

MEMORANDUM

To: **Shannon Hatcher**
California Air Resources Board
Shannon.Hatcher@arb.ca.gov

From: **Michael Keinath, PE**

Subject: **Emissions Reductions Pathways to AB734 Compliance**
Oakland Waterfront Ballpark District Project

1. INTRODUCTION

The purpose of this document is to provide additional support and emissions calculations showing how the Oakland Athletics (“A’s”) could achieve no net new greenhouse gas (GHG) emissions and meet their 50% local reduction target for the Oakland Waterfront Ballpark District Project (“Project”) Assembly Bill 734 (AB734) application. This submittal addresses the approach outlined in the February 28, 2020 letter from Oakland Mayor Libby Schaaf to Mr. Richard Corey of the California Air Resources Board (ARB), a copy of which is attached for your convenience and commits the A’s to be responsible to provide offsets for each backfill event in excess of the rounded historic average of four events per year.

The calculation of operational GHG emissions for the ballpark component of the Howard Terminal Project will assume, as set forth in the A’s Application, that GHG emissions from ballgames will be the same whether occurring at the Coliseum or Howard Terminal because team performance drives attendance. This yields a baseline assumption of no net additional ballpark operational GHG emissions from A’s ballgames. Additional GHG emissions from the backfilled events will be measured and added to the operational GHG emissions for the ballpark component of the Howard Terminal Project in accordance with the following:

The City of Oakland (the “City”), as the lead agency, will require the Oakland A’s to submit for its review and approval, an annual report to the City documenting the number of events, including information regarding the number of attendees of such events, held in the immediately preceding year at the existing Oakland Coliseum and its surrounding parking lot (the “Coliseum”) (the “Annual Event Report”). The Annual Event Report shall be submitted to the City commencing twelve (12) months following the opening day of the new ballpark at the Howard Terminal Project until the earlier of: the closing or demolition of the Coliseum or thirty (30) years.

March 10, 2020

Ramboll
 201 California Street
 Suite 1200
 San Francisco, CA 94111
 USA

T +1 415 796 1950
 F +1 415 398 5812
www.ramboll.com

Currently the Coliseum averages approximately four (4) non-A’s, non-Raiders events per year. As such, the Annual Event Report will document all events at the Coliseum above the existing four (4) total events (the “Additional Events”). The total attendance for the Additional Events will be the average attendance at all events at the Coliseum times the total number of events minus the four existing events:

$$\text{Additional Event Attendance} = \left[\frac{\text{Total Attendance for All Events}}{\text{Total Number of Events}} \right] \times [(\text{Total Number of Events}) - 4]$$

The intensity of emissions associated with each attendee will be calculated by applying the average attendee emission factor from the existing A’s games:

$$\text{Additional Event Emissions Factor} = \frac{10,600 \text{ MT CO}_2\text{e}}{82 \text{ games} \times 35,000 \text{ attendees}} = 0.0037 \frac{\text{MT CO}_2\text{e}}{\text{attendee} \cdot \text{event}}$$

The total quantity of GHG emissions associated with the Additional Events will be calculated by multiplying the additional event attendance by the additional event emissions factor:

$$\text{Additional Event GHG Emissions} = 0.0037 \frac{\text{MT CO}_2\text{e}}{\text{attendee} \cdot \text{event}} \times \text{Additional Event Attendance}$$

If the Annual Event Report documents that in the prior year there were Additional Events, the report will include the Additional Event GHG Emissions, as calculated above.¹

Upon the City’s review and approval of the Annual Event Report, the City shall require the Oakland A’s to offset the Additional Event GHG Emissions such that the operational GHG emissions from the ballpark will continue to be no net additional emissions and that the Project maintains its compliance with the requirement that no less than fifty percent (50%) of non-residential operational GHG emissions are offset through project design features, onsite reduction measures, or offsite reduction measures in the neighboring communities (collectively, the “Local Reduction Measures”). To the extent Local Reduction Measures are required, implementation of such measures shall be required to commence as soon as feasibly possible and the A’s shall enter into contracts for the purchase of additional offsets (if any necessary) no later than six months after the City’s review and approval of the Annual Event Report. If the implementation of Local Reduction Measures cause the Project to exceed the requirements of AB 734, then any excess offsets can be applied against future GHG Emission reduction requirements, including, without limitation, those resulting from future Additional Events. The A’s shall document compliance with the Additional Events obligations in subsequent Annual Event Reports.

To ensure the implementation of the Local Reduction Measures associated with the Additional Events, the project applicant agrees to fund an escrow account for the amount required to

¹ If, in any given year, the number of Additional Events exceeds 82, which reflects more than 86 total events at the Coliseum, then the Additional Event GHG Emissions shall be calculated by (Average Event Attendance) x (0.0037 MT CO₂e/attendee event) x (82 events).

mitigate the emissions associated with 43 Additional Events. The amount to be provided is \$290,910, based on the following:

Additional Events	43
Attendance	35,000
Emission Factor (MT CO ₂ e/attendee/event)	0.0037
Total Emissions (MT CO ₂ e)	5,558
Local Direct Reductions Required (MT CO ₂ e)	2,779
Approximate Cost for Local Direct Reduction ² (\$/MT CO ₂ e)	\$86.61
Local Direct Reduction Cost	\$241,156
Offsets Required (MT CO ₂ e)	2,779
Cost for Offsets ³ (\$/MT CO ₂ e)	\$17.87
Offset Cost	\$8,337
<u>Total Cost</u>	<u>\$290,910</u>

The escrow account would be funded prior to the issuance of the Temporary Certificate of Occupancy for the new Howard Terminal ballpark if, and when, the A' leave the Coliseum for a new ballpark at Howard Terminal. The escrow account will be terminated upon the earlier of (a) demolition of the Coliseum or (b) 30-years of Project operation.

Prior to this update, Ramboll showed that implementation of the Oakland Power Plant (OPP) variant would surpass the 50% local reduction required by AB734 assuming activity at the Coliseum stadium would end when the A's moved to the new stadium in 2023. For purposes of demonstrating that this reduction measure could be achieved without OPP and with any amount of backfill, we have provided updates to our emissions inventory and a menu of potential reductions to ensure that no less than 50% of net new non-residential emissions will be reduced locally.

Unless specified below, methodology and assumptions in these updates are consistent with the previous AB734 application update submitted on October 29, 2019. Only tables that have been added and key summary tables with values that have updated since the previous application are included.

2. IMPLEMENTATION

The following information is not new and has been submitted to ARB and discussed previously. It is reiterated below to provide a clarification as to how construction emissions are to be mitigated in light of recent clarifications by ARB on its understanding of the requirements of AB 734.

The Project will be constructed in phases or sub-phases, as market conditions dictate. Local Reduction Measures shall include project design features, on-site reduction measures and off-site reduction measures in neighboring communities (if any) (collectively, "Local Reduction Measures"). "Required

² See Section 4 for the derivation of the approximate cost for a local direct reduction.

³ According to *Financing Emissions Reductions for the Future: State of the Voluntary Carbon Markets 2019* from Ecosystem Marketplace (hubs.ly/H0m5qf60), in 2018, a total of \$295.7 million was spent purchasing 98.4 million MT CO₂e, indicating, on average, the cost of a voluntary offset is approximately \$3. However, this may underestimate as many of these offsets may not have been from an ARB accredited offset registry. Unfortunately, those registries do not release transaction and costs data. As a conservative measure, we assume that the cost of a voluntary offset would not exceed the cost of an AB 32 Cap-and-Trade compliance allowance, which was \$17.87 as of the February 2020 Joint Auction #22 (https://ww3.arb.ca.gov/cc/capandtrade/auction/results_summary.pdf).

Local Reduction Measures” shall be those Local Reduction Measures required to meet the obligations set forth in AB 734 pertaining to non-residential emissions.

Construction Emissions for horizontal development will be calculated and required contracts for purchase of offsets accounting for not more than 50% of non-residential horizontal construction emissions and the requisite amount of residential horizontal construction emissions shall be entered into no later than the issuance of a grading permit for each construction phase or subphase. Local Reduction Measures for 50% of non-residential horizontal construction emissions will be identified by the issuance of the first building permit for the first vertical building in the applicable phase and shall be implemented by the end of the applicable phase that encompasses those construction emissions.

Operational Emissions and vertical building construction emissions from non-residential buildings will be calculated based on the projected 30-year useful life for that building and any Required Local Reduction Measures will be identified and/or contracts for purchase of offsets entered into no later than the issuance of a temporary certificate of occupancy for each non-residential building in that phase or subphase. Operational Emissions and vertical construction emissions from residential buildings will be calculated based on the projected 30-year useful life of that building, including the calculation of the contribution such residential buildings make (if any) to Required Local Reduction Measures. Contracts for the purchase of requisite offsets shall be entered into no later than the issuance of a temporary certificate of occupancy for each residential building in that phase or subphase.

Prior to the issuance of a building permit for the first vertical building in the final phase of the Project, a calculation of total Project emissions from all sources (residential and non-residential, horizontal and vertical construction) including projected emissions from the proposed final phase shall be provided. In addition, a calculation of all Local Offset Measures and all offsets purchased to date for the total Project (excluding the proposed final phase) shall be provided. If the purchase of offsets would exceed 50% of the projected total Project emissions, then the Local Offset Measures identified for implementation in the final phase must be sufficient to reduce the total offset purchases to 50% or less of the total Project emissions. Any Required Local Reduction Measures identified in the calculations shall be implemented no later than the temporary certificate of occupancy of the final vertical building of the final phase of the Project unless: (i) calculations demonstrate that the obligations set forth in AB 734 pertaining to non-residential emissions have been achieved for the Project; or (ii) equivalent Local Reduction Measures have been provided; or (iii) equivalent monies have been escrowed by the issuance of the temporary certificate of occupancy of the final vertical building in the final phase of the Project to fund a Local Reduction Measure project.

In calculating the construction and operational emissions, the Oakland A’s will provide to the City or the Port calculations and related evidence demonstrating compliance with AB 734, including at the time the calculations are required as set forth above, identifying the Local Reduction Measures that have been or will be implemented by the completion of the Project, as well as contracts for the purchase of offsets from projects. As provided in AB 734, the A’s shall, to the extent feasible, place the highest priority on the purchase of offsets that produce emission reductions within the City of Oakland or the boundaries of the Bay Area Air Quality Management District. Any offset credits shall be verified by a third party accredited by the ARB and in no event shall offset credits be used from a project located outside the United States.

3. UPDATES TO EMISSION INVENTORY INPUTS

As stated above, the emissions inventory was updated in this memorandum in response to ARB’s recent feedback regarding construction emissions, as well as to show that the Project would meet the 50% local reduction measure and ARB’s interpretation of the 50% offset cap if the OPP variant is not

implemented. The following updates were made:

- **Construction Assumptions:** In this update, it is assumed that emissions from the construction of non-residential land uses would be included in the calculation of non-residential emissions that need to be 50% reduced locally. The emissions calculations have not been changed since the previous submittal, but the inclusion of those emissions in the local reduction calculation is new.
- **EV Charging Assumptions:** This analysis reverts back to a prior submission dated August 26, 2019 which assumes that 10% of parking spaces across all land uses on the Project site would have EV chargers.

These updates have been incorporated in the revised **Tables 12** and **13**. The revised tables show two potential paths to the 50% local reduction target/50% offset cap assuming no Additional Events occur at the Coliseum: **Table 12** shows a path assuming implementation of the OPP Variant and **Table 13** shows a path assuming the OPP Variant is not implemented.

The Project would result in 977,521 MT CO_{2e} of net new non-residential project emissions over a 30-year lifetime. The Project has committed to a TDM/TMP plan and installation of EV chargers at 10% of Project parking spaces, which reduces emissions over 30 years by 395,717 MT CO_{2e}. The potential path to the 50% local reduction presented in **Table 12** incorporates the OPP Variant, which accounts for a reduction of 520,655 MT CO_{2e}. The potential path to the 50% local reduction presented in **Table 13** incorporates electrification of 50% of residential units and the installation of 751 off-site residential EV chargers in the local community. These local reductions account for 18,582 and 265,565 MT CO_{2e}, respectively.

4. POTENTIAL TO REDUCE EMISSIONS LOCALLY

Table 14 and the text below shows the estimated emissions per attendee per Additional Event and summarizes the local, direct reductions that the A's could implement, as needed, to meet the AB734 requirements. Emissions are provided in relative units; all emissions reductions shown here can be scaled linearly based on the units in the table, except for reduced on-site parking. Each emissions reduction is categorized as either on-site or off-site based on its location. Below is a brief description of each potential reduction.

Potential On-Site Reductions

Depending on the status of the OPP variant and Coliseum stadium backfill, the A's could choose to do any number of potential on-site reductions. Each of these reductions is shown in **Table 14**. Consistent with the Project emissions inventory, each on-site reduction is assumed to have a 30-year lifetime.

- **On-site Solar Panels:** this estimates the emissions reduction associated with on-site generation of renewable electricity, as shown in Table OP-19 that was included in the October 2019 submittal. This reduction assumes a 30-year lifetime for the solar panels beginning in 2023.
- **No Natural Gas for Residential Units:** this estimates the reduction in emissions from natural gas consumption by assuming that natural gas usage from a single Project residential unit is replaced by grid electricity, as shown in Table OP-20 that was included in the October 2019 submittal. It is assumed that the all-electric residences have a 40% higher kilowatt-hour usage compared to buildings with natural gas domestic hot water, space heating and appliances, as estimated by Meyers+ Engineers. The cost of this on-site reduction would be due to the additional electricity charges for the residential units. However, since tenants are responsible for costs associated with their own electricity usage, there is no cost associated with this reduction for the A's.

- **On-site Waste Diversion:** this estimates the reduction associated with each ton of waste diverted, using the CO_{2e} emission factor estimated in Table OP-5 that was included in the October 2019 submittal.
- **Reduced On-site Parking:** this estimates the reduction in emissions associated with fewer mobile trips to the Project site due to reduced parking spaces on-site. The methodology is consistent with that shown in Table OP-2, with trips and mileage-based estimates provided by Fehr & Peers.⁴

Potential Off-Site Reductions

In addition to the various on-site reductions that the A's could do, the A's could install off-site neighborhood EV chargers to reduce emissions locally. Unlike on-site EV chargers, off-site EV chargers are assumed to have a lifetime of 10 years. Details are shown in **Table 14**.

- **Off-site Neighborhood EV Chargers:** this estimates the reduction in GHG emissions associated with the installation of an EV charger in a local off-site residential community. This reduction is quantified in new Table OP-22. The lifetime emissions reduction associated with off-site EV chargers is 127 MT CO_{2e} per charger. The average cost for a Level 2 EV charger is ~\$3,000, with a range from \$400 to \$6,500 per charger.^{5,6} Installation costs are roughly \$4,000 - \$4,500 in the California markets studied (San Francisco, Los Angeles and San Diego), as compared to the average cost throughout the United States of ~\$3,100.⁷ Assuming the total cost of a charger for equipment and installation in California are in the \$7,000 (California average) to \$11,000 (California high-end) range, the resulting in a cost per metric ton between \$55.12 to \$86.61 per MT CO_{2e}.

This assumption is reasonable, as 43 Additional Events with 35,000 attendees could reasonably be offset by the installation of 22 local community EV chargers. To be conservative, the \$86.61/MT CO_{2e} high-end estimate for EV chargers was increased in case any of the higher cost off-site reductions are implemented instead.

⁴ Based on communication with Fehr & Peers on February 12, 2020, for every 500 on-site parking spaces removed from the project design, there would be 540 fewer trips for large events and concerts, 10,320 fewer miles travelled for weekday games, 10,920 fewer miles traveled for weekend games, and 8,890 fewer miles traveled for concerts. This reduction is capped at 2,000 spaces.

⁵ National Renewable Energy Laboratory. 2019. Best Practices for Electric Vehicle Supply Equipment Installations in the National Parks. Golden, CO: NREL/TP-5400-74806. Available at: www.nrel.gov/docs/fy20osti/74806.pdf.

⁶ New West Technologies, LLC. 2015. Costs Associated with Non-Residential Electric Vehicle Supply Equipment. Prepared for the U.S. Department of Energy Vehicle Technologies Office. DOE/EE-1289. Available at: afdc.energy.gov/files/u/publication/evse_cost_report_2015.pdf.

⁷ Idaho National Laboratory. 2015. How do Publicly Accessible Charging Infrastructure Installation Costs Vary by Geographic Location? INL/MIS-15-35319. Available at: avt.inl.gov/sites/default/files/pdf/EVProj/HowDoPubliclyAccessibleInfrastructureInstallationCostsVaryByGeographicLocation.pdf.

**Table 12. Year-by-Year Comparison of GHG Emissions with Oakland Power Plant
Oakland Waterfront Ballpark District Project
Oakland, California**

Year ¹	Existing Conditions Emissions	Project 1.0 Operational Emissions ^{2,6}	Project 2.0 Operational Emissions ^{2,6}	Construction Emissions	Non-Residential Construction Emissions	Net New Emissions			Direct Local Reductions			
						Non-Residential Emissions ⁴	Residential Emissions ⁴	Total Emissions to Reduce or Offset ^{3,6}	Required Direct Local Offsets (50% of Non-Residential)	TMP + TDM + Onsite EV Charging ⁵	Peaker Power Plant	Total Direct Local Reductions
MT CO ₂ e/year												
2020	0	0	0	333	245	245	87	333	123	0	0	0
2021	0	0	0	5,580	4,359	4,359	1,220	5,580	2,180	0	0	0
2022	0	0	0	5,939	4,645	4,645	1,294	5,939	2,322	0	-185	-185
2023	-10,600	12,889	10,504	3,543	2,686	4,738	1,094	5,833	2,369	2,385	-34	2,351
2024	-10,600	24,490	19,740	3,572	2,103	13,121	4,341	17,462	6,561	4,750	16,775	21,525
2025	-10,600	23,786	19,186	3,793	2,228	12,615	4,365	16,980	6,307	4,600	16,819	21,419
2026	-10,600	23,149	18,681	4,760	2,794	12,608	4,700	17,308	6,304	4,468	16,864	21,331
2027	-10,600	36,832	30,098	3,056	1,793	21,353	7,935	29,288	10,677	6,734	16,908	23,642
2028	-10,600	64,390	49,614	0	0	39,260	14,530	53,790	19,630	14,776	16,953	31,729
2029	-10,600	62,853	48,415	0	0	38,046	14,207	52,253	19,023	14,438	16,997	31,435
2030	-10,600	61,485	47,337	0	0	36,966	13,920	50,886	18,483	14,148	17,042	31,190
2031	-10,600	60,233	46,340	0	0	35,977	13,656	49,633	17,988	13,893	17,086	30,979
2032	-10,600	59,099	45,425	0	0	35,082	13,417	48,499	17,541	13,674	17,130	30,804
2033	-10,600	58,066	44,581	0	0	34,267	13,199	47,467	17,134	13,485	17,174	30,659
2034	-10,600	57,120	43,796	0	0	33,522	12,998	46,520	16,761	13,324	17,218	30,541
2035	-10,600	56,256	43,069	0	0	32,842	12,814	45,656	16,421	13,187	17,262	30,449
2036	-10,600	55,466	42,393	0	0	32,221	12,645	44,867	16,111	13,074	17,306	30,380
2037	-10,600	54,741	41,760	0	0	31,651	12,489	44,141	15,826	12,980	17,350	30,330
2038	-10,600	54,077	41,171	0	0	31,131	12,346	43,477	15,566	12,906	17,394	30,300
2039	-10,600	53,469	40,621	0	0	30,655	12,214	42,869	15,327	12,848	17,438	30,286
2040	-10,600	52,909	40,104	0	0	30,216	12,093	42,309	15,108	12,805	17,482	30,286
2041	-10,600	52,387	39,614	0	0	29,809	11,978	41,787	14,904	12,773	17,526	30,298
2042	-10,600	51,909	39,155	0	0	29,435	11,874	41,309	14,717	12,754	17,569	30,323
2043	-10,600	51,461	38,718	0	0	29,085	11,776	40,861	14,543	12,743	17,613	30,357
2044	-10,600	51,035	38,296	0	0	28,754	11,682	40,436	14,377	12,740	17,657	30,397
2045	-10,600	50,631	37,888	0	0	28,438	11,593	40,031	14,219	12,743	17,701	30,444
2046	-10,600	50,567	37,845	0	0	28,387	11,580	39,967	14,194	12,722	17,701	30,424
2047	-10,600	50,516	37,810	0	0	28,347	11,570	39,916	14,173	12,706	17,701	30,407
2048	-10,600	50,477	37,783	0	0	28,315	11,562	39,877	14,157	12,693	17,701	30,395
2049	-10,600	50,450	37,766	0	0	28,293	11,557	39,850	14,146	12,684	17,701	30,385

**Table 12. Year-by-Year Comparison of GHG Emissions with Oakland Power Plant
Oakland Waterfront Ballpark District Project
Oakland, California**

Year ¹	Existing Conditions Emissions	Project 1.0 Operational Emissions ^{2,6}	Project 2.0 Operational Emissions ^{2,6}	Construction Emissions	Non-Residential Construction Emissions	Net New Emissions			Direct Local Reductions			
						Non-Residential Emissions ⁴	Residential Emissions ⁴	Total Emissions to Reduce or Offset ^{3,6}	Required Direct Local Offsets (50% of Non-Residential)	TMP + TDM + Onsite EV Charging ⁵	Peaker Power Plant	Total Direct Local Reductions
MT CO ₂ e/year												
2050	-10,600	50,468	37,784	0	0	28,305	11,563	39,868	14,152	12,684	17,701	30,385
2051	-10,600	50,468	37,784	0	0	28,305	11,563	39,868	14,152	12,684	17,701	30,385
2052	-10,600	50,468	37,784	0	0	28,305	11,563	39,868	14,152	12,684	17,701	30,385
2053	0	42,462	31,370	0	0	30,872	11,590	42,462	15,436	11,091	17,701	28,793
2054	0	39,040	28,336	0	0	27,468	11,572	39,040	13,734	10,704	0	10,704
2055	0	39,037	28,333	0	0	27,465	11,572	39,037	13,733	10,704	0	10,704
2056	0	38,992	28,300	0	0	27,465	11,527	38,992	13,733	10,692	0	10,692
2057	0	4,971	3,530	0	0	4,951	20	4,971	2,476	1,441	0	1,441
Total	-317,998	1,646,649	1,250,933	30,576	20,854	977,521	381,707	1,359,227	488,760	395,717	520,655	916,372
Maximum Allowable Offset Credits⁷ (50% of Total Emissions)								679,614	% Local Reduction Measures			94%

Notes:

- Emissions decrease over time due to transportation and electricity (for both building energy use and water treatment and distribution) becoming cleaner. A linear interpolation is used to take into account decrease in electricity intensity factor due to Renewable Portfolio Standards. The decrease in vehicle emission factors over time is based on Alameda County fleet-average emission factors from 2020-2050. The estimate assumes no change after 2050, since EMFAC2017 does not project past 2050.
- Emissions assume all buildings become operational as soon as Phase is constructed, based on percent of operational land uses by Phase and percent of operation per year. The first calendar year is adjusted for partial operation based on start date and the last calendar year is adjusted for partial operation such that total lifetime for each land use sums to 30 years.
- Net new emissions to reduce or offset include Existing Conditions Emissions, Project 1.0 Operational Emissions, Construction Emissions, and Backfill.
- Net new non-residential emissions include Existing Conditions Emissions, Project 1.0 Non-Residential Operational Emissions, and Backfill. A portion of the construction emissions corresponding to the percent of building square footage that is non-residential was included. The remainder of emissions are considered residential.
- This analysis assumes that 10% of onsite parking spaces will be equipped with an EV charger.
- The analysis presented here does not include anticipated additional reductions from Project features associated with LEED Gold design or from local air quality mitigation measures with GHG co-benefits. The Project is committed to achieving LEED Gold Standard, which requires projects to obtain points in the areas of Location & Transportation, Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality, Innovation, and Regional Priority. Many of these measures, such as optimizing energy performance, demand response, and renewable energy production, would allow the Project to achieve further GHG reductions locally that are not captured in this analysis.
- Per CARB's interpretation of AB734, up to 50% of the total net new emissions for the Project can be reduced with offset credits on the carbon market.

Abbreviations:

CO₂e - carbon dioxide equivalents
 MT - metric ton
 NPV - net present value
 yr - year

**Table 13. Year-by-Year Comparison of GHG Emissions without Oakland Power Plant
Oakland Waterfront Ballpark District Project
Oakland, California**

Year ¹	Existing Conditions Emissions	Project 1.0 Operational Emissions ^{2,7}	Project 2.0 Operational Emissions ^{2,7}	Construction Emissions	Non-Residential Construction Emissions	Net New Emissions			Direct Local Reductions ⁶				
						Non-Residential Emissions ⁴	Residential Emissions ⁴	Total Emissions to Reduce or Offset ^{3,7}	Required Direct Local Offsets (50% of Non-Residential)	TMP + TDM + Onsite EV Charging ⁵	Electrification of 50% of Residential Units	751 Offsite Neighborhood EVCS	Total Direct Local Reductions
MT CO ₂ e/year													
2020	0	0	0	333	245	245	87	333	123	0	0	0	0
2021	0	0	0	5,580	4,359	4,359	1,220	5,580	2,180	0	0	0	0
2022	0	0	0	5,939	4,645	4,645	1,294	5,939	2,322	0	0	0	0
2023	-10,600	12,889	10,504	3,543	2,686	4,738	1,094	5,833	2,369	2,385	5.9	10,626	13,017
2024	-10,600	24,490	19,740	3,572	2,103	13,121	4,341	17,462	6,561	4,750	75	10,318	15,143
2025	-10,600	23,786	19,186	3,793	2,228	12,615	4,365	16,980	6,307	4,600	77	10,014	14,691
2026	-10,600	23,149	18,681	4,760	2,794	12,608	4,700	17,308	6,304	4,468	80	9,744	14,291
2027	-10,600	36,832	30,098	3,056	1,793	21,353	7,935	29,288	10,677	6,734	206	9,504	16,445
2028	-10,600	64,390	49,614	0	0	39,260	14,530	53,790	19,630	14,776	471	9,295	24,542
2029	-10,600	62,853	48,415	0	0	38,046	14,207	52,253	19,023	14,438	484	9,115	24,036
2030	-10,600	61,485	47,337	0	0	36,966	13,920	50,886	18,483	14,148	497	8,960	23,606
2031	-10,600	60,233	46,340	0	0	35,977	13,656	49,633	17,988	13,893	510	8,829	23,233
2032	-10,600	59,099	45,425	0	0	35,082	13,417	48,499	17,541	13,674	524	8,721	22,918
2033	-10,600	58,066	44,581	0	0	34,267	13,199	47,467	17,134	13,485	537	8,633	22,655
2034	-10,600	57,120	43,796	0	0	33,522	12,998	46,520	16,761	13,324	550	8,563	22,437
2035	-10,600	56,256	43,069	0	0	32,842	12,814	45,656	16,421	13,187	563	8,511	22,261
2036	-10,600	55,466	42,393	0	0	32,221	12,645	44,867	16,111	13,074	576	8,473	22,124
2037	-10,600	54,741	41,760	0	0	31,651	12,489	44,141	15,826	12,980	590	8,450	22,020
2038	-10,600	54,077	41,171	0	0	31,131	12,346	43,477	15,566	12,906	603	8,439	21,948
2039	-10,600	53,469	40,621	0	0	30,655	12,214	42,869	15,327	12,848	616	8,439	21,903
2040	-10,600	52,909	40,104	0	0	30,216	12,093	42,309	15,108	12,805	629	8,448	21,882
2041	-10,600	52,387	39,614	0	0	29,809	11,978	41,787	14,904	12,773	642	8,466	21,881
2042	-10,600	51,909	39,155	0	0	29,435	11,874	41,309	14,717	12,754	656	8,490	21,899
2043	-10,600	51,461	38,718	0	0	29,085	11,776	40,861	14,543	12,743	669	8,519	21,931
2044	-10,600	51,035	38,296	0	0	28,754	11,682	40,436	14,377	12,740	682	8,553	21,975
2045	-10,600	50,631	37,888	0	0	28,438	11,593	40,031	14,219	12,743	695	8,591	22,029
2046	-10,600	50,567	37,845	0	0	28,387	11,580	39,967	14,194	12,722	695	8,576	21,994
2047	-10,600	50,516	37,810	0	0	28,347	11,570	39,916	14,173	12,706	695	8,565	21,966
2048	-10,600	50,477	37,783	0	0	28,315	11,562	39,877	14,157	12,693	695	8,555	21,943
2049	-10,600	50,450	37,766	0	0	28,293	11,557	39,850	14,146	12,684	695	8,546	21,925
2050	-10,600	50,468	37,784	0	0	28,305	11,563	39,868	14,152	12,684	695	8,540	21,919
2051	-10,600	50,468	37,784	0	0	28,305	11,563	39,868	14,152	12,684	695	8,540	21,919
2052	-10,600	50,468	37,784	0	0	28,305	11,563	39,868	14,152	12,684	695	8,540	21,919

**Table 13. Year-by-Year Comparison of GHG Emissions without Oakland Power Plant
Oakland Waterfront Ballpark District Project
Oakland, California**

Year ¹	Existing Conditions Emissions	Project 1.0 Operational Emissions ^{2,7}	Project 2.0 Operational Emissions ^{2,7}	Construction Emissions	Non-Residential Construction Emissions	Net New Emissions			Direct Local Reductions ⁶				
						Non-Residential Emissions ⁴	Residential Emissions ⁴	Total Emissions to Reduce or Offset ^{3,7}	Required Direct Local Offsets (50% of Non-Residential)	TMP + TDM + Onsite EV Charging ⁵	Electrification of 50% of Residential Units	751 Offsite Neighborhood EVCS	Total Direct Local Reductions
MT CO ₂ e/year													
2053	0	42,462	31,370	0	0	30,872	11,590	42,462	15,436	11,091	685	0	11,777
2054	0	39,040	28,336	0	0	27,468	11,572	39,040	13,734	10,704	570	0	11,274
2055	0	39,037	28,333	0	0	27,465	11,572	39,037	13,733	10,704	570	0	11,274
2056	0	38,992	28,300	0	0	27,465	11,527	38,992	13,733	10,692	570	0	11,262
2057	0	4,971	3,530	0	0	4,951	20	4,971	2,476	1,441	382	0	1,823
Total	-317,998	1,646,649	1,250,933	30,576	20,854	977,521	381,707	1,359,227	488,760	395,717	18,582	265,565	679,863
Maximum Allowable Offset Credits⁸ (50% of Total Emissions)								679,614	% Local Reduction Measures				70%

Notes:

- Emissions decrease over time due to transportation and electricity (for both building energy use and water treatment and distribution) becoming cleaner. A linear interpolation is used to take into account decrease in electricity intensity factor due to Renewable Portfolio Standards. The decrease in vehicle emission factors over time is based on Alameda County fleet-average emission factors from 2020-2050. The estimate assumes no change after 2050, since EMFAC2017 does not project past 2050.
- Emissions assume all buildings become operational as soon as Phase is constructed, based on percent of operational land uses by Phase and percent of operation per year. The first calendar year is adjusted for partial operation based on start date and the last calendar year is adjusted for partial operation such that total lifetime for each land use sums to 30 years.
- Net new emissions to reduce or offset include Existing Conditions Emissions, Project 1.0 Operational Emissions, Construction Emissions, and Backfill.
- Net new non-residential emissions include Existing Conditions Emissions, Project 1.0 Non-Residential Operational Emissions, and Backfill. A portion of the construction emissions corresponding to the percent of building square footage that is non-residential was included. The remainder of emissions are considered residential.
- This analysis assumes that 10% of onsite parking spaces will be equipped with an EV charger.
- The avoided GHG emissions quantified under Additional Local Reductions show a potential path to the required 50% local reduction under AB734 should the OPP Variant not be implemented.
- The analysis presented here does not include anticipated additional reductions from Project features associated with LEED Gold design or from local air quality mitigation measures with GHG co-benefits. The Project is committed to achieving LEED Gold Standard, which requires projects to obtain points in the areas of Location & Transportation, Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality, Innovation, and Regional Priority. Many of these measures, such as optimizing energy performance, demand response, and renewable energy production, would allow the Project to achieve further GHG reductions locally that are not captured in this analysis.
- Per AB734, up to 50% of the total net new emissions for the Project can be reduced with offset credits on the carbon market.

Abbreviations:

- CO₂e - carbon dioxide equivalents
- EVCS - electric vehicle charging stations
- MT - metric ton
- NPV - net present value
- yr - year

**Table 14. GHG Emissions Reductions from Local, Direct Measures
Oakland Waterfront Ballpark District Project
Oakland, California**

Potential Additional Emissions	Emissions	Units
Backfill Emissions per Attendee ¹	0.0037	MT CO ₂ e/backfill event/attendee

Location	Measure	Lifetime ² (Years)	Lifetime Emissions (MT CO ₂ e/Unit)	Unit
On-site	Solar Panels ³	30	1.4	MWh
On-site	Residences without NG ⁴	30	12	DU
On-site	Waste Diversion ⁵	30	15	ton diverted
On-site	Reduced On-Site Parking ⁶	30	1,024	100 spaces reduced
Off-site	Neighborhood EVCS ⁷	10	127	EVCS

Notes:

1. Backfill emissions per attendee were estimated by dividing the total annual emissions at the Coliseum stadium by 82 games per year with 35,000 attendees at each game.
2. On-site emissions reductions are assumed over a 30-year operational life. Off-site emissions reductions are assumed over a 10-year operational life, with the exception of Trees Planted, which assumes a 20-year growing period.
3. Methodology is consistent with Table OP-19. CO₂e emissions reductions were calculated for the lifetime starting with 2023. Since electricity emission factors decrease each year (see Table OP-12), the sum of the CO₂e emissions reductions over the lifetime and dividing by the electricity generation to obtain a relationship between MT CO₂e and MWh.
4. Methodology is consistent with Table OP-20. CO₂e emissions reductions were calculated by multiplying residential natural gas usage rate by the natural gas emission factor. CO₂e emissions associated with the electricity that will replace natural gas (40% increase) have been added back into the reduction.
5. Methodology is consistent with Table OP-5. The value for CO₂e emissions per unit is equal to the CO₂e emission factor for solid waste disposal.

**Table 14. GHG Emissions Reductions from Local, Direct Measures
Oakland Waterfront Ballpark District Project
Oakland, California**

Notes, Continued:

- ^{6.} Reduced on-site parking reductions are based on communication with Fehr & Peers on February 12, 2020, for every 500 on-site parking spaces removed from the project design, there would be 540 fewer trips for large events and concerts, 10,320 fewer miles travelled for weekday games, 10,920 fewer miles traveled for weekend games, and 8,890 fewer miles traveled for concerts. This reduction is capped at 2,000 spaces. Due to the complex nature of this analysis, Ramboll has evaluated these reductions for 100 spaces, which may not scale linearly when changing the number of spaces.
- ^{7.} Methodology is consistent with Table OP-22.

Abbreviations

- CO₂e - carbon dioxide equivalent
EVCS - electric vehicle charging station
DU - dwelling unit
EV - electric vehicle
MT - metric tons
MWh - megawatt-hour
NG - natural gas
ZEV - zero emission vehicle

**Table OP-22. Potential GHG Emissions Reductions from Installing Offsite Neighborhood EV Charging Station (EVCS)
Oakland Waterfront Ballpark District Project
Oakland, California**

Input parameters

Description	Assumption	Units
Years of emissions reductions included (assumed operating life of EVCS)	10	years
Annual Gasoline-Fueled Vehicle VMT Reduction per EVCS (PHEV) ¹	36,500	mi/yr/EVCS
Annual Gasoline-Fueled Vehicle VMT Reduction per EVCS (BEV) ¹	73,000	mi/yr/EVCS
Calculated Annual Gasoline-Fueled VMT Reduction per EVCS (mi/yr/charger) ²	54,750	mi/yr/EVCS
Fuel Economy of an EV (kWh/mile) ³	0.25	kWh/mi
Fuel Economy of an EV (MWh/mile)	0.00025	MWh/mi
Calculated MWh used per EVCS per year	13.69	MWh/yr/EVCS

Emissions Reductions from Offsite Neighborhood EVCS

Year	Emission Factors		Emissions per EVCS (MT CO ₂ e/yr/charger)		
	Non-Electric Passenger Vehicle ⁴ (g CO ₂ e/mi)	EVCS Emission Factor ⁵ (lb CO ₂ e/MWh)	Non-Electric Passenger Vehicle Emissions Reduced	Indirect EVCS Emissions	Net Reductions
2023	288	264	16	1.6	14
2024	280	252	15	1.6	14
2025	271	240	15	1.5	13
2026	263	228	14	1.4	13
2027	256	216	14	1.3	13
2028	249	204	14	1.3	12
2029	243	192	13	1.2	12
2030	238	180	13	1.1	12
2031	234	168	13	1.0	12
2032	230	156	13	1.0	12

**Table OP-22. Potential GHG Emissions Reductions from Installing Offsite Neighborhood EV Charging Station (EVCS)
Oakland Waterfront Ballpark District Project
Oakland, California**

Notes:

1. The annual VMT reduction per EVCS is based on Based on Table H1 of ARB's Electric Vehicle Charging Infrastructure: Multifamily Building Standards from 2019. Available at: <https://ww3.arb.ca.gov/cc/greenbuildings/pdf/tcac2018.pdf>
2. The estimated VMT reduction per EVCS is the average of the PHEV and BEV VMT reductions.
3. This is representative of a typical charge rate for an EV of 6.25 kWh per hour and a fuel economy of 0.25 kWh per mile. The charge rate is based on capability of existing battery-electric vehicles and Level 2 charging stations. Reference: Chargepoint. 2017. Level Up Your EV Charging Knowledge. Available at: <https://www.chargepoint.com/blog/level-your-ev-charging-knowledge/>. The fuel economy is based on National Renewable Energy Laboratory (NREL). 2018. California Plug-In Electric Vehicle Infrastructure Projections: 2017-2025 (Table C.1). Available at: <https://www.nrel.gov/docs/fy18osti/70893.pdf>.
4. The non-electric passenger vehicle emission factor was estimated using EMFAC2017 for Alameda county. Only gasoline light-duty passenger vehicles were included.
5. The EVSC emission factor is equivalent to the grid averaged electricity emission factor in Table OP-12.

Abbreviations:

BEV - battery electric vehicle
CO₂e - carbon dioxide equivalents
EVCS - electric vehicle charging station
kWh - kilowatt-hour
MMBTU - million British Thermal Units
MT - metric ton(s)
MWh - megawatt-hour

NO_x - nitrogen oxides
PGE - Pacific Gas & Electric
PHEV - plug-in hybrid electric vehicle
PM - particulate matter
ROG - reactive organic gases
VMT - vehicle miles traveled
yr - year

CITY OF OAKLAND



1 FRANK H. OGAWA PLAZA • 3RD FLOOR • OAKLAND,
CALIFORNIA 94612

Office of the Mayor
Libby Schaaf
Mayor

(510) 238-3141
FAX: (510) 238-4731
TDD: (510) 238-3254

February 28, 2020

Richard Corey
California Air Resources Board
1001 I Street
Sacramento, CA 95814
Dear Mr. Corey,

I write concerning the potential future of the Oakland Coliseum site, which includes the stadium and associated parking lots (the “Coliseum”). Today the Coliseum is the home field of the Oakland Athletics (the “A’s”) and the Oakland Raiders (the “Raiders”). The Raiders franchise is moving to Las Vegas next season, leaving the A’s as the only remaining tenant. As you know, the Coliseum was built in the early 1960s, with its first game held in 1966. As indicated in prior correspondence to you from us, the City of Oakland (the “City”) prepared a Specific Plan for the Coliseum City area in which it noted that the Coliseum was “obsolete” and would be demolished in the circumstance where neither the A’s nor the Raiders were anchor tenants. Once the Coliseum loses its anchor tenants, there may not be a steady revenue stream to support the ongoing maintenance and repair of this facility.

We understand that in association with the Howard Terminal Project (“Project”), in the event the Coliseum is not demolished immediately following the A’s departure, the California Air Resources Board (“CARB”) wishes to have a commitment regarding the potential use of the newly available dates in excess of the historical average of four non-sporting events per year at the Coliseum. By this letter, I confirm that the A’s have agreed and the City will enforce the following: if (1) the Project is approved and constructed, (2) the A’s leave the Coliseum, and (3) the Coliseum is not demolished, then for each year the Coliseum is not demolished and events exceed four per year, the A’s are required to fully reduce and offset, consistent with AB 734 requirements, all greenhouse gas emissions associated with events that are in excess of four per year. I understand that the Application provided by the A’s to CARB must identify a menu of reduction measures and their associated greenhouse gas reductions that the A’s may then select to reduce emission from these excess events in accordance with a process and methodology included in the Application and approved by CARB.

As you know, the City, as the lead agency charged with enforcing the obligations of the A's under AB 734, has agreed to monitor and enforce all obligations if the Project is certified by the Governor, approved, and constructed.

Please note that the City has no obligation to approve, and the A's have no obligation to develop, the Project unless and until the parties have negotiated, executed and delivered mutually acceptable agreements based upon information produced from the CEQA environmental review process and any other public review and hearing processes, subject to all applicable regulatory approvals. The City retains the absolute, sole discretion to (1) modify the Project as the City in its sole discretion deems necessary to comply with CEQA; (2) select other feasible alternatives and/or impose mitigation measures to avoid or reduce significant environmental impacts; (3) balance the benefits of the Project against any significant environmental impacts prior to taking final actions, if such significant impacts cannot otherwise be avoided; and/or (4) determine not to grant the requisite approvals for the Project.

Thank you for your consideration of this letter. Please do not hesitate to call if you have questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Libby Schaaf". The signature is fluid and cursive, with a large loop at the end.

Mayor Libby Schaaf

Cc:

Jared Blumenfeld, Secretary for Environmental Protection, State of California
Vice Mayor Reid, City of Oakland
Councilmember Taylor, City of Oakland
Supervisor Miley, County of Alameda
Supervisor Haggerty, County of Alameda

103772222.1