

February 28, 2022

To: Marion Hoyer
Environmental Protection Agency
Office of Transportation and Air Quality (OTAQ)

Michael Regan
Environmental Protection Agency
Administrator

cc: Brian Q. Armstrong
FAA, Western-Pacific Region
Manager, Airport Safety and Standards Branch

From: Michael McDonald
Pilot at Reid Hillview (RHV) airport in Santa Clara County, California
Santa Clara County Airport Land Use Commission Proxy Member (volunteer)
Angel Flight pilot

Re: Aviation Lead Study at Reid Hillview Airport

To the EPA Leadership:

I have been extensively involved in the efforts to bring unleaded aviation fuel (“AvGas”) to Reid Hillview (“RHV”) airport, and thereby to unlock the opportunity for unleaded aviation fuel use by numerous other airports in California and the west coast. As a pilot and member of the class most highly exposed to lead, my interest is and was to make aviation safer for the community, my passengers, and me. Like virtually everyone in the aviation community, I believe the switch to unleaded aviation fuel is overdue; it is time for the FAA to act.

That being said, the motive for Santa Clara County (“County”) is to close an airport and thereby reap a quick financial windfall for the county. They have dressed up their financial motives with a pretext of health concerns for the marginalized. Unfortunately, the County has manufactured a crisis to advance their political agenda and financial ambitions. Sadly, their political and financial resources provide them a powerful megaphone to now advance maligned “facts” about aviation fuel.

Even worse, **by spreading misleading information about the impact of aviation fuel, the County needlessly creates unwarranted concerns for all families living near airports and undeservedly devalues all communities near airports.** They are not helping these communities as they profess; they are hurting them and redirecting scarce health resources in the wrong direction.

As a professional engineer, I think it is incumbent that the facts are correct and known, so that the best decisions can be made. Good decisions are not made based on a biased presentation of incomplete facts and half-truths as the County has regrettably done. Furthermore, risks and rewards should be understood and weighed against each other when making decisions; indeed, by attacking RHV – and by

extension many other small general aviation airports – the County undermines all of aviation and the good that comes with it. Indeed, it is my strong belief that supporting aviation supports the community.

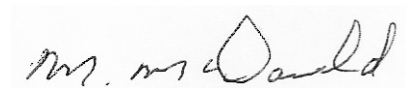
This letter is intended to identify and correct the record on some of the claims made by the County regarding lead. This letter does not address FAA grant assurance issues with the County which I have separately addressed with the FAA. Nor does it explore the economic impact of general aviation and what the closure of RHV could economically mean to the region; more information on that is also available upon request.

This letter focuses specifically on lead research from Santa Clara County that has been sent to the EPA. A summary of the short-comings of that research is presented, followed by a more extensive review of these issues.

It is important that the EPA get the analysis on aviation fuel right to ensure constrained health care resources are properly allocated; at the same time, it is also important that communities are notified of the true risk, to decrease possible misclassification of children and unnecessary concern by parents.

I ask that the EPA thoughtfully consider and evaluate these issues in identifying next steps regarding the transition to unleaded AvGas; I applaud this ultimate goal.

Respectfully,

A handwritten signature in black ink that reads "Mr. McDonald". The signature is written in a cursive style with a large, looped "M" and "D".

Michael McDonald
Community and Airport Partnership for Safe Operation (CAAPSO) Board Member
Santa Clara County Airport Land Use Commission (ALUC) Member
Angel Flight Pilot

Summary

The County took actions on January 1, 2022, that prohibited the sale of leaded AvGas at County-owned airports. These actions were ostensibly taken based on the results of a study (“Study”) that the County commissioned to evaluate the potential impact of AvGas on blood lead levels (“BLLs”) at RHV.¹

If correct, the Study found that there is a correlation between leaded AvGas sales at RHV and child BLLs; an increase in one will increase the other. Just as importantly, the converse applies: if leaded AvGas sales are eliminated, child BLLs will not be elevated. As the County has eliminated leaded AvGas sales at the airport, the concern by the County that the airport and airplanes elevate BLLs is no longer relevant as leaded AvGas is no longer sold by virtue of the County’s actions.

If correct, the Study results also show that no special action is needed. As opined by a Yale University School of Medicine physician and researcher who provided a peer review of the Study, “this finding is not a crisis” and there are “some important differences” to the Flint, MI crisis. The CDC provides a BLL reference value of 3.5 micrograms per deciliter ($\mu\text{g}/\text{dL}$) for case management; this level represents the worst 2.5% of the population’s BLL levels and prioritizes this population for medical and environmental follow-up; below this level, physicians take no action. The Study found the mean level for those located closest to the airport was 1.93 $\mu\text{g}/\text{dL}$, which is below the current CDC reference value and far below the CDC reference values – 5 $\mu\text{g}/\text{dL}$ and 10 $\mu\text{g}/\text{dL}$ – in effect during the time period covered in the Study. Furthermore, those in the Study above the CDC reference value represented only 1.7% of the population, which is less than the 2.5% benchmark set by the CDC.

However, it should be noted that the data used in the Study is fundamentally flawed, and so the Study itself should be questioned. BLL testing equipment was developed in the 1990s to detect elevated BLLs above 10 $\mu\text{g}/\text{dL}$. With the substantial reduction of community BLLs since that time, this equipment is inadequate to accurately and precisely test at current BLLs; this is a limitation recognized in the industry. The Study assumes a precision and accuracy in the data that unfortunately is not supported by the equipment used to do the test.

Some of the assumptions, techniques, and conclusions in the Study also deserve scrutiny.

- (1) The Study’s selection of the epicenter of lead deposits at the northwest end of the field versus the southeast end is inconsistent with prior research; given the Study’s conclusions on impacts to communities within 0.5 miles of the airport and those downwind from the aircraft, correctly identifying the epicenter of lead deposits 3000’ to the southwest may have a profound impact on results, as well as indicate a lower risk for many children and schools.
- (2) The Study assumes no lead-based paint was used in homes built after 1960; this is inconsistent with reality, as well as the County’s own position (based on lawsuits) and California state law, all of which say that lead may exist in any California home built before 1978.
- (3) The Study does not explore the potential contribution of major lead sources that were prevalent immediately around RHV for decades: (1) lead-arsenate, the leading pesticide used in the local orchards surrounding the airport, (2) legacy automotive leaded gas used at the NASCAR race

¹ “Leaded Aviation Gasoline Exposure Risk at Reid-Hillview Airport in Santa Clara County, California,” Mountain Data Group, August 3, 2021.

- track directly adjacent to RHV, (3) legacy automotive leaded gas from the major road arteries of Tully Rd and Capital Expressway that intersect adjacent to RHV, and (4) lead pipes and fixtures.
- (4) The Study ignores that communities south (downwind) of the airport had the lowest BLL, and instead focused on the communities east (also downwind) of the airport that had higher BLL; the former goes against the County's thesis.
 - (5) The Study's researcher explored but did not include a correlation of BLL to *actual* lead measurements from an EPA-required air emissions lead meter that is at RHV; it is concerning that potentially contradictory results were omitted from an "unbiased" scientific Study.

Independent analysis of lead levels should also be considered, especially where they provide a contradictory result. At my request, the Bay Area Air Quality Management District (BAAQMD) provided EPA-mandated lead measurements for RHV from January 2016 through 2021; these levels were substantially better than EPA National Acceptable Air Quality Standards (NAAQS). Further highlighting that this is not a true crisis, BAAQMD indicated it intends to petition the EPA to discontinue testing based on the low lead levels found at RHV.

The County position that all lead must be eliminated is a good soundbite and admirable goal, but is an extreme position, economically impractical, and the risk/reward ratio does not support it. Some of the largest contributors to the world's economy permit small levels of lead; these products include automotive gasoline (lead, as a natural byproduct of petroleum, is permitted in automotive fuel), conventional vehicle batteries, and cell phones, among many other things. Simply put, fully eliminating all lead would, for starters, shut down transportation, anything that requires transportation, and billions of cell phones.

The County actually has an opportunity to validate the research, but has been unwilling to do so, further highlighting their specious health arguments. The Study indicates that BLLs should go down with the County's actions to stop the sale of unleaded fuel; this can now be validated ... a positive correlation would show that the County's actions have reduced BLLs in the community, and a negative correlation would indicate that aviation did not lead to an increase in BLLs. Both results would be positive for the community, but neither align with the County's political agenda of closing the airport and so aren't being pursued. In addition, while the County is now conducting additional lead studies of RHV, they refuse to include a forensic analysis of the source of the lead which would serve to better target the real sources of lead and more effectively use constrained health budgets; their lack of interest in this highlights a political – and not a health – agenda. If their real interest was community health, they should have supported these research opportunities.

In addition, the EPA should consider the economic and practical impact of closing airports due to lead contamination. For example, if excavation is desired down to three feet, a one acre parcel would require the removal of 12 million pounds of soil; as RHV is 180 acres, it would be necessary to remove nearly 2.2 billion pounds of soil. While capping is another solution, it requires massive amounts of clean dirt and is also not a permanent solution. As there are thousands of general aviation airports near communities, the economic expense of the EPA's decision may be tremendous.

Finally – and, frankly, unrelated to lead – I wish to make clear the life-saving services that will be eliminated if an adverse EPA or FAA decision closes small airports and keeps small airplanes from flying. General aviation airports like RHV – including Santa Monica, Palo Alto, and San Carlos and numerous other airports under specious attacks – and small airplanes play a vital role in providing thousands of

annual "Angel Flights," whereby individuals with illnesses are flown in to receive life-saving treatments. The certain health crisis and economic hardships these individuals will face must be considered in any actions of the EPA.

Details of these points will now follow.

County's Actions Eliminating Leaded AvGas Substantially Eliminates the Risk

If correct, the Study found that there is a correlation between leaded AvGas sales at RHV and child BLLs; an increase in one results in an increase in the other.² Just as importantly, the converse applies: if leaded AvGas sales are eliminated, child BLLs will go down.

Figure 13: Aviation Gasoline Sales at Reid-Hillview Airport and Child BLLs

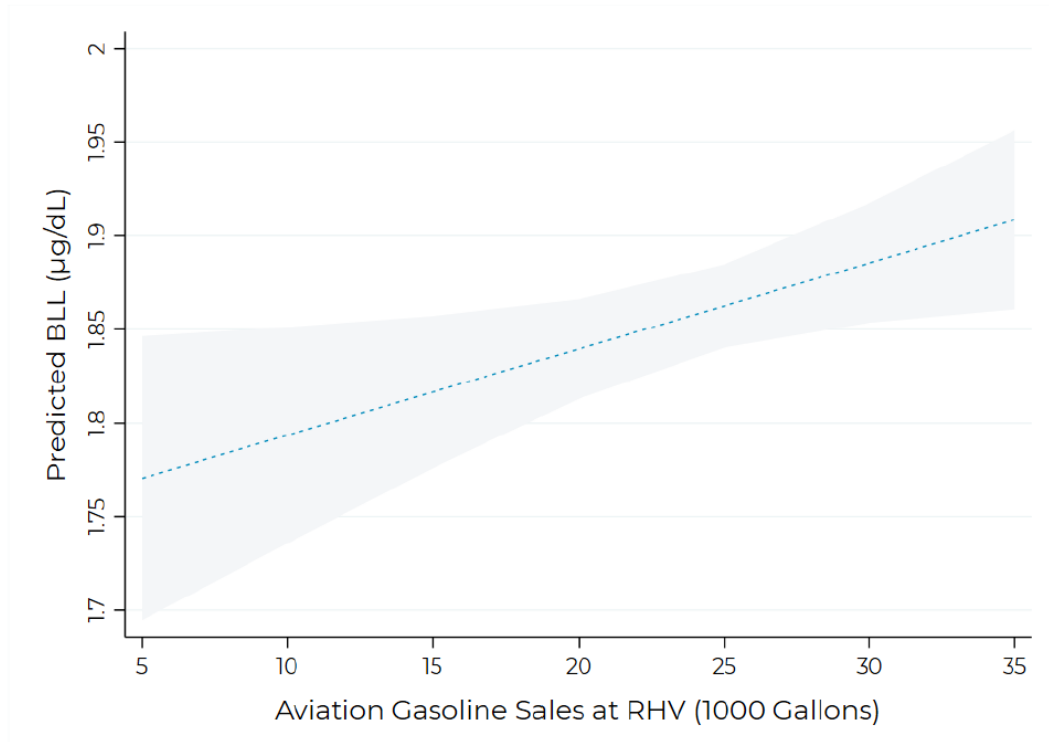


Figure 1 Aviation Gasoline Sales at Reid-Hillview Airport and Child BLLs (page 46)

As the County has eliminated leaded AvGas sales at the airport, AvGas aviation sales at RHV are, by definition, zero. As stated in the report,

the estimated positive association between child BLLs and PEA [piston engine aircraft] traffic is robust to the substitution of PEA traffic for the quantity of aviation gasoline sold at Reid-Hillview Airport, an analogous and independent indicator of lead exposure. The size of the estimated increase in child BLLs in going from the minimum to maximum PEA traffic exposure is on par with the increase in child BLLs caused by failures in the water system during the FWC [Flint Water Crisis].³

Specifically, the Study found that the difference between the observed maximum to the minimum is associated with a decrease in 0.18 µg/dL. The County has eliminated leaded AvGas sales, so the

² Mountain Data Group, (46).

³ Ibid.

predicted BLLs are now 0.18 µg/dL less. Therefore, there is now no need to close the airport because of a concern over lead exposure.

The County will possibly argue that some aircraft continue to use leaded fuel from elsewhere and therefore the risk remains. Importantly, that was also the case during the Study, as numerous aircraft departing RHV purchase their fuel at other less expensive locations. The Study also only made estimates down to 5000 gallons in annual sales; the County has effectively brought that down even further, enabling even lower BLLs than shown in the Study.

Blood Lead Levels Found Near RHV are not Actionable nor a Crisis

If correct, the Study results also show that no special action is needed. This is a manufactured crisis of the County's own making.

As opined by Dr. Mark Cullen, a Yale University School of Medicine Physician and Researcher, who did the County's peer review of the Study,

[T]his finding is not a crisis. Although reference is made in the report to the debacle in the Flint drinking water several years ago, and the incremental lead effect is quantitatively similar, there are some important differences. The population impacted is relatively small, the impact is seasonal, and most importantly, only 1-2% of the measured levels, even with the attributable exposure, reached the "action level" for removal from exposure if I understood correctly. While the view that no level of exposure is safe is currently the predominant view among experts, there remains debate about how steep the effect on IQ is in the very low range, which is the basis for the cost estimate in terms of impact on lifetime earnings of the "airport effect"... I am also mindful of the risk that the airport could become an undue focus of community anxiety about health, when there may be better targets for this energy in the pandemic era.⁴

to which Dr. Zahran, the author of the Study, replied:

*Finally, with respect to Dr. Cullen's assessment of the implications of reported results, **we agree fully with the spirit of his remarks that one must be judicious in the allocation of scarce resources in attending to questions of population health and welfare. We agree with all of his distinctions between the Flint Water Crisis – that we use to contextualize the meaning of observed "airport" effects throughout – and exposure to lead-formulated aviation gasoline at RHV.***⁵

Sadly, Dr. Cullen's prediction that this could become "an undue focus of community anxiety" has been exacerbated by the County's own actions; **the County consistently incorrectly compares this to Flint knowing full well this creates a community anxiety that can be leveraged to close the airport.**

A little more explanation on why this is not a crisis. The national CDC currently provides a BLL reference value of 3.5 µg/dL for case management; during the period of the study, this CDC BLL reference value was 10 µg/dL (2011) and 5µg/dL (2012 through May, 2021). This reference value represents a threshold of the worst 2.5% of the population's BLL levels and prioritizes this population for medical and

⁴ ["Response to External Reviews of Leaded Aviation Gasoline Exposure Risk at Reid-Hillview Airport in Santa Clara County, California"](#), Mountain Data Group, August 13, 2021 (p. iii).

⁵ Ibid, (p. v).

environmental follow-up; below this level, physicians take no action aside from general education. As everyone in society has a positive BLL, this reference level enables physicians to prioritize those at highest risk and similarly allows those under this threshold to not be unduly concerned (or terrorized by the County, in this case).

The Study found the mean level for those located closest to the airport was 1.93 µg/dL, which is below the current CDC reference value and far below the CDC reference values – 5µg/dL and 10 µg/dL – in place during the Study’s timeframe. In other words, for the average child living closest to RHV, they should NOT be concerned; they do not have an actionable BLL.

At the high end, the Study found that about 1.7% of the population had a BLL in excess of 4.5 µg/dL⁶; this is less than the 2.5% benchmark set by the CDC. Put differently, of the 17,162 people tested over the 10 years of the Study, 1.7% is roughly 29 children annually with an elevated BLL.⁷ The County estimates that 12,805 children live within the Study area⁸; 29 children annually is therefore **roughly 0.2% of the children living within 1.5 miles of the airport that apparently have an elevated BLL.**

This is clearly not a community crisis.

With respect to the County’s constant misleading and incorrect refrain in the press and to government agencies that the “RHV lead exposure is worse than the Flint Michigan lead crisis”: the Study explicitly indicates that the switch in water source in Flint caused child BLLs to increase by about 0.35 to 0.45 µg/dL from a pre-crisis baseline of about 2.3 µg/dL.⁹ In contrast, aviation lead at RHV contributed far less than Flint, MI and had a baseline of far less than Flint, MI; shown below are the actual results of the Study.¹⁰

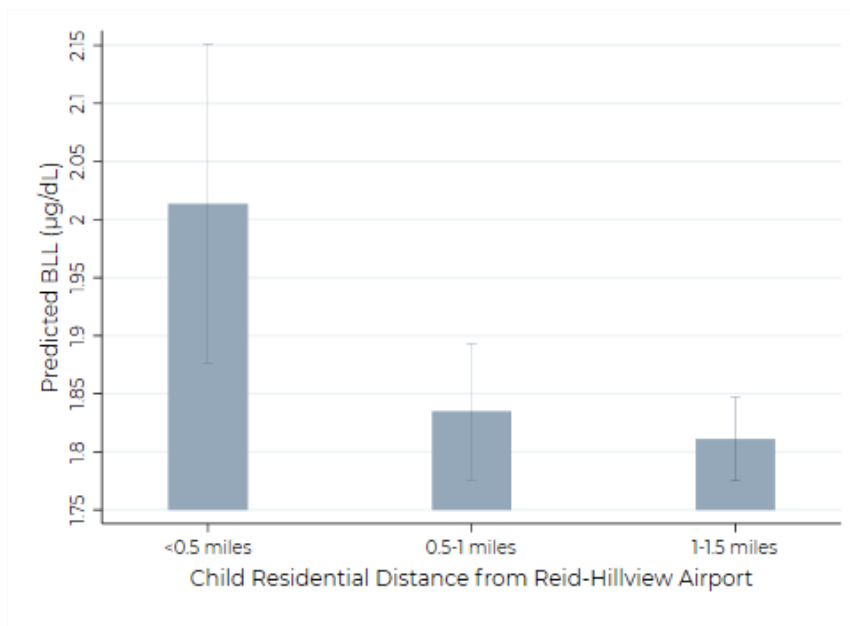
⁶ Mountain Data Group, (p. 10)

⁷ Mountain Data Group, (p. 34). In the County’s January 11, 2022 response to the FAA, the County incorrectly indicated that 300,000 records - not 17,162 - were used in the Study.

⁸ [Santa Clara County response to the FAA, January 11, 2022](#). (p. 4)

⁹ Mountain Data Group, (p. 37)

¹⁰ Mountain Data Group, (p. 36)



While the claim may be true in terms of percentage increase, they do not appear true in terms of actual numbers.

Study Concerns: Relies on Equipment Performance that Does Not Exist

With the substantial reduction of community BLLs, BLL test equipment is inadequate to accurately and precisely test at the levels found in the Study.

BLL testing equipment was developed in the 1990s to detect elevated BLLs above 10 µg/dL.¹¹ The current United States regulatory limits for BLL testing were set more than 25 years ago, at ± 4 µg/dL or 10% of the target value, whichever is greater.¹² Most laboratories can achieve a performance of at least ± 2 µg/dL at low blood Pb levels.¹³ The current US criteria mean a BLL sample of 5 µg/dL could be reported within a range from 1 to 9 µg/dL, and still be considered correct. As the report explicitly states, “This makes interpreting patient blood Pb test results uncertain at low levels.”¹⁴

This is a limitation recognized in the industry:

Accuracy and precision may be insufficient to quantitate low blood Pb levels in the 1–5 µg/dL range, which is essential now that the CDC blood Pb reference value is 3.5 µg/dL¹⁵

The Study assumes a precision and accuracy in the data that cannot be accomplished with today’s equipment.

¹¹ [“Determination of lead in blood by graphite furnace atomic absorption spectrometry with Zeeman background correction: Improving a well-established method to support a lower blood lead reference value for children”](#), Spectrochimica Acta Part B: Atomic Spectroscopy, 2021.

¹² ibid

¹³ ibid

¹⁴ ibid

¹⁵ ibid

As an example, the FDA-approved Magellan Diagnostics family of BLL testing equipment – including LeadCare II, LeadCare Plus, and LeadCare Ultra – is commonly used in nontraditional laboratory settings such as federally funded Women, Infants, and Children clinics, other health clinics, physician office labs, schools and mobile health units. In 2013, the LeadCare II was the only point-of-care instrument available in the US; it has a reportable range of 3.3 to 65 µg/dL, which lies outside of the average range found in the Study.^{16, 17}

A different example is the Magellan DX LeadCare Plus, that allows measurements down to 1.9 µg/dL but has a standard deviation of 0.49 over multiple runs when testing around a mean BLL of 3.1 µg/dL (the lowest number that they cite).¹⁸

The CDC issued a recall on all Magellan Diagnostics BLL equipment on July 2, 2021, due to inaccurate readings, further underscoring the potential lack of accuracy and precision of the data used in the Study.¹⁹

Very precise and accurate laboratory equipment such as graphite furnace atomic absorption spectrometry (GFAAS) also have significant errors in precision and accuracy at these low levels. Shown below is a table showing two such devices; the NIST known-levels are compared to the outputs of the two devices. Note specifically the errors for measurements at 1.48 µg/dL, which most closely coincides with the levels found in the Study: one machine returned a value of 1.4 ± 0.3 µg/dL (meaning 1.1 to 1.7 across multiple tests), while another one returned a value of 1.6 ± 0.4 µg/dL (meaning 1.2 to 2.0 across multiple tests).²⁰

These are high-precision devices that exceed FDA standards and requirements; they are the benchmark for the more commonly used BLL testers such as those from Magellan Diagnostics (note lower portion of Figure 2). It is simply exceedingly difficult to accurately and precisely measure differences that are in the single-digit parts-per-billion range, which is what is called for when measuring sub-1 µg/dL differences as is done in the Study.²¹

PRECISION

The precision of the LeadCare Plus Blood Lead Testing System was determined by testing samples at six concentration levels over twenty days. The results are provided below.

Mean µg/dL	Within Run		Total	
	SD	%CV	SD	%CV
3.1	0.44	14.1%	0.49	15.6%
5.1	0.44	8.5%	0.50	9.6%
11.7	0.64	5.3%	0.71	6.0%
24.7	0.80	3.2%	1.00	4.0%
45.4	1.61	3.5%	1.71	3.7%
59.1	1.89	3.2%	2.42	4.0%

ACCURACY

The accuracy of the LeadCare Plus Blood Lead Testing System was determined by a Method Comparison study. A total of 169 samples spanning the analytical range of 1.9-65.0 µg/dL were compared to GFAAS.

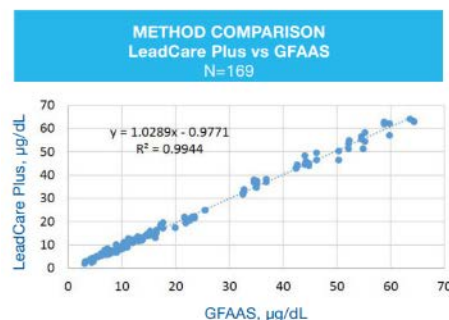


Figure 2 LeadCare-Plus Precision and Accuracy

¹⁶ <https://www.magellandx.com/leadcare-products/leadcare-ii/support/product-specifications/>

¹⁷ “Guidelines for Measuring Lead in Blood Using Point of Care Instruments,” Advisory Committee on Childhood Lead Poisoning Prevention Of the Centers for Disease Control and Prevention, October 24, 2013.

¹⁸ [LeadCare-Plus brochure](#). Magellan Diagnostics, 2018.

¹⁹ <https://www.cdc.gov/nceh/lead/news/potential-shortage-of-test-kits-following-recall.html>

²⁰ Spectrochimica Acta Part B: Atomic Spectroscopy, 2021.

²¹ 1 µg/dL = 10 parts per billion

Table 1. Analysis of NIST SRMs for blood Pb on the PE AAnalyst 600 and PE PinAAcle 900Z.

Standard reference material	Certified value ($\mu\text{g}/\text{dL} \pm U_{\text{SRM}}^{\text{a}}$)	AAnalyst 600 mean ($\mu\text{g}/\text{dL} \pm U_{\text{MEAS}}^{\text{b}}$)	PinAAcle 900Z mean ($\mu\text{g}/\text{dL} \pm U_{\text{MEAS}}^{\text{b}}$)
NIST 955c- Level 1	0.424 ± 0.0011	0.4 ± 0.3	0.5 ± 0.2
NIST 955c- Level 2	13.950 ± 0.080	13.8 ± 1.0	14.1 ± 0.9
NIST 955c- Level 3	27.76 ± 0.16	26.8 ± 2.5	27.4 ± 2.0
NIST 955d- Level 1	1.480 ± 0.026	1.4 ± 0.3	1.6 ± 0.4
NIST 955d- Level 2	4.947 ± 0.085	4.7 ± 0.6	5.1 ± 0.4

Figure 3 Analysis of NIST reference material for BLL on the PE AAnalyst 600 and PE PinAAcle 900Z. Source: *Spectrochimica Acta Part B: Atomic Spectroscopy*, 2021

Study Concerns: Used Incorrect Epicenter

The Study identifies the epicenter of lead deposits as the northwest end of the field, at the far end of runway 31 (as opposed to its beginning); based on prior research, this was incorrect and potentially fundamentally changes the outcome of the Study. By placing the epicenter 3000' to the southwest – at the beginning of runway 31 and near the run-up area – this relocates distances in the study by over 0.5 miles.

Given the importance of 0.5 miles distance in the Study, this is a major change. Within 0.5 miles downwind of this new location is primarily Eastridge Mall and its parking lot; many kids and schools thought to be within the critical 0.5 miles of influence now fall outside of it. Locations that were thought to be downwind are now upwind. Specifically, Meyer Elementary becomes upwind instead of downwind and moves from 0.1 mi to 0.6 mi; Kathy Smith Elementary becomes crosswind instead of downwind; and a fair number of schools and children move from out of the 1.5 mile area of interest around RHV.

In a study prepared for the US EPA in January 2010, the climb-out emitted 32.7% of the emissions; the climb-out is where the epicenter in the Study is located. The other modes of operation – or 67.2% of the emissions – occur downwind of the Study's epicenter.²²

²² [“Development and Evaluation of an Air Quality Modeling Approach for Lead Emissions from Piston-Engine Aircraft Operating on Leaded Aviation Gasoline,”](#) ICF International and T&B Systems for the US EPA, January 2010.

Table 4-8. Pb Emissions (kg/yr) by Aircraft Mode (2008) at SMO

Mode	Lead Emissions (%)
Taxi To Runway	20.4 (17.6)
Run-up	13.5 (11.4)
Takeoff Roll	10.0 (8.4)
Climb-out	37.9 (32.7)
Approach	17.9 (15.8)
Landing	9.4 (7.9)
Taxi to Apron	9.5 (8.4)

Figure 4 Pb Emissions (kg/yr) by Aircraft Mode (2008) at Santa Monica in EPA study

These regions, assuming typical prevailing winds (i.e. favoring operations on runway 31R/31L) are depicted on RHV below. As can be clearly seen, only a portion of the climb-out is near the epicenter identified in the Study; the majority of lead emissions occurs downwind of this location.

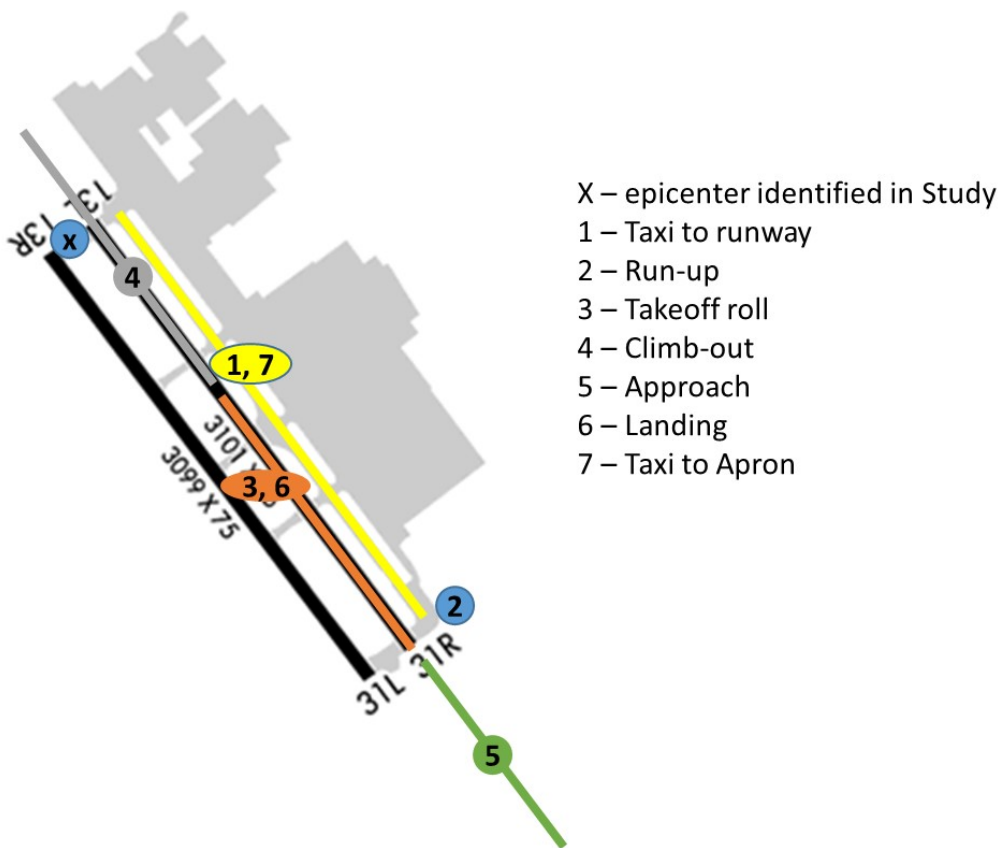


Figure 5 Various modes of flight as it pertains to Reid Hillview airport

It is therefore not surprising that the Bay Area Air Quality Management District (BAAQMD) performs its EPA-mandated airport lead testing at “2”, adjacent to the runup and downwind from the majority of lead emissions; this is the opposite end from where the Study identifies the epicenter of lead exposure.

Study Concerns: Used Incorrect Lead Paint Cut-off Date

The Study assumes no lead-based paint was used in homes built after 1960; this is inconsistent with the EPA’s recommended cut-off date, the County’s own position (based on lawsuits against paint

companies) and California state law, all of which say that lead paint is presumed in all California homes built before 1978.^{23, 24, 25}

Study Concerns: Did Not Adequately Explore Relevant Alternative Sources

The Study lacked any meaningful analysis of critical potential sources of lead in the area surrounding the airport. These include the following:

- **Lead Arsenate**

RHV was surrounded by orchards. The Emma Prusch Park is an example historical orchard still in existence and is less than 1 mile away from RHV. Many of the schools within 1 mile of RHV are within a similar distance to this orchard; these schools are also downwind from the orchard.

Lead Arsenate was a routine orchard pesticide used in Santa Clara County since the 1800s through the 1940s; it was finally banned in August 1988.²⁶ Farmers liked the “long-lasting” properties of the pesticide; it is that same persistence that is causing environmental problems decades after its use has ended.²⁷

Lead arsenate poisoning from orchards can have a significant impact on a community. Barber Orchard in North Carolina is an example of an EPA superfund site that was caused by lead arsenate pesticide used in former orchards.²⁸ The EPA required nearly 15 years to remediate this site before it could be reused.

As the CDC points out, “people who live near busy highways or on old orchard land where lead arsenate pesticides were once used can be exposed to higher levels of lead.”²⁹

Despite the orchards in the area, lead arsenate was not considered in the Study.

- **Legacy Automotive Fuel – Racetrack**

RHV was adjacent to the “NASCAR West” motor speedway, a NASCAR sanctioned track that operated from 1954 until it closed on September 3, 1977; it had weekly races.



Figure 6 Reid Hillview airport adjacent to the oval NASCAR racetrack

²³ “Protect Your Family From Lead in Your Home,” EPA, September 2013.

²⁴ “Experts, Federal Agencies, Physician Associations, and the Public Entities Agree That Lead Paint Is the Primary Source of Lead Exposure for Young Children Living In Pre-1978 Housing” was one section in the state decision “THE PEOPLE OF THE STATE OF CALIFORNIA, Plaintiff, vs. ATLANTIC RICHFIELD COMPANY” and others (Case No.: 1-00-CV-788657)

²⁵ California Department of Public Health, TITLE 17, Division 1, Chapter 9, Article 2, §37100 (a)(3).

²⁶ “[Current Conditions Report Hazards and Hazardous Materials Envision San Jose 2040 General Plan Update](#)”, February 12, 2010. (p. 9)

²⁷ A nice review of lead arsenate may be found in “[The apple bites back: claiming old orchards for residential development](#).” Environmental health perspectives vol. 114,8 (2006): A470-6. doi:10.1289/ehp.114-a470

²⁸ <https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0406989>

²⁹ https://www.atsdr.cdc.gov/sites/toxzine/lead_toxzine.html

Research has now found that the average race emitted more than 10 kilograms of lead— “a quantity similar to the annual emissions of an average airport.”³⁰

To reiterate, “NASCAR West” operated **weekly races** for **nearly 23 years**. Two schools are now built on or adjacent to this former racetrack. It was not considered as a source of lead in the Study.

- **Legacy Automotive Fuel – Nearby Highways**

Two major thoroughfares abut RHV: Capital Expressway and Tully Road. A major mall was built at this same intersection, given its access to these major thoroughfares. It would be interesting to understand the contribution of these highways and this major intersection to BLLs in the area.

In Santa Clara County, it is estimated in county reports that there is nearly 22000 times more lead from legacy automotive fuel than from aviation; the Santa Clara County Office of Education lead report indicates 13,000 metric tons (13,000,000 kg) of lead exists from legacy automotive fuel.³¹ By contrast, a 2008 EPA study estimated RHV generated 580 kilograms of lead annually.³²

Clearly the impact of lead from legacy automotive fuel in the County far outweighs the impact of RHV.

- **Lead Piping**

Lead pipes are more likely to be found in older cities and homes built before 1986. Among homes without lead service lines, the most common problem is with brass or chrome-plated brass faucets and plumbing with lead solder. EPA estimates that drinking water can make up 20 percent or more of a person’s total exposure to lead. Infants who consume mostly mixed formula can receive 40 percent to 60 percent of their exposure to lead from drinking water.³³

There is no apparent evaluation or consideration of lead pipes in the analysis, nor any consideration to fixtures and solder that might exist in the home. Given that the age of the housing stock in the Study aligns with the period when lead solder was used in homes as well as the demographics of the population, this possible substantial risk should have been considered.

Perhaps interestingly, RHV marks the exact border between the Evergreen water district (which lies generally “downwind” from the airport) and San Jose Water (which lies generally “upwind” from the airport). The sources of these waters, their treatment, and distribution infrastructure all differ; the communities upwind and downwind of the airport are drinking different water.

³⁰ “Lead Exposure Reduces Academic Performance: Intensity, Duration, and Nutrition Matter”, Alex Hollingsworth, National Bureau Of Economic Research Working Paper No. 28250, December 2020, Revised June 2021.

³¹ Santa Clara County Office of Education. “[Children’s Exposure to Lead in Santa Clara County](#)” August 2021.

³² “Memorandum on Selection of Airports for the Airport Monitoring Study”. United States Environment Protection Agency (November, 2010). Retrieved from <https://www.epa.gov/regulations-emissions-vehicles-andengines/epas-data-and-analysis-piston-engine-aircraft-emissions> on 6/17/2021.

³³ <https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water#getinto>

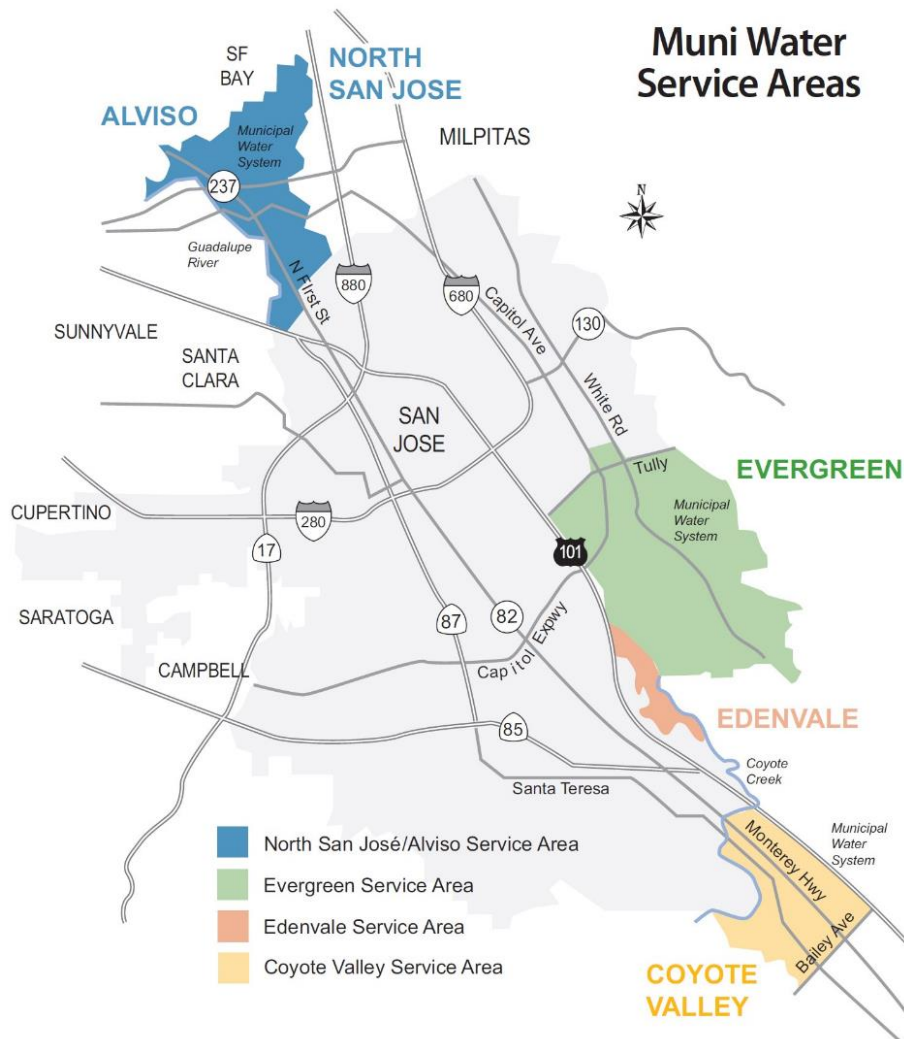


Figure 7 Reid Hillview is at the critical intersection of Capitol Ave and Tully Rd, where the Evergreen Service Area abuts San Jose Water

Furthermore, Santa Clara County schools in the area were only identified as having less than 5 µg/L (0.5 µg/dL); they were not identified as having no lead content.³⁴ As the Study is claiming variations of micro-grams are significant, the impact of this potentially non-zero amount should have been considered.

Furthermore, the California Water Boards has indicated that San Jose has identified six main residential water lines with lead pipes and 6276 connections where lead presence is unknown but may exist.³⁵ San Jose Water’s 2019 annual Consumer Confidence Report (CCR) indicated two samples collected at

³⁴ Lead Sampling of Drinking Water in California Schools [website](#).

³⁵ See the California Water Boards Lead Service Line Replacement Inventory Status [map](#). A California Water Boards media release “[State Water Board Launches Online Map Showing Which Community Water Systems Have lead Fittings](#)”, December 7, 2018, discusses the map.

consumer's taps had lead levels in excess of the regulatory Action Level (AL) of 15 parts per billion (15 µg/L).³⁶

Furthermore, in light of the County's direction that no-lead should be permitted, it is worth noting the permitted lead water standards for both of these service areas.³⁷

- 15 parts per billion (ppb) of lead is the Maximum Contaminant Level (MCL); this is the contaminant level below which there is no known or expected risk to health. This amount triggers a regulatory action. It conforms to the EPA standard.
- 0.2 ppb of lead is the Public Health Goal (PHG). This allows for a margin of safety and is non-enforceable. This is a California standard.

The recommended liters of daily water intake is 2.7 (women) to 3.7 (men) per day.³⁸ At 0.2 ppb, that is 0.74 and 0.54 µg/day lead exposure for men and women, respectively, under the more stringent and non-enforceable California Public Health Goal.³⁹ In short, even under California's stricter standards, people may be legally exposed to (very minute amounts of) lead in their every-day life by simply drinking tap water.

Despite these potential exposures and issues, lead in water, pipes, solder, or fixtures is not raised once in the Study.⁴⁰ The Study never explores the possibility of elevated BLLs due to lead fixtures or solder in homes, despite the age of the neighborhood and the prevalence of lead fixtures and solder during that time.

Study Concerns: Ignored Results Showing Southern Communities Downwind Showed Lower BLLs
The Study ignores that communities south (downwind) of the airport had the lowest BLL, and instead focused on the communities east (also downwind) of the airport that had higher BLL. Even when adjusted for other Study variables, BLLs of children residing south (downwind) of RHV were indistinguishable from those north and west (both upwind) of RHV.⁴¹

³⁶ "[Annual Water Quality Report 2019](#)". San Jose Water. Retrieved on 04/12/2021.

³⁷ <https://www.sanjoseca.gov/your-government/environment/water-utilities/drinking-water/water-quality/water-quality-data>

³⁸ <https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/water/art-20044256#>

³⁹ 0.2 ppb * 1µg/mL / 1000 ppb * 1000 mL/L * 3.7L/day = 0.74 µg/day exposure (men)

⁴⁰ Not fully correct. The Study constantly makes comparisons to the Flint Water Crisis and its lead piping issue.

⁴¹ Mountain Data Group, (p. 40).

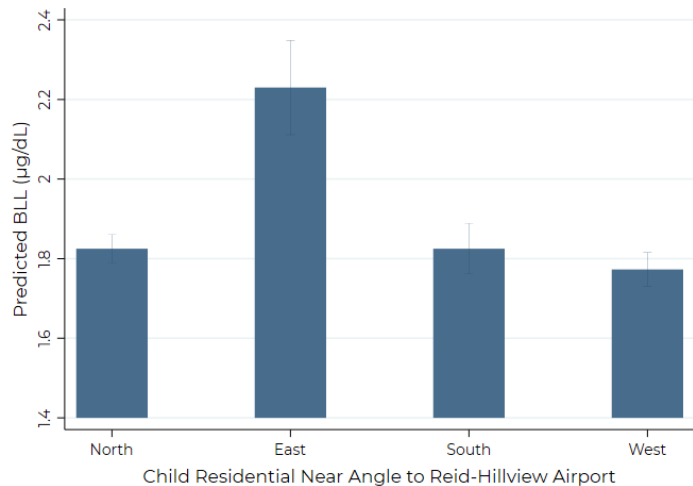


Figure 8 Residential Near Angle to Reid-Hillview Airport and Predicted Child BLLs (adjusted for model)

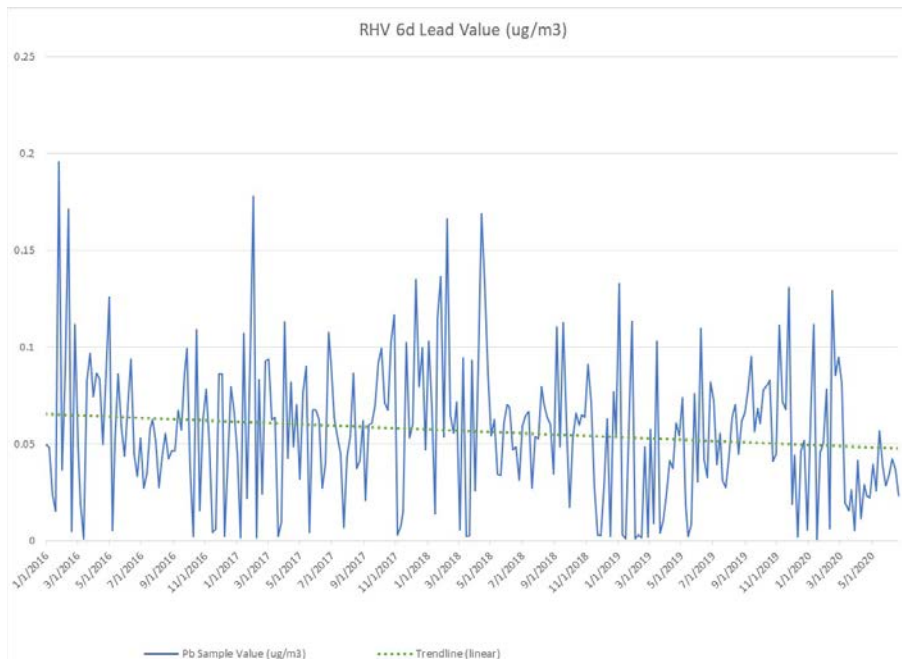
Given that the predominant wind flow is a heading to 130 (south east), predicted BLL for south and east communities should have been comparable and substantially higher than communities north and west.

That is not what the Study found.

Study Concerns: Did Not Include BAAQMD Comparison

The Study's researcher explored but did not include a correlation of BLL to *actual* lead measurements from an EPA-mandated lead meter that is at the airport; this meter is monitored by the Bay Area Air Quality Management District (BAAQMD). While the researcher was provided this data and made a comparison, he did not include that comparison in his Study.

Nonetheless, a copy of the 6-day levels (measurements taken every six days) is provided below:



It is worth noting that in the 4.5 years shown above, only five daily measurements were above 0.15 $\mu\text{g}/\text{m}^3$.

A copy of the rolling three month average – the standard which the EPA uses to evaluate compliance with the National Acceptable Air Quality Standard (NAAQS) – is provided below:



At all times, RHV was substantially below NAAQS. Based on results showing that the 3-month averages were 50% below NAAQS, the BAAQMD indicated that they expected to petition the EPA to discontinue lead monitoring at Reid Hillview airport.⁴² The BAAQMD response further exemplifies the lack of true crisis.

The County's Position to Fully Eliminate Any Lead is Impractical

The County position that all lead must be fully eliminated is a good soundbite and admirable goal, but is an extreme position, economically impractical, and the risk/reward ratio does not support it. Some of the largest contributors to the world's economy permit small levels of lead; these products include gasoline⁴³, conventional vehicle batteries, and cell phones⁴⁴, among many other things. Elsewhere in this report, we have shown that even water is permitted to have a minute level of lead.

Simply put, fully eliminating all lead would, for starters, shut down transportation, anything that requires transportation, billions of cell phones, and eliminate drinking water. The presence of lead in minute quantities does not necessarily indicate that it is a meaningful health risk.

It should be a goal; it cannot be a requirement.

⁴² June 7, 2021 email from Charley A. Knoderer, CCM, Meteorology & Quality Assurance Manager of the Meteorology & Measurement Division of the BAAQMD, to Michael McDonald.

⁴³ Lead is a natural component of petroleum and can exist, by statute, even in unleaded gas.

⁴⁴ https://www.apple.com/environment/pdf/Apple_Regulated_Substances_Specification_March2021.pdf

County Not Permitting or Supporting Further Scientific Study on Lead

The County actually has an opportunity to validate the research, but has been unwilling to do so, further highlighting their specious health concern.

The Study indicates that BLLs should go down with the County's actions to stop the sale of unleaded fuel; this can now be validated ... a positive correlation would show that the County's actions have reduced BLLs in the community, and a negative correlation would indicate that aviation did not lead to an increase in BLLs. Both results would be positive for the community, but neither aligns with the County's political goal of closing the airport and so neither are being pursued.

In addition, while the County is now conducting additional lead studies of RHV, they refuse to include a forensic analysis of the source of the lead which would serve to better target the real sources of elevated lead levels. It is worth noting that the lead author of the Study has previously performed such an analysis. The County's lack of interest in pursuing this analysis further highlights a political – and not a health – agenda.

If their real interest was community health, they would support these research opportunities to better target those at highest risk.

Economic Impact of Closure on Communities

In evaluating the risk/reward of closing airports due to lead, the EPA may wish to consider the economic costs associated with lead remediation versus its potential health benefit.

If excavation is desired down to three feet, a one acre parcel would require the removal of 12 million pounds of soil; as RHV is 180 acres, it would be necessary to remove nearly 2.2 billion pounds of soil. Capping is another solution, but it requires massive amounts of clean dirt and is also not a permanent solution.⁴⁵

As there are thousands of general aviation airports in proximity to schools and communities, the economic expense of the EPA's decision may be tremendous. This cost should be weighed against the number of children realistically impacted.

Angel Flights

My personal passion around aviation centers on Angel Flights, where I and others provide individuals with severe illnesses flights to locations where they can receive life-saving treatments not available in their community. In addition to traditional life-saving flights, non-traditional life-saving flights are also provided including the transportation of abused family members to new communities, blood and organ donation transport, and medical professionals to remote and tribal communities.

The vast majority of these life-saving flights are in piston-engine aircraft that use leaded aviation fuel.

If the EPA provides a negative inference towards general aviation and small airports, that could provide a mechanism to close some "unpopular" airports in northern California. I would like to highlight the number of Angel Flight pilots at those airports, and the number of life-saving missions those pilots have flown.

⁴⁵ Hood, Ernie. "[The apple bites back: claiming old orchards for residential development.](#)" Environmental health perspectives vol. 114,8 (2006): A470-6. doi:10.1289/ehp.114-a470

Airport	Active Angel Flight Pilots	Lifetime Missions Flown
Reid Hillview	30	1586
Palo Alto	51	816
San Carlos	29	409

In evaluating the cost of leaded aviation fuel, the EPA should consider also the life-saving benefits that these aircraft running on AvGas bring.

As of last year, I personally have flown 116 missions; some photos of my passengers are shown below.



Figure 9 Some of the 116 Angel Flight passengers that Michael McDonald has flown.

Thank you for your thoughtful consideration of aviation lead. My hope is that you will support the FAA in providing a smooth and seamless transition to unleaded AvGas.