Dear Lafayette City Council, and Lafayette Environmental Task Force,

Please review this document with respect to the proposed Sports Field and Park at Deer Hill.

## MEASURE L: HEALTH RISK ASSESSMENT UNDERSTATES HEALTH RISK AT PROPOSED SPORTS FIELD AND PLAY AREA

The Yes on L campaign posted a report dated April 2018 written by Placeworks, the original SEIR consultant, that claims 'no significant risk' to children exercising and playing at the proposed Deer Hill Tot Lot and Sports Field, both of which are surrounded on three sides by heavy traffic. This 'Health Risk Assessment' was requested and paid for by O'Brien, the developer and major donor for Yes on L campaign. **The methodology is inaccurate in methodology and in omissions and the health risk to children understated by a large factor, large enough to change the outcome of the report.**

**SUMMARY**:

- Inaccuracy in methodology for PM2.5 Levels: Instead of using the 'PEAK RATE' of emissions which occur in the afternoon/evenings at this site for after school practices, the consultant used an 'ANNUAL AVERAGE' rate which is **25 times lower.**
- Inaccuracy in methodology for Cancer Risk: Instead of using the 'HIGH INTENSITY' breathing rate for active children on the Sports Field, the consultant used a 'STATIONARY' rate which **is 4 times lower**
- Omissions in methodology: The consultant never performed any active monitoring of the site.
- Omissions in methodology for Particulates: The consultant ignored ultrafine particulate matter which "penetrate deeply into lungs, bloodstream, and organs" per BAAQMD.
- Omissions in methodology: No part of the study included the adverse health effects of traffic on children, which include developing asthma[1], increased hospital trips for asthma[2], and increased ear, nose, and throat infections[3].

Fixing the inaccuracies in methodology, the Executive Summary Table should have been, with 4X the breathing rate for cancer risk, and 25X peak emission rates in evenings used in PM2.5 calculations for kids on fields after school (from Table D2a and Table D2b):

**Table ES-1 HRA Results – Refined Modeling**

| Source, Receptor | Cancer Risk (per million) | Chronic Hazard Index | Acute Hazard Index | PM 2.5 (ug/m3) |
|---|---|---|---|---|
| SR-24, Sports Field Receptors, 11-year exposure | 0.88 | 0.012 | 0.016 | 3.65 |
| SR-24 Park Visitor, worst-case 30-year exposure | 2.4 | 0.012 | 0.02 | 4.64 |
| BAAQMD Threshold | 10 | 1.0 | 1.0 | 0.3 |
| **Exceeds Threshold?** | **NO** | **NO** | **NO** | **YES** |

Fixing the inaccuracies in methodology, the CUMULATIVE ANALYSIS should have been, with 4X the breathing rate for cancer risk, and 25X peak emission rates in evenings used in PM2.5 calculations as applied to all of the surrounding roads as used for State Route 24:

**Table ES-2 HRA Results – Cumulative Analysis**

[1] https://www.ncbi.nlm.nih.gov/pubmed/20371422
[2] https://www.ncbi.nlm.nih.gov/pubmed/11908931
[3] https://www.ncbi.nlm.nih.gov/pubmed/12379553

| Source | Cancer Risk (per million) | Chronic Hazard Index | Acute Hazard Index | PM 2.5 (ug/m3) |
|---|---|---|---|---|
| State Route 24 | 2.36 | 0.012 | 0.016 | 5.0 |
| Pleasant Hill Road | 17.2 | 0.08 | 0.08 | 2.75 |
| Deer Hill Road | 16.0 | 0.08 | 0.08 | 2.75 |
| Mt. Diablo Blvd. | 2.8 | 0.08 | 0.08 | 0.5 |
| Shell Gasoline Station | 35.6 | 0.048 | 0.048 | n/a |
| Total Health Risk Values – all sources | 74.0 | 0.3 | 0.3 | 11 |
| BAAQMD Threshold | 100 | 10 | 10 | 0.8 |
| **Exceeds Threshold?** | **NO** | **NO** | **NO** | **YES** |

The Peak emissions used for PM2.5 are calculated in the Output Summary for Sports Field Receptors on page 55, and for the Park Receptors on page 69 of the report. When the PM2.5 values are calculated for the Sports Field on page 88, only the Annual Average Emission Rates and Annual Average AERMOD Output are multiplied to get the Annual Average MER Concentration.

For the kids at the sports field, it would be more representative and/or conservative, the 2 hours per day for 2 days a week would be calculated using the PEAK 1-Hour Emission and Peak 1-Hour AERMOD Output also on this page.
The difference for the Sports Field on page 88 changes the risk:

1.11e-1 x 1.528 = 0.17 ANNUAL AVERAGE using average emissions
1.03e-1 x 35.49 = **3.65** ANNUAL AVERAGE using peak emissions

For the kids at the Tot Lot during these same after-school hours, if the calculations were done on page 89 using the PEAK Hour Emission and Peak 1-Hour AERMOD Output, the risk changes to:

1.11e-1 x 1.834 = 0.20 ANNUAL AVERAGE using average emissions
1.03e-1 x 45.04 = **4.64** ANNUAL AVERAGE using peak emissions

The limit is 0.3 for both of these locations.

Note that the Annual Average increase in risk does occur at the Tot Lot, which is closer to Pleasant Hill Road and the freeway, and the kids at this site are younger and are at higher risk.

Given this extremely simple explanation for the results of the HRA being far lower than allowed does help explain why State Law and BAAQMD both do not recommend fields or schools being built at this site. When the analysis is done more accurately to reflect actual conditions at the site, it is clear that kids are going to be exposed to excess risk due strictly to the location of the Sports Field and Tot Lot. And the level of particulates at these locations during busy use hours is over 10X the allowed risk for both the Refined Modeling and Cumulative Analysis.

I cannot express how much of a long-term mistake it is to plan for a Sports Field and Tot Lot at this location. This HRA does not include ultrafine particulate pollution which are even more damaging to children. Please consider other healthy sites away from busy roadways.

-Susan Candell
Engineer
Resident of Lafayette, 5/13/2018


Background Information:

Some facts: Vehicle trip per day: Pleasant Hill Road (PHR) 36,000, Deer Hill Road (DHR) 12,200, Hwy 24 186,000. The Sports Field would actually be 50 feet from DHR, 200 feet from PHR, about 400 feet from the freeway onramp, about 700 feet from the freeway lanes; the Tot Lot about 160 feet from PHR, about 400 feet from the freeway onramp, about 800 feet from the freeway.

The anticipated use of the sports field includes afternoon practices, typically 3 to 6 pm when PHR, DHR and Hwy 24 have major backups.

Consultant's report assumes users "stood outside" at the sports field for 2 hours (p.17) and refers to (p.5) a 2015 Office of Environmental Health Hazard Assessment (OEHHA) manual for 8 and 24 Hour exposures based on Sedentary, Passive, Light Intensity, Moderate Intensity Activities for male and females combined and takes a 99 percentile figure (p.4). This table does NOT include High Intensity Activities for children. The 99 percentile 24 hour inhalation rate is 20 cubic meters/day or **.83 cubic meters/hr**. Using this and its ESTIMATE of local sources of air pollution (instead of actual monitoring data), and averaging nighttime hours when traffic low and field not in use, the consultant presents a figure equivalent to .44 micrograms/cubic meter for particulate matter of 2.5 microns (PM 2.5) (p.18). Two hours a day use is assumed.

However, children will be running, not standing. OEHHA evaluates health risks to children under the SB 352, Education Code 17213 School site law, in its Technical Support Document for Exposure Assessment 2012. Its “One Hour Breathing Rate for SB 352 School sites” for "High Intensity Activities", Table 3.4b, for 6 to 11 year olds, 95th percentile, is **3.51 cubic meters/hr**. This is **FOUR TIMES** the inhalation rate used by consultant. That rate is based upon “Play outdoors” and “Recess and physical education”, table 3.26, which is equivalent to the anticipated sports field use of soccer practice and sports.

Consultant ESTIMATED PM 2.5 exposure for field users to be equivalent to an increase of **0.44** micrograms/cubic meter (p.18). To put this perspective, this equals an increase Air Quality Index (AQI) of 1 on a scale of 1-300, not plausible for a roadway corridor location and at the extreme top end of the Good category (AQI 0-50). Developer’s calculation equals **less than 1/100th of the BAAQMD's Concord** (near Treat Blvd and Oak Grove) PM 2.5 Jan 2018 reading of AQI 145, which is **53.3** micrograms/cubic meter, and **less than 1/60th** of Concord's Feb Moderate AQI reading of 81 and **28.3** micrograms/cubic meter. (conversions per sparetheair.com AQI Calculator).

**ULTRAFINE PARTICULATE MATTER (UFP)**. The consultant ignored Ultrafine UFP. Note the difference between PM 2.5 (particulates of 2.5 microns in size) and smaller ULTRAFINE PM less than 0.1 that penetrates through the lungs, into the blood, cells, through the brain/blood barrier, accordingly to multiple reputable sources. In the Bay Area Air Quality Management District (BAAQMD) May 2016 Planning Healthy Places p.4: ["VERY SMALL PARTICLES (LESS THAN 2.5 MICRONS IN DIAMETER) THAT CAN TRAVEL DEEP INTO THE LUNGS AND ENTER THE BLOODSTREAM..."; "ULTRAFINE PARTICLES (UFP) ...PENETRATE DEEPLY INTO LUNGS, BLOODSTREAM AND ORGANS."]. From the South Coast Air Quality Management District document in 2012 regarding the Near Roadway Exposure and Ultrafine Particles ["Cumulative deficits in the growth in lung function during the eight-year study period resulted in a strong association between exposure to air pollution and a clinically low [forced expiratory volume] at the age of 18 years...Children are among the most susceptible segment of the population affected by exposure to traffic related pollutants. Their immune, neurological, and respiratory systems are still under development, they typically spend a substantial amount of time playing outdoors, and they have higher breathing rates per body mass. Neighborhood exposure to traffic-related air pollution has been linked to increased medical visits and hospital admissions for childhood asthma, increased wheezing and bronchitis, and the development of new asthma cases"].

Also please refer again to the presentation by Mr. James Leach of Sustainable Lafayette, recipient of the 2018 Lafayette Award of Environmental Excellence (who is not affiliated with either side of the Measure L debate) now available online at https://youtu.be/bnEFj9xJmQ8. Mr. Leach advised the Lafayette city council on 4/2: "My objection to constructing a sports field and play area at the Deer Hill project is that the level of air pollution close to Hwy 24, Pleasant Hill Road, and Deer Hill Road is unhealthy for such activities. These conditions are especially hazardous to children. Exposure to so much auto emissions causes respiratory and cardiovascular diseases, various cancers and developmental disorders."

## CONCLUSION

There is no reasonable doubt that exposure to PM 2.5 and Ultrafine PM and associated pollutants at the proposed children play area and sport field, located 50 to 200 feet from congested roadway corridors on PHR and DHR, and near Hwy 24, will expose children to short and long term health risks. The city and developer have not managed this analysis properly, either at the time of the Homes EIR or in deciding on a June election on Measure L. The legal restrictions on school sites and their fields in such an area, recommendations of the BAAQMD, and the body of medical information available should be heeded. This project should not have been put before the voters without active long term onsite monitoring of PM and a comprehensive and thorough analysis of these health risks. It is unconscionable that we embark on a project that may place the health of children in our community at risk in this imprudent and reckless manner.