applicable threshold.

**TABLE 3.2-8
ESTIMATED DAILY UNMITIGATED CONSTRUCTION EMISSIONS**

Construction Phase	Unmitigated Criteria Pollutant Emissions (pounds per day)			
	ROG	NOx	PM10 (Exhaust)	PM2.5 (Exhaust)
2017	4	26	1	1
2018	5	34	2	2
2019	4	16	1	1
2020	21	15	1	1
<i>BAAQMD Significance Threshold</i>	<i>54</i>	<i>54</i>	<i>82</i>	<i>54</i>
Does the Worst-Case Emission Exceed Thresholds?	No	No	No	No

a Emissions were modeled using URBEMIS 2007. It was assumed that 66.2 acres of open space, 176 dwelling units, and 3.7 acres of roadway would be developed during the years 2017 through 2020. Additional information is included in Appendix AIR.

b **Bold** values denote emissions that exceed the applicable threshold.

The BAAQMD *CEQA Guidelines* have an established threshold of 10 in 1,000,000 for carcinogenic health risks. An HRA prepared for the Redevelopment Project EIR found construction would have potentially significant impacts with regard to TACs and DPM. The Redevelopment Project EIR therefore identified, and the City and Redevelopment Agency adopted, **Mitigation Measure AQ-2.1**, which requires the reduction of DPM emissions during construction through emission control technology for particulate matter. This measure will require that 50% of the construction fleet meet U.S. Environmental Protection Agency Tier 2 standards outfitted with California Air Resources Board Level 3 Verified Diesel Emission Control Strategies for particulate matter control (or equivalent) during 2010 and 2011 construction activities, with requirements increasing to 75% of the fleet in 2012, and 100% of the fleet in 2013 and for construction duration. With the application of this mitigation to the housing variant project, construction activities will have less than significant impacts related to air emissions of TACs.

Operations

As shown in **Table 3.2-9**, operation of open space and housing on the subject lands under the housing variant project would generate emissions of criteria pollutants that would be less than the respective General Conformity

Rule or BAAQMD significance thresholds. Thus, the housing variant project would result in a less than significant impact related to long-term operational emissions of criteria pollutants.

**TABLE 3.2-9
ESTIMATED ANNUAL OPERATION EMISSIONS^{A,B}**

Emission Source	Criteria Pollutant Emissions (tons/year)			
	ROG	NOx	PM10	PM2.5
Area	3	<1	<1	1
Vehicle	1	1	2	<1
Total	4	1	2	1
<i>General Conformity Significance Threshold</i>	<i>100</i>	<i>100</i>	<i>NA</i>	<i>100</i>
Exceed Thresholds?	No	No	No	No
<i>BAAQMD Significance Threshold</i>	<i>10</i>	<i>10</i>	<i>15</i>	<i>10</i>
Exceed Thresholds?	No	No	No	No

a Operational emissions were modeled using URBEMIS 2007 for the assumed 66.2 acres of open space and parks , 176 dwelling units and roadways. Additional information is included in Appendix AIR.
b **Bold** values denote emissions that exceed the applicable threshold.

The Redevelopment Project EIR included CALINE4 modeling of localized CO emissions. The analysis showed that CO concentrations would not exceed the state or federal standards. As the proposed conversion would result in a small percentage of the vehicle trips generated by the Redevelopment Project as a whole, the CO emissions and concentration levels attributable to the development of the project site would also be less than significant.

The BAAQMD gives examples of land uses that have potential to generate considerable odors, including wastewater treatment plants, landfills, oil refineries, and chemical plants. The housing variant project would not result in sources of substantial odor. This would be a less than significant impact.

Development of the housing variant project is a part of the overall Redevelopment Project, in which the Redevelopment Project EIR determined would conform to the current regional air quality plan. The housing variant project would therefore conform as well and would have a less than significant effect on the current regional air quality plan.

Cumulative

Construction emissions are evaluated above in **Tables 3.2-7 and 3.2-8** and do not exceed General Conformity or BAAQMD thresholds of significance. Therefore cumulative construction criteria air pollutant impacts would be less than significant. The cumulative projects are residential and commercial uses which are not anticipated to be a new permitted toxic or particulate matter source. Furthermore, the project site is located over 1,000 feet from a freeway, which is the BAAQMD screening distance for estimating risk and hazard impacts from California highways and high volume arterial roadways in the Bay Area.

In regards to operations, as shown in **Table 3.2-9** above, the housing variant project would not exceed General Conformity or BAAQMD thresholds for criteria air pollutants, nor would the housing variant project site new permitted toxic or particulate matter sources. Based on the analysis above, the construction and operational emissions related to development of the housing variant project would not contribute considerably to a cumulative air quality impact.

3.3 Greenhouse Gas

Greenhouse Gas (GHG) Thresholds for All Scenarios

BAAQMD considers GHG impacts to be exclusively cumulative impacts (as does the California Air Pollution Controls Officer Association) and, as such, assessment of significance is based on a determination of whether the GHG emissions from a project represent a cumulatively considerable contribution to the global atmosphere. This analysis uses BAAQMD thresholds to determine the significance of impacts. The BAAQMD adopted new thresholds of significance in June 2010, which are included in the updated *CEQA Air Quality Guidelines* (BAAQMD, 2011). The BAAQMD has not established GHG thresholds associated with construction activities; the BAAQMD GHG thresholds associated with long-term operations are listed below:

- For land use development projects, the threshold is compliance with a qualified GHG Reduction Strategy; **or** annual emissions less than 1,100 metric tons per year of CO₂e; **or** 4.6 metric tons CO₂e/service population/year (residents + employees). Land use development projects include residential, commercial, industrial, and public land uses and facilities.

GHG emissions resulting from the project scenarios were estimated using a combination of URBEMIS 2007 model and the Bay Area Greenhouse Gas Model (BGM) of the BAAQMD. GHG emissions from motor vehicle sources were calculated using the URBEMIS 2007 model in conjunction with the BGM. Area and indirect sources associated with the project scenarios would primarily result from electrical usage, water and wastewater transport (the energy used to pump water and wastewater to and from the project scenarios) and solid waste generation. GHG emissions from electrical usage are generated when energy consumed on the site is generated by fuel combustion. GHG emissions from water and wastewater transport are also indirect emissions resulting from the energy required to transport water from its source, and the energy required to treat wastewater and transport it to its treated discharge point. Solid waste emissions are generated when the increased waste generated by the project scenarios are taken to a landfill to decompose. GHG emissions from electrical usage, water and wastewater conveyance, and solid waste were estimated using the BGM. Results of the analysis are described below for each scenario.

Project Scenario

Due to the lack of residences as well as significant direct employment opportunities under the project scenario, this analysis will use the 1,100 metric tons CO₂e/year threshold to determine impact significance. **Table 3.3-1** shows quantified GHG emissions by source and compares emissions to the applied threshold.

**TABLE 3.3-1
EMISSIONS OF GHG FROM THE PROJECT SCENARIO^A**

Emission Source/Sink	Emissions (metric tons CO ₂ e per year)
	Total CO ₂ e
Motor vehicle trips	98
Natural gas	0
Grid Electricity	0
Solid Waste	0
Water and Wastewater Conveyance and Treatment	66
Area Source (landscape maintenance)	<1
Total Operational Greenhouse Gas Emissions	164
BAAQMD Threshold (Tons/ Year)	1,100
Exceed the BAAQMD Threshold (Yes or No)?	No

^a GHG emissions were modeled with URBEMIS 2007 and the BGM. Model outputs and additional information are included in Appendix AIR.

Construction emissions for the worst-case year of project scenario development would be 500 metric tons per year. However, as previously discussed, the BAAQMD Guidelines do not include a specific threshold or methodology for assessing construction-related GHG emissions for CEQA analysis. For operations, as shown in **Table 3.3-1** above, the total annual GHG emissions generated by the project scenario would be approximately 164 metric tons CO₂e per year. Based on the BAAQMD significance threshold, the project scenario would not have a significant impact because it would not exceed 1,100 metric tons of CO₂e annually.

Development of the project scenario is a part of the overall Candlestick Point-Hunters Point Shipyard Redevelopment Plan, which the Redevelopment Project EIR determined would not conflict with the state’s goals of reducing GHG emissions to 1990 levels by 2020, or the City’s GHG reduction goals established in the Greenhouse Gas Reduction Ordinance, and would not result in a significant cumulative impact. Thus, the project scenario would also not conflict with any applicable plan, policy or regulation adopted with the intent to reduce GHG emissions because, as described above, it would not result in a significant impact based on numeric thresholds and because future development will align with existing current plans, policies and regulations adopted to reduce GHG emissions.

R & D Variant Scenario

This analysis will use the 4.6 metric tons CO₂e/service population/year threshold to determine impact significance. **Table 3.3-2** shows quantified GHG emissions by source and compares emissions to the service population threshold.

**TABLE 3.3-2
EMISSIONS OF GHG FROM THE R&D VARIANT PROJECT^A**

Emission Source/Sink	Emissions (metric tons CO ₂ e per year)
	Total CO ₂ e
Motor vehicle trips	784
Natural gas	41
Grid Electricity	506
Solid Waste	127
Water and Wastewater Conveyance and Treatment	65
Area Source (landscape maintenance)	<1
Total Operational Greenhouse Gas Emissions	1,523
Tons/Service Population/Year (residents + employees)^B	3.4
BAAQMD Threshold (Tons/Service Population/Year)	4.6
Exceed the BAAQMD Threshold (Yes or No)?	No

a GHG emissions were modeled with URBEMIS 2007 and the BGM. Model outputs and additional information are included in Appendix AIR.

b The service population for the R&D variant project was estimated to be 451 employees, based on the proposed 179,500 square feet of R&D uses and an estimated 400 square feet per job (per the Redevelopment Project EIR), as well as 2 full time employees supporting the park and open space uses. There are no residences associated with this scenario.

Construction emissions for the worst-case year of R&D variant project development would be 2,200 metric tons per year. However, as previously discussed, the BAAQMD Guidelines do not include a specific threshold or methodology for assessing construction-related GHG emissions for CEQA analysis. For operations, as shown in **Table 3.3-2** above, the total annual GHG emissions generated by the R&D variant project would be

approximately 1,523 metric tons CO₂e per year. Total emissions and service population (employees only for this scenario) generated by the R&D variant project would result in approximately 3.4 metric tons CO₂e per service population annually. Based on the BAAQMD significance threshold, the R&D variant project would not have a significant impact because it would not exceed 4.6 metric tons of CO₂e per service population annually.

Development of the R&D variant project is a part of the overall Candlestick Point-Hunters Point Shipyard Redevelopment Plan, which the Redevelopment Project EIR determined would not conflict with the state’s goals of reducing GHG emissions to 1990 levels by 2020, or the City’s GHG reduction goals established in the Greenhouse Gas Reduction Ordinance, and would not result in a significant cumulative impact. Thus, the R&D variant project would also not conflict with any applicable plan, policy or regulation adopted with the intent to reduce GHG emissions because, as described above, it would not result in a significant impact based on numeric thresholds and because future development will align with existing current plans, policies and regulations adopted to reduce GHG emissions.

Housing Variant Scenario

This analysis will use the 4.6 metric tons CO₂e/service population/year threshold to determine impact significance. **Table 3.3-3** shows quantified GHG emissions by source and compares emissions to the service population threshold.

**TABLE 3.3-3
EMISSIONS OF GHG FROM THE HOUSING VARIANT PROJECT^A**

Emission Source/Sink	Emissions (metric tons CO ₂ e per year)
	Total CO ₂ e
Motor vehicle trips	676
Natural gas	210
Grid Electricity	237
Solid Waste	133
Water and Wastewater Conveyance and Treatment	79
Area Source (landscape maintenance)	92
Total Operational Greenhouse Gas Emissions	1,427
Tons/Service Population/Year (residents + employees)^B	3.5
BAAQMD Threshold (Tons/Service Population/Year)	4.6
Exceed the BAAQMD Threshold (Yes or No)?	No

a GHG emissions were modeled with URBEMIS 2007 and the BGM. Model outputs and additional information are included in Appendix AIR.

b The service population for the housing variant project was estimated to be 412 persons, based on the proposed 176 dwelling units and a population of 2.33 persons per dwelling unit (per the Redevelopment Project EIR), as well as 2 full time employees supporting the park and open space uses.

Construction emissions for the worse-case year of housing variant project development would be 1,966 metric tons per year. However, as previously discussed, the BAAQMD Guidelines do not include a specific threshold or methodology for assessing construction-related GHG emissions for CEQA analysis. For operations, as shown in **Table 3.3-3** above, the total annual GHG emissions generated by the housing variant project would be approximately 1,427 metric tons CO₂e per year. Total emissions and service population (residents only for this

scenario) generated by the housing variant project would result in approximately 3.5 metric tons CO₂e per service population annually. Based on the BAAQMD significance threshold, the housing variant project would not have a significant impact because it would not exceed 4.6 metric tons of CO₂e per service population annually.

Development of the housing variant project is a part of the overall Candlestick Point-Hunters Point Shipyard Redevelopment Plan, which the Redevelopment Project EIR determined would not conflict with the state's goals of reducing GHG emissions to 1990 levels by 2020, or the City's GHG reduction goals established in the Greenhouse Gas Reduction Ordinance, and would not result in a significant cumulative impact. Thus, the housing variant project would also not conflict with any applicable plan, policy or regulation adopted with the intent to reduce GHG emissions because, as described above, it would not result in a significant impact based on numeric thresholds and because future development will align with existing current plans, policies and regulations adopted to reduce GHG emissions.

4.0 Preparers

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