4.E Air Quality

The comments and corresponding responses in this section cover topics in Draft SEIR Section 3.D, Air Quality. The comments are further grouped according to the following air quality issues that the comments raise:

- Comment AQ-1: Sensitive Receptors
- Comment AQ-2: Construction Schedule
- Comment AQ-3: Mitigation Measure

Comment AQ-1: Sensitive Receptors

This response addresses comments from the commenter listed below; each comment on this topic is quoted in full below this list:

O-CURRIER-1
I-HANSON3-1
I-HEGGIE2-19
I-MARABELLO1-1

"Good afternoon. That's a tough one to follow, but I've got a few concerns. My name's Dr. Andrew Currier. I'm representing Archbishop Riordan High School, as its President.

There's a multitude of concerns. But as it relates to this report, we serve 680 boys, 9 to 12, and a quarter of them, 170 of them, have diagnosed learning needs. And if you see, if I could pull this up, this circle RSP; that represents the learning area. It's a specialized designed learning area for students with diagnosed learning needs that they can't -- we can't move them elsewhere in the building.

So, we're worried that there's not enough information about the noise, the dust, the disruption to their learning growth, their academic growth. Again, we don't have any option to move them elsewhere in the building, so we really want more detail on that. We want some sensitivity to that. These are young men that cannot be served by San Francisco public schools. These are specialized programs.

We also have 50 students in residence at Archbishop Riordan High School who, also, some of them have significant learning needs. They can't go elsewhere to receive this help."

*(Andrew Currier, PhD, President, Archbishop Riordan High School, CPC Hearing, September 12, 2019 [*O-CURRIER-1*])*

"The Draft SEIR discusses risks in the APEZ, which is the Air Pollutant Exposure Zone. The risk is highest for children, referred to as "sensitive receptors," at Childcare Centers, and the SEIR identifies Childcare Centers in the area and their distance to the construction zone. The Childcare Center at City College, located in the bungalows is identified and though it is not the closest in

proximity it is the only center noted that lies within the APEZ, sits to the East and is in the prevailing path of the wind.

The draft SEIR fails to note the Childcare classes that are centered in the City College Multi-Use Building (MUB), which teaches classes with children on site. Though these children are not playing outside of the building, the MUB sits approximately 150 feet away from the proposed development (per figure 2-3) is to the East of the construction site, and downwind.

Because of the proximity of the MUB to the construction site, its location is comparable to the planned childcare site within the proposed construction area. The SEIR classifies the danger to those children for future health impacts as being significant but says that because the development's future daycare centers won't be up and running during construction this isn't likely to be an issue as follows:

From the draft SEIR page 3.D-71: 'in the unlikely event that the daycare would be completed in Phase 1 and be operational during Phase 2 construction, the potential for future health risk impacts from exposure of daycare receptors to Phase 2 construction TAC emissions would be potentially significant, especially given the potential that the project could be developed under an accelerated construction schedule of as little as three years' duration, increasing the DPM exposure of daycare receptors.'

The proposed project must study the potential danger to the children who participate in the classes in City College's MUB. The data shows that they are not included in this study. Because the draft SEIR identifies significant health impacts for children at the future daycare centers located within the construction area, those concerns must be addressed as well with the children in the MUB whose proximity and direction of location put them at similar risk. These children in the MUB are within the APEZ and the building they are in is to the East, and downwind of the proposed project. The danger to these children is also increased with the potential for an accelerated construction schedule for both alternatives, **after studying the impacts**; the SEIR must offer mitigations for these children for all of the alternatives studied in the draft SEIR."

*(Christine Hanson, Email, September 11, 2019 [*I-HANSON3-1])

"Please include the sensitive receptors identified above for noise in assessments of air quality as appropriate, although air travels farther than noise."

*(Jennifer Heggie, Email, September 23, 2019 [*I-HEGGIE2-19*])*

"FAILURE TO INCLUDE A SIGNIFICANT SENSITIVE RECEPTOR — STUDENT-ATHLETES

1. Both the PEIR (page 251) and BAAQMD guidelines (http://www.spareheair.org/understanding-air-quality/air-pollutants-and-healtheffects/whos-at-risk) include persons engaged in strenuous exercise as sensitive receptors.

The SEIR does not do so similarly for a sizable group that exercises routinely and strenuously adjacent to the project area — CCSF athletes. It does not designate them, many of whom train and compete outdoors within 1/4 mile of the BR, as sensitive receptors. It fails to mention this significant group altogether. Thus they were not included in any of the analyses, including the Health Risk Assessment.

This is a violation of San Francisco Administrative Code chapter 31.

There are hundreds of CCSF student-athletes exercising strenuously, outdoors and indoors, who need to be factored in to required air quality analyses.

Plus there are many more who are strenuously exercising in CCSF Ocean Campus physical eduction courses that should be accounted for.

Also, if health risk assumptions used in the SEIR's air quality analyses are different for athletes than they are for students, and they probably are, then the athletes among the student body at Archbishop Riordan should be their own receptor type in the analyses."

*(Brian Marabello, Email, September 23, 2019 [*I-MARABELLO1-1*])*

Response AQ-1: Sensitive Receptors and Construction

The comments relate to concerns about construction-related air quality impacts. Specifically, the comments state that the SEIR analysis should analyze potential health risk impacts to the children who attend the childcare classes in City College's Multi-Use Building. Other comments request that additional sensitive receptor locations and types of sensitive receptors be included in the air quality analysis. These topics are addressed under the appropriate subheadings below.

City College Multi-Use Building Occupants as Sensitive Receptors and Additional Sensitive Receptors

This commenter states that the air quality analysis should have included children potentially present at childcare classes at the City College Multi-Use Building as sensitive receptors in the health risk assessment (HRA). The commenter claims that due to the Multi-Use Building's proximity to the site, its location in the APEZ, and because the SEIR finds a significant impact for new onsite daycare receptors which would be comparable to the Multi-Use Building receptors, receptors at the Multi-Use Building should be evaluated in the SEIR. Another comment requested that additional sensitive receptor locations be included in the air quality analysis. The additional locations requested include the corner of Judson Street and Frida Khalo Way where the future City College replacement childcare center is planned, and the Mighty Bambini childcare/nursery school at the corner of Staples and Frida Kahlo Way.

The potential presence of children in a given land use does not necessarily indicate that such a land use is a sensitive receptor for TAC emissions. Locations where a land uses is designed for children to receive instruction on a regular basis (i.e., are enrolled) such as an elementary or pre-school are considered to be sensitive receptors, and are analyzed as such in the SEIR. The City and County of

San Francisco does not consider adult education facilities, such as City College, to be sensitive receptors with the exception of dedicated child care facilities that may be present on such uses.

The commenter is incorrect that the Multi-Use Building is in the APEZ. As noted on page 3.D-66 of the SEIR, the only APEZ locations in the study area (1,000-meter radius of the proposed project boundary) are receptor locations within 500 feet of I-280. The Multi-Use Building is located beyond 500 feet from I-28 and therefore is not located in the APEZ.[1] In addition, the commenter is incorrect that the Childcare Center in the bungalows at City College is in the APEZ; no daycare evaluated in the SEIR is located within the APEZ. As stated on SEIR page 3.D-75, the tables that present risk results for receptors located in the APEZ, "do not show receptors types that are not already in the APEZ, including onsite residents, offsite daycare, and onsite daycare; risks to these receptors are discussed above."

The commenter states that child attendees at the Multi-Use Building childcare classes would be present long enough in the building to be exposed to significant TAC emissions from project construction and operation. The planning department followed up with City College regarding these classes.[2] Based on information from City College, these classes are child behavior observation classes. The classes at the Multi-Use Building are three hours in duration and are offered daily. However, parents may opt to bring their child once a week, or up to five times a week. Thus, the presence of children at the Multi-Use Building would not occur for extended periods of time (i.e., 8 hours per day, 7 days per week, as do typical daycare and school receptors). Even if the children attended these classes five days a week, their time spent in the Multi-Use Building (e.g., 15 hours per week) would be much less than the time children would spend at the daycare locations evaluated in the SEIR (e.g., 56 hours per week). This means that the exposure for potential children who participate in the classes at the Multi-Use Building would be much lower than the exposure estimated for the daycare, school, and residential receptors included in the SEIR. For daycares, the SEIR assumed exposure to project-generated TACs would occur 8 hours per day, 7 days per week (250 days per year). For schools, the SEIR assumed 8 hours per day, 5 days per week (180 days per year). For residents, the SEIR assumed 24 hours per day, 7 days per week (350 days per year).[3] Potential children who participate in the classes at the Multi-Use Building would be expected to be exposed to project-generated TACs a maximum of 3 hours per day, 5 days per week (180 days per year). This is 73 percent less than the exposure currently modeled for daycare receptors, 63 percent less than the exposure currently modeled for school receptors, and 94 percent less than the exposure currently modeled for residential receptors. Therefore, the exposure for potential Multi-Use Building children receptors would be substantially lower than what was modeled in the SEIR for receptors located at a similar distance from the proposed project's boundaries.

It should also be noted that the Multi-Use Building is approximately 175 feet from the project site boundary, not 150 feet as the commenter claims. This places the Multi-Use Building daycare receptor further from the proposed project site than four daycare locations evaluated in the SEIR.

---

1 San Francisco Department of Public Health and San Francisco Planning Department, *Air Pollutant Exposure Zone Map – Citywide*, April 2014, *https://www.sfdph.org/dph/files/EHSdocs/AirQuality/AirPollutantExposureZoneMap.pdf*, accessed November 2019.

2 Rosario Villasana, Department Chair of Child Development and Family Studies, City College. Phone correspondence with Jeanie Poling, San Francisco Environmental Planning, on October 1, 2019.

3 See Appendix E of the SEIR, *Air Quality Technical Memorandum*, Table 10, page 21-23.

The HRA modeled 16 offsite daycare sensitive receptor locations, four of which are located within 160 feet of the project site, including Shining Stars Family Child Center, Harmony Family Childcare, Blooming Child Care, and Cel Coalition Center (see SEIR Appendix E, *Air Quality Technical Memorandum*, Table 9, p. 20). None of these locations or the Multi-Use Building are in the APEZ. As described on SEIR p. 3.D-66, a project would result in significant health risk impact if a receptor point meets the APEZ criteria[4] that otherwise would not meet the criteria without the project, and if the project would contribute to $PM_{2.5}$ concentrations at or above 0.3 $\mu g/m^3$ or result in an excess cancer risk at or greater than 10.0 per one million persons exposed.

However, in an effort to disclose potential health risk impacts for a potential child attendee at the Multi-Use Building, maximum mitigated lifetime excess cancer risk and annual average $PM_{2.5}$ concentrations were estimated for this potential child attendee. The results of this analysis are presented in **Table RTC-1, Mitigated Lifetime Excess Cancer Risk for the Multi-Use Building Child Attendee and Select Daycare, School, and Residential Sensitive Receptors for the Additional Housing Option**, and **Table RTC-2, Mitigated Annual Average PM2.5 for the Multi-Use Building Child Attendee and Select Daycare, School, and Residential Sensitive Receptors for the Additional Housing Option**. For comparative purposes, the lifetime excess cancer risk at similar nearby sensitive receptor locations, as analyzed in the SEIR, are also presented in the table below. Results are presented for the Additional Housing Option because TAC emissions and health risks are greater for the Additional Housing Option than for the Developer's Proposed Option.

TABLE RTC-1
MITIGATED LIFETIME EXCESS CANCER RISK FOR THE MULTI-USE BUILDING CHILD ATTENDEE AND SELECT DAYCARE, SCHOOL, AND RESIDENTIAL SENSITIVE RECEPTORS FOR THE ADDITIONAL HOUSING OPTION

Receptor	Location Relative to the Proposed Project	Mitigated Lifetime Excess Cancer Risk for the Additional Housing Option (in One Million) [a,b]			SEIR Table Source
		Project	Background	Total	
Multi-Use Building child attendee	140 feet east [c]	4.9	26.6	31.5	n/a
Archbishop Riordan High School	30 feet north	1.9	17.5	19.4	3.D-13b
Shining Stars Family Child Center	30 feet west	12.8	21.9	34.7	3.D-13b
Harmony Family Childcare	50 feet southeast	4.2	41.3	45.5	n/a
Mighty Bambinis Childcare & Preschool	750 feet northeast	1.0	19.5	20.5	n/a
Residential	directly west/south	9.5	16.9	26.4	3.D-13b

NOTES:

SEIR = Subsequent Environmental Impact Report; n/a = not applicable (not presented in the SEIR tables).

[a] Cancer risks are presented for the construction plus operational emissions scenario (Scenario 3), as this exposure scenario results in the highest risks. These values are all for receptors not located in the APEZ.

[b] Mitigation measures include: (1) M-AQ-2a: all off-road construction equipment was modeled with Tier 4 Final engine emission standards; and (2) M-AQ-4a: all emergency generators were modeled with Tier 4 engine emission standards.

[c] Although the westernmost façade of the MUB building is approximately 175 feet from the Proposed Project boundary, the receptor grid was extended slightly westward as a conservative analysis.

Source: ESA 2019

[4] The APEZ criteria for this location is based on: (1) cumulative $PM_{2.5}$ concentrations greater than 10 $\mu g/m^3$, and/or (2) excess cancer risk from the contribution of emissions from all modeled sources greater than 100 per one million population. See SEIR page 3.D-39 to 3.D-40 for more detail.

TABLE RTC-2
MITIGATED ANNUAL AVERAGE PM2.5 FOR THE MULTI-USE BUILDING CHILD ATTENDEE AND SELECT DAYCARE, SCHOOL, AND RESIDENTIAL SENSITIVE RECEPTORS FOR THE ADDITIONAL HOUSING OPTION

Receptor	Location Relative to the Proposed Project	Mitigated Annual Average PM2.5 Concentration for the Additional Housing Option (µg/m³) [a,b]			HRA Table Source
		Project	Background	Total	
Multi-Use Building child attendee	140 feet east [c]	0.07	8.47	8.54	n/a
Archbishop Riordan High School	30 feet north	0.03	8.34	8.37	30
Shining Stars Family Child Center	30 feet west	0.04	8.49	8.53	30
Harmony Family Childcare	50 feet southeast	0.02	8.75	8.77	n/a
Mighty Bambinis Childcare & Preschool	750 feet northeast	0.00	8.30	8.31	n/a
Residential	directly west/south	0.06	8.57	8.64	30

NOTES:

$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; µg/m³ = micrograms per cubic meter; HRA = health risk assessment; n/a = not applicable (not presented in the HRA tables).

[a] $PM_{2.5}$ concentrations are presented for the construction plus operational emissions scenario (Scenario 3), as this exposure scenario results in the highest annual average $PM_{2.5}$ concentrations. These values are all for receptors not located in the APEZ.

[b] Mitigation measures include: (1) M-AQ-2a: all off-road construction equipment was modeled with Tier 4 Final engine emission standards; and (2) M-AQ-4a: all emergency generators were modeled with Tier 4 engine emission standards.

[c] Although the westernmost façade of the MUB building is approximately 175 feet from the Proposed Project boundary, the receptor grid was extended slightly westward as a conservative analysis.

Source: ESA 2019

As shown in Table RTC-1, the maximum mitigated lifetime excess cancer risk at the Multi-Use Building child attendee receptor location is 4.9 per million from the project. When combined with the background risk of 26.6 per million, the cumulative total mitigated risk is 31.5 per million. Because the cumulative total is less than the APEZ criteria of 100 per million, the Multi-Use Building child attendee receptor is not placed into the APEZ with the project's contribution. Also shown in Table RTC-1, none of the nearby receptors analyzed in the SEIR is placed into the APEZ with the project's contribution, nor is the cumulative total risk for any of these receptors near the APEZ criteria of 100 per million.

As shown in Table RTC-2, the maximum mitigated annual average $PM_{2.5}$ concentration at the Multi-Use Building child attendee receptor location is 0.07 µg/m³ from the project. When combined with the background annual average $PM_{2.5}$ concentration of 8.47 µg/m³, the cumulative total maximum mitigated annual average $PM_{2.5}$ concentration is 8.54 µg/m³. Because the total is less than the APEZ criteria of 10.0 µg/m³, the Multi-Use Building child attendee receptor is not placed into the APEZ with the project's contribution. Also shown in Table RTC-2, none of the nearby receptors analyzed in the SEIR is placed into the APEZ with the project's contribution, nor is the cumulative total risk for any of these receptors near the APEZ criteria of 10.0 µg/m³.

The commenter states that the SEIR finds significant health impacts for new onsite daycare receptors, and because the Multi-Use Building receptors are similar to these onsite receptors, the SEIR must study the Multi-Use Building. The SEIR concluded on page 3.D-72 that without mitigation, "the impact with regard to increased cancer risk would be significant for onsite receptors not located in the APEZ," which includes the new onsite daycare receptors. To address

this impact, the SEIR identifies Mitigation Measures M-AQ-4a (Diesel Backup Generator Specifications), and M-AQ-4b (Install MERV 13 Filters at the Daycare Facility), which would "reduce impacts related to TAC emissions at the daycare facility to a less-than-significant level" (SEIR p. 3.D-73). In addition, Mitigation Measure M-AQ-2a (Construction Emissions Minimization) would reduce TAC emissions from construction and therefore also the impact on these receptors. The SEIR concludes on p. 3.D-74, "Even with worst-case construction phasing assumptions for the onsite daycare receptor… health risks to onsite daycare sensitive receptors would be less than significant." As such, the impact on new daycare receptors sited by the project would be less than significant, contrary to the commenter's claim that the SEIR identifies significant health impacts for these receptors. Mitigation Measures M-AQ-2a and M-AQ-4a would also reduce TAC exposure at the Multi-Use Building receptor location.

The SEIR concluded that all impacts for sensitive receptors not located in the APEZ, including impacts under the compressed three-year construction schedule, would be less than significant (see SEIR pp. 3.D-71 to 3.D-72 for cancer risk impacts and 3.D-78 to 3.D-79 for PM2.5 impacts). The SEIR concluded that impacts would be significant and unavoidable *only for those sensitive receptors already located in the APEZ* (i.e., those located within 500 feet of I-280) under the compressed three-year construction schedule. As stated on SEIR p. 3.D-80 of the SEIR, "the health risks to existing offsite sensitive receptors [located in the APEZ] may exceed the cancer risk thresholds under the worst-case three-year construction phasing scenario, as presented in SEIR Table 3.D-12a and Table 3.D-11b; therefore, this impact would be significant and unavoidable with mitigation." Since the SEIR concluded that health risks at all sensitive receptor locations not in the APEZ would be less than significant, the impact at the Multi-Use Building receptor would therefore also be less than significant.

The commenter also requested that the air quality analysis include additional sensitive receptor locations, including where the future City College replacement childcare center is planned at the corner of Judson Street and Frida Khalo Way and the Mighty Bambini childcare/nursery school at the corner of Staples and Frida Kahlo Way. With regard to the future City College replacement childcare, the HRA included this location as a residential sensitive receptor in the analysis. In addition, the HRA included daycare receptors at Little Lemon nursery school, which is located 200 feet west of the corner of Judson Street and Frida Khalo Way, at the corner of Judson Street and Gennessee Street. The maximum lifetime excess residential cancer risk at the corner of Judson Street and Frida Khalo Way was estimated to be 1.1 per million from the project and the maximum lifetime excess school cancer risk at the Little Lemon nursery school was estimated to be 0.35 per million from the project. Therefore, the daycare risk at the corner of Judson Street and Frida Khalo Way for the future City College replacement childcare would be equal to or lower than these values. In addition, it is speculative to assume the future location of the City College replacement childcare would be at the corner of Judson Street and Frida Khalo Way, and CEQA does not require speculation. With regard to the Mighty Bambini childcare/nursery school at the corner of Staples and Frida Kahlo Way, the HRA does already include this as a sensitive receptor; see Appendix E, *Air Quality Technical Memorandum*, Table 9, page 20. Also see Table RTC-1 and Table RTC-2, above. Therefore, additional analysis at these potential receptor locations is not warranted.

In summary, the SEIR adequately evaluates all sensitive receptor locations within 1,000 meters of the project site. The Multi-Use Building, if treated as a sensitive receptor, would have much lower

exposure to project-generated TAC emissions and a lower health risk than the nearby daycare receptors evaluated in the SEIR, as presented in Table RTC-1 and Table RTC-2. The Multi-Use Building is not located in the APEZ and is therefore not comparable to the impacts determined in the SEIR for receptors located in the APEZ. In addition, the Multi-Use Building is located farther away from the project boundary than a number of daycare receptors included in the SIER, including new onsite daycare receptors, and the SEIR determined a less-than-significant impact for all of these sensitive receptors. The SEIR adequately analyzes impacts on all nearby sensitive receptors for the proposed project and alternatives and includes all feasible mitigation measures to address these impacts. No additional analysis or mitigation measures are necessary.

Student Athletes as Sensitive Receptors

A commenter states that the air quality analysis should have included student athletes at City College as sensitive receptors in the health risk assessment (HRA). The commenter cites the Area Plan PEIR and the air district's "Spare the Air" website as evidence that student athletes should be considered sensitive receptors in the HRA.

First, it should be noted that the air district's "Spare the Air" website is not the air district's guidelines for CEQA analysis. The Spare the Air website describes people most at risk for the general impacts of air pollution, and includes children, seniors, and active adults. These receptor types are specifically identified as more susceptible to *acute* and *short-term* health effects due to elevated concentrations of ozone and particulate matter. The HRA evaluates lifetime cancer risk and annual average particulate matter concentrations, per the air district's thresholds and CEQA Guidelines, and does not evaluate acute and short-term health effects. The air district's CEQA guidelines define sensitive receptors as "facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include schools, hospitals and residential areas."[5] The CEQA Guidelines further describes sensitive receptors as the following:

> *Sensitive individuals refer to those segments of the population most susceptible to poor air quality: children, the elderly, and those with pre-existing serious health problems affected by air quality (ARB 2005). Examples of receptors include residences, schools and school yards, parks and play grounds, daycare centers, nursing homes, and medical facilities. Residences can include houses, apartments, and senior living complexes. Medical facilities can include hospitals, convalescent homes, and health clinics. Playgrounds could be play areas associated with parks or community centers. (BAAQMD CEQA Guidelines, page 5-8)*

The ARB 2005 source cited by the air district states, "Sensitive individuals refer to those segments of the population most susceptible to poor air quality (i.e., children, the elderly, and those with pre-existing serious health problems affected by air quality). Land uses where sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare

[5] BAAQMD, *California Environmental Quality Act Air Quality Guidelines*, May 2017, *http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en*, accessed February 2019.

centers, nursing homes, hospitals, and residential communities (sensitive sites or sensitive land uses)."[6]

In order to evaluate nearby student children as sensitive receptors, the HRA evaluated student receptors at the Archbishop Riordan High School, which is located immediately adjacent to the project site boundary to the north, approximately 30 feet away (see SEIR Appendix E, *Air Quality Technical Memorandum*, Table 9). The HRA also evaluated eight additional school and 16 daycare locations as sensitive receptors, including the City College Child Development Lab School. Therefore, the HRA already assesses health risks at all nearby schools with children receptors.

The commenter states that the Area Plan PEIR also states that persons engaged in strenuous exercise are sensitive receptors. The Area Plan PEIR states on page 251 that certain land uses, including "schools, children's day care centers, playgrounds, hospitals, and convalescent homes" are considered "more sensitive than the general public to poor air quality". The PEIR also states on p. 251, "Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality". Although this is true, increased sensitivity to poor air quality is not the sole criterion for what defines a sensitive receptor, as discussed above with regard to the air district's CEQA guidelines. The air district does not consider adult or student athletes as sensitive receptors. It is worth noting that the Area Plan PEIR goes on to state on p. 251, "Residential areas are considered more sensitive to air quality conditions compared to commercial and industrial areas because people generally spend longer periods of time at their residences, with associated greater exposure to ambient air quality conditions". The HRA includes all residential receptor locations within 1,000 meters of the project site, in addition to all schools and daycares within the same radius.

The commenter accurately claims that strenuous activities, such as those conducted by student athletes, would result in higher exposure to air pollution than the general student population. Exercise raises an individual's breathing rate, and a higher breathing rate means a higher exposure to air pollution. It is worth noting that age plays a significant role in the impacts of air pollution on health; the younger a student or child is, the higher the exposure to air pollution will be, and the higher risk of cancer or other health effects are.[7] For example, children age 0-2 have an "age sensitivity factor" of 10, which means their risk of cancer from the same TAC exposure is ten times higher than an adult receptor; children age 2-16 have an age sensitivity factor of 3. At age 16, the age sensitivity factor is 1, because the student is considered an adult. Younger receptors also have higher average breathing rates, increasing their exposure as compared to older receptors with lower average breathing rates.

Because of this age sensitivity in younger populations, the HRA conservatively characterizes all school receptors as within the 2 to 16-year age group, including all high school receptors at the Archbishop Riordan High School. This is highly conservative from an exposure perspective because the breathing rate used in the HRA for these receptors is the average breathing rate for children ages 2 to 16, and most or all high school students would be ages 13 to age 18; the average

---

6 CARB, *Air Quality And Land Use Handbook: A Community Health Perspective*, April 2005, https://ww3.arb.ca.gov/ch/handbook.pdf, accessed October 2019.

7 California Environmental Protection Agency (CalEPA), Office of Environmental Health Hazard Assessment (OEHHA), *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment*, February 2015, *https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf*, accessed March 26, 2018.

breathing rate for children age 13 to 18 is much higher. In addition, the HRA assumes that al school receptors would be exposed to 14 years of construction and operational TAC emissions, representing the full age group duration from age 2 through age 16. Again, this is highly conservative because no individual student receptor at Archbishop Riordan High School would likely be exposed to the Project's TAC emissions for greater than four or five years. These exposure parameters are consistent with BAAQMD HRA guidelines.[8] Refer to SEIR Appendix E, *Air Quality Technical Memorandum*, for additional discussion of the exposure parameters used in the HRA (also see Table 10, page 21).

The City College student athlete receptor would be potentially exposed to 4-6 years of construction and/or operational emissions during the age of 18-24, which represents a far lower exposure than the current school and daycare receptors included in the HRA due to the age difference (as discussed above). Although breathing rates are greater for individuals engaged in exercise or other strenuous activities, the breathing rates for young adults engaged in strenuous activities are actually *lower* than the breathing rates used for the Archbishop Riordan High School receptors. The HRA uses an average breathing rate of 520 liters per kilogram body weight per 8-hour period (L/kg-8hrs) (the time period during which the student receptor is present), which is the 95th percentile 8-hour breathing rate for moderate intensity activities for receptors within the age group of 2 to 16 years, as recommended by BAAQMD.[9] According to the source document for the breathing rates recommended by BAAQMD and OEHHA and used in the HRA, males ages 11 to 16 who are engaged in high-intensity activities have a breathing rate of approximately 456 L/kg-8hrs, and males age 16 to 21 have a breathing rate of approximately 340 L/kg-8hrs (females have lower average breathing rates than males).[10,11] Therefore, a high school student engaged in strenuous activities would likely have a breathing rate of approximately 456 L/kg-8hrs, as compared to the breathing rate of 520 L/kg-8hrs used in the HRA for all school receptors; a college student engaged in strenuous activities would likely have a breathing rate of 340 L/kg-8hrs, which is the high-intensity activity breathing rate for ages 16 to 21. When compared with the exposure duration of 14 years and a breathing rate of 520 L/kg-8hrs used in the HRA for all school receptors, a college-age student athlete exposed for 5 years would have an exposure that is approximately 10 percent of the exposure than the school receptors included in the SEIR would have (i.e., 90% less exposure).[12] Therefore, the general exposure assumptions used in HRA for school receptors are

8 BAAQMD, *Air Toxics NSR Program Health Risk Assessment Guidelines,* December 2016, *http://www.baaqmd.gov/~/media/files/planning-and-research/permit-modeling/hra_guidelines_12_7_2016_clean-pdf.pdf?la=en*, accessed October 2019.

9 BAAQMD, *Air Toxics NSR Program Health Risk Assessment Guidelines,* December 2016, *http://www.baaqmd.gov/~/media/files/planning-and-research/permit-modeling/hra_guidelines_12_7_2016_clean-pdf.pdf?la=en*, accessed October 2019.

10 U.S. EPA, *Metabolically Derived Human Ventilation Rates: A Revised Approach Based Upon Oxygen Consumption Rates*, May 2009, EPA/600/R-06/129F, https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=202543, accessed December 2019.

11 The reason the moderate-intensity activity average breathing rate for the 2<16 age group is 520 L/kg-8hrs, which is higher than the age-specific high-intensity activity average breathing rates for the 11<16 and 16<21 age groups presented here, is because of the very high breathing rates for younger children. For example, the high-intensity activity average breathing rates are 1,387 L/kg-8hrs for age 2, 1,041 L/kg-8hrs for age 3<6, and 677 L/kg-8hrs for age 6<11.

12 Based on a breathing rate that is 88% of a school receptor (456 vs. 520), total hours that are 36% of a school receptor (7,200 vs. 20,160), and an age sensitivity factor that is 33% of a school receptor (1 vs. 3).

already more conservative than age-specific exposure assumptions for potential high school and college student athletes engaged in strenuous activities.

In addition, the City College student receptor would likely be located at the Community Health and Wellness Center, the swimming pool, or the track, which are approximately 1,150 feet, 1,000 feet, and 1,300 feet east of the project site, respectively. For comparison, the closest school receptor included in the HRA is 30 feet north of the site (Archbishop Riordan High School) and the closest daycare receptor included in the HRA is 30 feet west of the site (Shining Stars Family Child Center). Therefore, the TAC concentrations at the City College athlete receptor would be much lower than the concentrations at the receptor locations currently analyzed because concentrations decline substantially with distance, and health risks correlate directly with TAC concentrations for the same age groups and other exposure parameters.

The commenter's assertion that not including City College athletes in the HRA is a violation of San Francisco Administrative Code chapter 31 is incorrect. Chapter 31 of the San Francisco Administrative Code consists of implementing procedures for the City and administrative actions to be performed by the San Francisco Planning Department. As described above, the air quality and HRA analysis have been conducted in accordance with the CEQA Guidelines and the air district's CEQA Guidelines.

For these reasons, the HRA conservatively estimates health risks at sensitive receptor locations most susceptible to the project's TAC emissions, and any health risks for a City College student athlete receptor would be lower than those already reported in the HRA and draft SEIR for school and daycare receptors.

Comment AQ-2: Construction Schedule

This response addresses comments from the commenter listed below; each comment on this topic is quoted in full below this list:

I-HEGGIE2-20
I-MARABELLO2-1

"The EIR construction modeling of air quality in Appendix D assumes three years. Again, six years is the Developers Option and should be the default, not three years which is not recommended due to air quality and other impacts."

*(Jennifer Heggie, Email, September 23, 2019 [*I-HEGGIE2-20*])*

"INADEQUACY OF ESTIMATED NUMBER OF CONSTRUCTION WORKING DAYS PER YEAR

To calculate Average Daily Emissions of ROG, NOx, PM10, and PM2.5, the SEIR's analyses use a multiplier of 260-262 days. This would grossly underestimate the emissions in the very likely scenario where construction happens on more than 262 days per year. Commercial construction sites all around the city are routinely working 6 or even 7 days a week.

And this project will be no different. As you know, the developer is allowed to construct seven days a week, which is consistent with San Francisco Police Code section 2908.

And to keep this project on schedule and keep costs in line, the developers will work many weekends.

Thus, the estimates for emissions and necessary mitigation offsets should account for more working days.

If construction happens on just an additional 27 Saturdays and/or Sundays, this will increase all emissions by 10%. If developers average 6 construction days a week, this will inflate emissions by 19.8%. That percentage doubles if construction averages 7 days a week.

Let's assume a very likely average of construction occurring 6 days a week. This would cause the NOx levels to cross the significance threshold for both the Developers Proposed Option and the Additional Housing Option under both the six-year and compressed three-year schedules. As well, PM10, and PM2.5 will increase significantly. Thus, all lifetime excess cancer risks should be adjusted.

All four of the proposed option-schedule scenarios would trigger the implementation of Mitigation Measure M-AQ-2d. Thus, mitigation offsets would need to increase dramatically.

It's deceptive to use an unrealistic construction working days per year. Why not use a more realistic number so the developer and the public know the maximum or at least truer impacts? Should they come in under the number of estimated days, great. The monitoring will support them and they'll save money and lives."

*(Brian Marabello, Email, September 23, 2019 [*I-MARABELLO2-1*])*

Response AQ-2: Construction Schedule

This response addresses the comment that the air quality analysis should have assumed six years in the emissions modeling, not three years. It also addresses the comment that the air quality analysis should have accounted for weekend days of construction, instead of the 260-262 annual construction work days assumed in the analysis, which represents weekdays only. The commenter claims that the air quality analysis underestimates average daily criteria pollutant emissions, the required emissions offsets per Mitigation Measure M-AQ-2d, and health risks associated with construction TAC emissions.

The air quality analysis modeled six years of construction and the results of that analysis are presented in the SEIR. As stated on page 3.D-45 of the SEIR, "With regard to construction schedule and phasing, the analysis assumed that Phase 0 (site preparation and grading) would require a full year, followed by Phase 1 construction for 30 months, followed by Phase 2 construction for 30 months, for a full construction duration of six years. This is the longest feasible timeline as anticipated by the project sponsor."

The project sponsor developed a detailed construction schedule based on the number of anticipated work days and the equipment fleet necessary for construction. This schedule and total equipment hours are based on an average of 5 days of construction during the week, and conservatively lasts for a total of six years. According to the project sponsor, the vast majority of construction would occur 5 days per week, with occasional work on Saturdays. However, weekend days are rarely full 8 to 10 hour days of activity and are more typically 2 to 6 hours of activity. The draft SEIR assumed that soil export would occur 6 days per week for 2 months during excavation activities. This includes some weekend activity.

However, the air quality impacts are determined assuming that the project could be constructed over three years instead of six years. This is because all air quality impacts would increase under the three-year construction schedule compared to the six-year construction schedule, and the SIER evaluated impacts for the most conservative possible construction scenario for the proposed project. The SEIR estimates emissions and health risks under the three-year construction schedule, which includes weekend days of construction, and represents the shortest possible construction schedule. This compressed schedule was developed in consultation with the project sponsor and includes weekend days of construction because the amount of construction activity required to build the project in three years could not feasibly be conducted only during the work week. Impacts are based on both weekday and weekend days of construction.

The commenter claims that if construction occurred 6 or 7 days per week, emissions would increase by 10 to 40 percent from what was reported in the draft SEIR, and NO_x would likely exceed the significance thresholds. If construction would occur 6 or 7 days per week, the total number of equipment hours would not change; only the duration of construction would change (i.e., it would decrease). Therefore, if the analysis assumed construction would occur 6 or 7 days per week, the average daily and total construction emissions would not change; only total annual emissions may increase for the years when construction occurs, which would be less than six years for the reasons identified above.

As stated on SEIR pp. 3.D-50 to 3.D-51 with regard to criteria pollutant impacts, "because the construction schedule could be compressed into three years, average daily combined construction and operational emissions could increase substantially, increasing the ROG and NOx emissions. It is estimated that this shortened construction schedule could result in average daily criteria pollutant emissions that are 1.5 to 2.5 times greater than those presented in SEIR Table 3.D-8a. Therefore, the potential condensed project construction schedule and phasing would likely increase the NOx impact." With regard to health risk impacts, the SEIR states on pp. 3.D-75 to 3.D-76 that under the three-year construction schedule, "the excess lifetime cancer risk at offsite

sensitive receptor locations would increase" and the "the annual average PM2.5 concentrations at offsite sensitive receptor locations would increase, contributing further to the impact".

To mitigate impacts, Mitigation Measure M-AQ-2d (Offset Construction Emissions for the Compressed Schedule) requires NO_X offsets based on the amount of NO_X that exceeds the air district's threshold of 54 pounds per day over the duration when this threshold is exceeded. As explained on SEIR pp. 3.D-53 through 3.D-56, this measure would require a one-time reduction of 2.0 tons per year of ozone precursors for the Developer's Proposed Option or 3.2 tons per year of ozone precursors for the Additional Housing Option. This calculation assumes 260 to 262 work days of construction per year. However, emissions are based on total equipment hours, not work days (as discussed above). Additional weekend days of construction would not increase the equipment hours, it would only reduce the number of equipment hours occurring per day (e.g., fewer hours on weekdays, more hours on weekend days). In this event, average daily emissions would go *down*, not up, and Mitigation Measure M-AQ-2d would be sufficient to reduce ozone precursor emissions to less than the threshold.

The commenter further claims that if construction occurs over 6 or 7 days per week, the total amount of PM_{10} and $PM_{2.5}$ would increase, and health risks would also increase. As discussed above, construction activities on weekends would not increase total emissions, it would only change when the emissions occur throughout the construction period (i.e., more emissions over a shorter overall duration with the same number of workdays). The total TAC emissions for the project would remain approximately the same. This could mean, however, that more TAC emissions could occur during more susceptible sensitive receptor age groups, such as the 0-2 age group. As such, the DEIR conservatively assumes that construction could occur over a compressed three-year period with regard to health risks, which would already account for this shift in emissions timing. As stated on SEIR p. 3.D-80, "… the project may be constructed over a shorter timeframe than assumed in this analysis. This could result in increased cancer risks to offsite receptors as well as increased $PM_{2.5}$ concentrations for both offsite and onsite receptors. Therefore, potential changes in the construction schedule could result in a significant and unavoidable impact."

In order to present the maximum impact of the proposed project, the three-year construction schedule was used. Because this is a possibility due to the unknowns associated with construction phasing depending on market conditions and other unanticipated factors, the SEIR conservatively uses this scenario to determine the air quality impacts of the proposed project. The SEIR concluded on pp. 3.D-56 and 3.D-80 that both criteria air pollutant impacts and health risk impacts would be significant and unavoidable with mitigation under the compressed three-year construction schedule. Therefore, construction occurring 6 or 7 days per week would not result in a new NO_X exceedance or a new impact. As such, the draft SEIR finds a significant and unavoidable impact due to the uncertainty associated with the construction schedule, and this uncertainty incorporates the potential for accelerated construction activities which may include weekend construction.

Comment AQ-3: Mitigation Measure

This response addresses comments from the commenter listed below; each comment on this topic is quoted in full below this list:

A-BAAQMD-1

"However, even with these Project design features and on-site mitigation measures, the DSEIR finds that air quality impacts from the Project still exceed the City's thresholds of significance for the compressed schedule. Therefore, Mitigation Measure M-AQ-2d: Offset Construction Emissions for the Compressed Schedule (M-AQ-2d) proposes that the Project applicant provide funds to achieve additional emission reductions to reduce air emissions below the thresholds of significance. To this end, M-AQ-2d states that the Project applicant would provide funding to the Air District to fund emissions reduction projects in the region in order to offset the remaining criteria pollutant emissions generated by construction during the compressed schedule.

Please be aware that the Air District does not currently have a fee program for offsetting emissions. These are occasionally conducted on a case-by-case basis based on available projects. We recommend that M-AQ-2d replace "Air District" with "governmental entity". This will allow the project applicant to seek additional options if the Air District has no available projects at the time."

*(Greg Nudd, Deputy Air Pollution Control Officer, BAAQMD, Letter, September 23, 2019 [*A-BAAQMD-1*])*

Response AQ-3: Mitigation Measure

The City incorporated the air district's Clean Air Foundation into Mitigation Measure M-AQ-2d (Offset Construction Emissions for the Compressed Schedule) because the air district has previously supported the use of ozone precursor emissions offsets for other CEQA projects in San Francisco, including the Potrero Power Station Mixed-use Project (Mitigation Measure M-AQ-2f), the Golden State Warriors Event Center and Mixed-Use Development at Mission Bay Blocks 29-32 (Mitigation Measure M-AQ-2b), and the Seawall Lot 337 and Pier 48 Mixed-Use Project (Mitigation Measure M-AQ-1.5). All of these mitigation measures reference the air district's Clean Air Foundation and ozone precursor emissions offsets projects. In addition, based on correspondence with the air district, the air district provided the City with an "Offsite Mitigation Program Questionnaire" for the City to complete and submit to the air district.[13] Upon submitting the questionnaire, the air district indicated that they would follow up with a "fee calculation analysis, should the program be administered through our Clean Air Foundation," and that their "offsite mitigation program" could also include PM emission offsets if needed.

In addition, in 2016, the air district issued a Mitigation Project Agreement for the Faria Preserve Residential Development and VTM 9342, through the Clean Air Foundation, with the purpose of

[13] Areana Flores, Environmental Planner, Bay Area Air Quality Management District. Email correspondence with Brian Schuster, ESA, on July 9, 2019, and July 22, 2019.

assisting "Faria Preserve in satisfying the requirements of Mitigation Measure 3.3-l(b)," which is the EIR's ozone precursor offsets mitigation measure.[14] The agreement would also "ensure the proper funding and management of an emissions reduction program to offset ozone precursor emissions attributable to construction of the Faria Preserve Residential Development" to address Faria Preserve's obligation to satisfy the requirements of Mitigation Measure 3.3.l(b).

Based on this correspondence, it was the City's understanding at the time it prepared the SEIR that the air district had a grant program for offsetting ozone precursor emissions. However, in response to the air district's request, acknowledging that the air district's emissions reduction grant program is evolving, and because individual emission reduction projects needed to support the ozone precursor offsets required by Mitigation Measure M-AQ-2d (Offset Construction Emissions for the Compressed Schedule) have not yet been identified, Mitigation Measure M-AQ-2d is revised as follows (deleted text is shown in ~~strikethrough~~ and new text is shown in double underline):

> **Mitigation Measure M-AQ-2d**: **Offset Construction Emissions for the Compressed Schedule**. Under the compressed three-year construction schedule for either the Developer's Proposed Option or the Additional Housing Option, the project sponsor shall implement this measure. Prior to issuance of the final certificate of occupancy for the final building associated with Phase 1, the project sponsor, with the oversight of the ERO, shall either:
>
> 1. *Directly fund or implement a specific offset project within San Francisco if available* to achieve the equivalent to a one-time reduction of 2.0 tons per year of ozone precursors for the Developer's Proposed Option or 3.2 tons per year of ozone precursors for the Additional Housing Option. To qualify under this mitigation measure, the specific emissions offset project must result in emission reductions within the San Francisco Bay Area Air Basin that would not otherwise be achieved through compliance with existing regulatory requirements. A preferred offset project would be one implemented locally within the City and County of San Francisco. Prior to implementing the offset project, it must be approved by the ERO. The project sponsor shall notify the ERO within six months of completion of the offset project for verification; or
>
> 2. *Pay mitigation offset fees* to the Bay Area Air Quality Management District Bay Area Clean Air Foundation or other governmental entity or third party. The mitigation offset fee~~, currently estimated at approximately $30,000 per weighted ton, plus an administrative fee of no more than 5 percent of the total offset~~, shall fund one or more emissions reduction projects within the San Francisco Bay Area Air Basin. The fee will be determined by the planning department, the project sponsor, and the governmental entity or third party responsible for administering the funds ~~air district~~, and be based on the type of projects available at the time of the payment. This fee is intended to fund emissions reduction projects to achieve reductions of 2.0 tons per year of ozone precursors for the Developer's Proposed Option or 3.2 tons per year of ozone precursors for the Additional Housing Option, which is the amount required to reduce emissions below significance levels after implementation of other identified mitigation measures as currently calculated.

[14] Jeanie Poling, Senior Environmental Planner, San Francisco Environmental Planning. Email correspondence with Steven Vettel, Farella Braun & Martel LLP, on July 5, 2019.

The agreement that specifies fees and timing of payment shall be signed by the project sponsor, the governmental entity or third party responsible for administering the funds ~~air district~~, and the ERO prior to issuance of the first site permit. This offset payment shall total the predicted 2.0 tons per year of ozone precursors for the Developer's Proposed Option or 3.2 tons per year of ozone precursors for the Additional Housing Option above the 10-ton-per-year threshold after implementation of Mitigation Measures M-AQ-2a, M-AQ-2b, and M-AQ-2c.

The total emission offset amount is calculated by summing the maximum daily construction emissions of ROG and NOx (pounds/day), multiplying by 260 work days per year, and converting to tons. The amount represents the total estimated construction-related ROG and NOx emissions offsets required. No reductions are needed for operations or overlapping construction and operations.

This page intentionally left blank