

Leaded Aviation Fuel: EPA Proposed Clean Air Act Endangerment Finding

Avgas: EJ Implications, Lead Emissions, Disadvantaged Communities

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What's Happening?

- Section 231 of the Clean Air Act (42 U.S.C. § 7571)
 - EPA studies aircraft emissions
 - “Shall” “from time to time” issue emissions standards for pollutants which causes or contributes to pollution which may reasonably be anticipated to endanger public welfare

- Proposed Finding on Aviation Fuel (87 FR 62753, October 17, 2022)
 - Proposed Cause/Contribution and Endangerment Finding re: lead emissions from aviation fuel
 - No emissions standards
 - Small immediate impact, but starts process of regulation and probably elimination

- What is AvGas?
 - 100 Octane (4.24g Pb/Gal) (Alkyl lead, incl. tetraethyl lead)
 - 100LL (2.12 Pb/Gal)
 - 100VLL (0.71 Pb/Gal)

- Piston-Engine Aircraft
 - Mainly General Aviation (GA); about 225,000 piston-engine aircraft in the US
 - 470 tons of Pb; 70% of airborne lead emissions

- How does it work?
 - AvGas is combusted, alkyl lead is oxidized to form lead oxide
 - Ethylene dibromide, lead scavenger, prevents accumulation, brominated lead and lead oxybromides which are volatile at high temps, get pushed out with exhaust
 - When the lead cools in the air, returns to particulate state.

- Lead Emissions
 - 450-550 tons/year; only source of air-related lead in tracked 1,140 counties
 - 60-70% of lead emissions to air in a given year
 - 0.3 tons (RI); 50+ tons (CA)
 - About 50-50 split between in-flight versus takeoff/landing
 - AvGas use declining
 - Mid-1980s: 30,000 barrels/day
 - Now: 12,000
 - 2006/2007 Santa Monica Airport Study
 - “[C]oncentrations of ambient lead that were highest at on- and near airport areas downwind from the emissions of piston-engine aircraft. These data suggest that piston-engine activity can increase ambient lead concentrations in downwind neighborhood sites, resulting in levels that are four to five times higher than background levels and maximum impact site concentrations that are up to 25 times higher than background lead levels.”
 - Principally the same as automotive lead banned previously
 - EPA, 2010: “[T]he summary of the science regarding emissions of lead from motor vehicles presented in the 1997 and 1986 AQCD for Lead are relevant to understanding some of the properties of lead emitted from piston-engine aircraft.”

A Viable Replacement?

- Unleaded AvGas
 - Unleaded fuels not yet widely available
 - But coming on the market: G100UL, many others under development
- “Aviation is remarkable in the resistance to change, particularly on the maintenance side.” Matt Grossman, *Private Aviation Struggles to Move Past Leaded Fuel* Wall St. J. (Jul. 10, 2022).

Who uses leaded fuels?



Which airports are affected and how?

- All airports,* 20,000+, can and do accept GA
 - Some airports have banned the sale of leaded AvGas

- Piston-engine aircraft more common at ‘secondary airports’
 - Centennial Airport, CO
 - McClellan-Palomar Airport, CA
 - San Carlos Airport, CA

- Emissions into air, concentrate on takeoff/landing

- Potential Contamination Issues
 - Small Arms Range Landfill, Minneapolis-St. Paul International Airport Site
 - NPL, lead from AvGas among contaminants

- Endangerment finding is part of broader lead approach
 - Aviation Climate Action Plan
 - EAGLE (Eliminate Aviation Gasoline Lead Emissions) Initiative
 - Eliminate leaded fuels by 2030
 - Piston Aviation Fuels Initiative
- Follow-on Rulemaking, EPA: Emissions standards
- Follow-on Rulemaking, FAA, 49 USC § 44714 (& Section 232 CAA)
 - FAA “shall prescribe -- standards for the composition or chemical or physical properties of an aircraft fuel or fuel additive to control or eliminate aircraft emissions the Administrator of the Environmental Protection Agency decides under section 231 of the Clean Air Act (42 U.S.C. 7571) endanger the public health or welfare”
 - Section 232 of the Clean Air Act requires FAA to prescribe regulations to ensure compliance with EPA’s emissions standards

- FAA is obliged to create its own rule under Section 44714, and EPA can follow the endangerment finding with its own rules
- Stands to reason that they'd work jointly
- Recall that there is a very high standard to force agency action; no clear timeframe
- Comments from FAA during rulemaking indicate potential behind-the-scenes holdup:
 - EPA: “we explicitly asked if you wanted us to mention [Section] 44714 and we were told ‘no’ that this wasn’t appropriate in our [proposed rule].”
 - FAA: “I think our prior concern was that once mentioned, you might be asked what the FAA will do and when, or we would get asked what we plan to do and when. That is not a short answer, as you know.... [W]e cannot even begin to estimate any actions until we see the extent of the finding and any planned activities on the aircraft engine emission side that will need significant cooperation”
- (EPA ultimately did mention Section 44714)

- Harmful Effects of Lead
 - 1960s: Studies on air-based lead emissions
 - 1970s: Lead paint, vehicle fuels
 - 1998: Multimedia Strategy for PBT Pollutants (Alkyl lead)
 - 2002: National Action Plan for Alkyl Lead (67 FR 48177)
 - “[T]he Agency is concerned about any sub-populations that may remain at risk... individuals exposed at racetracks or general aviation airports... the authority to regulate aircraft fuel lies with the Federal Aviation Administration.”
 - 2002 National Emissions Inventory
 - 2006 Air Quality Criteria for Lead
 - 2008: Revised NAAQS 1.5 to 0.15 $\mu\text{g}/\text{m}^3$ (73 FR 66965)

- 2020 EPA Study, *Model-extrapolated Estimates of Airborne Lead Concentrations at U.S. Airports*
 - “3-month average lead concentrations in the maximum impact area range from less than 0.0075 $\mu\text{g}/\text{m}^3$ up to 0.475 $\mu\text{g}/\text{m}^3$ at airports nationwide”

What's been done and what's not been done?

- Rulemaking/Petition Response
 - 2010 ANPRM (75 FR 22439)
 - “The most recent review and revision of the National Ambient Air Quality Standard (NAAQS) for lead, promulgated in 2008, found that serious health effects occur at much lower levels of lead in blood than previously identified and did not identify a safe level of lead exposure.”
- 2006 FOE Petition (72 FR 64570)
 - Lawsuit, 12-cv-363 (2012 DDC)
 - Voluntarily dismissed with 2012 EPA Plan for collecting information to support Section 231 finding

- 2010 ANPRM
 - EPA “estimate[s] that up to 16 million people reside and three million children attend school in close proximity to airport facilities servicing piston-engine aircraft that are operating on leaded avgas.”

- 2011 Study: Children living within 1km of an airport have elevated lead blood levels

- Lead exposure from arriving and departing aircraft raise substantial EJ concerns
 - Areas near runways are often low-income given undesirability of overflights
 - Noise pollution in addition to lead exposure
 - Airport runways are aligned with prevailing winds, and airport locations are highly unique; run-up area location
 - Santa Clara County Ban

- Increasing political awareness
 - “I am outraged that our Federal agencies have failed to prevent lead poisoning near their small general aviation airports... Not only is this historic injustice, but, worse, it is still ongoing...[I]n similar tactics to those we have seen in our committee’s investigation of climate delay and disinformation, the fossil fuel industry and other special interests have also sought to delay the phase-out of leaded aviation fuel.”
 - -Rep. Ro Khanna (D-CA), July 28, 2022 House Sub. Comm. Env. Hrg.
- Lead is already an issue with current political weight
 - Principally concern drinking water (Flint); multiple mentions of lead pipes and clean drinking water in party platforms
 - DNC Platform: “environmental justice, economic justice, and climate justice at the heart of our policy and governing agenda.”

- EJ Concerns
 - Siting
 - Project Development
 - Permit Renewal
 - Many small GA airports do not have clout or significant economic impact
 - “A 1937 official area description of the neighborhood below the flight path of what is now Reid-Hillview Airport described it as extremely undesirable from a racial standpoint as it had the largest concentration of Mexicans in the community, as well as Italians and Portuguese of a lower social stratum.” –Testimony during House Hearing

- Litigation Concerns
 - Parens Patriae
 - Class Actions
 - NRD cases

Local Connections Global Influence

Thank You

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