

“Devil’s Advocate” for SpaceX Public Meeting on Aluminum Furnace

By Andrew Wier

Below are the strongest responses SpaceX and TCEQ could plausibly make. **These are anticipated arguments, not statements they have actually made.** Their strength depends on the final permit conditions and technical-review documents.

1. Demonstrate the building and filtration credits for PM_{2.5} and metals

Likely SpaceX response:

This is a clean-ingot aluminum casting operation, not a scrap smelter. The electrically heated holding furnaces generate relatively small particulate emissions. The building filtration credit follows TCEQ guidance, and the additional filtration credit is modest. We conservatively classified all particulate emissions as PM_{2.5} rather than assuming only a fraction consists of fine particles. The resulting emissions were evaluated through the air-quality analysis and found protective.

Likely TCEQ response:

Accepted engineering methods and emission factors can support an air permit without requiring direct measurement of every source. We reviewed the building and filtration assumptions, together with the modeled impacts. Permit conditions and application representations require the facility to operate consistently with those assumptions.

Assessment: This could be a persuasive response if TCEQ identifies applicable guidance, explains its relevance to fine particles, and specifies enforceable ventilation and filtration requirements. Treating all emitted PM as PM_{2.5} is conservative regarding particle classification, but **does not independently validate the assumed removal efficiency.**

Useful follow-up: “Please identify the guidance supporting 90% building removal of PM_{2.5} and metal-bearing particles, and the permit conditions that maintain the ventilation, door-opening, and filtration assumptions used in that determination.”

2. Explain how hourly limits remain verifiable after removing hourly throughput records

Likely SpaceX response:

Each melting furnace physically cannot exceed its maximum design throughput. Recording hourly production would therefore add administrative work without providing additional assurance of compliance. Monthly production and rolling 12-month records establish compliance

with annual limits. Equipment specifications, fuel-use information, and operating restrictions establish the maximum hourly emissions.

Likely TCEQ response:

Hourly emission limits do not necessarily require hourly throughput records. A permit may use equipment capacity, fuel restrictions, operational requirements, and other appropriate records to demonstrate compliance. Removing one recordkeeping requirement does not remove the hourly emission limits or authorize higher emissions.

Assessment: This is probably their **strongest defense**. There is a legitimate distinction between an emission limit and the particular records used to demonstrate compliance. The decisive question is whether the alternative method establishes the maximum emissions during the applicable averaging period.

The holding-furnace argument requires additional explanation because molten inventory may permit transfers that differ from simultaneous melting production. Whether that matters depends on how holding emissions actually arise and how the emission factor was developed.

Useful follow-up: “What evidence establishes the stated throughput as an absolute hourly maximum, and what alternative records verify it? For the holding furnaces, how does the analysis account for stored molten inventory and simultaneous transfers?”

3. Provide the public calculation basis and completed modeling review before final action

Likely SpaceX response:

The public application identifies the equipment, pollutants, proposed emission rates, calculation methods, and controls. Appendix C contains proprietary production and material information. TCEQ received and reviewed the complete calculations; confidential treatment does not prevent regulatory review. The public does not need access to trade secrets to understand the proposed permit.

Likely TCEQ response:

The uploaded files may not constitute the entire public administrative record. Additional technical-review documents, the preliminary decision, and the draft permit are available through the agency or designated public viewing location. The earlier deficiency was addressed during technical review. Information properly protected as confidential cannot be disclosed, but public emission information remains available.

Assessment: This response could resolve much of the concern if the missing documents are already publicly available. **Absence from our uploaded copies is not proof that TCEQ withheld them or failed to complete its review.**

The strongest remaining request is for enough nonconfidential information to reproduce or meaningfully evaluate the emissions estimates and modeled compliance—not unrestricted disclosure of Appendix C.

Useful follow-up: “Please identify where the final modeling analysis, deficiency response, and technical evaluation can be obtained. Provide a nonconfidential calculation summary sufficient to evaluate emission factors, control credits, maximum operating assumptions, and predicted concentrations.”

The position most likely to withstand these responses

Frame the comments as requests for **specific evidence and enforceable conditions**:

- For particulate controls: identify the technical basis and operating conditions supporting each credit.
- For hourly compliance: identify the alternative demonstration method and its supporting evidence.
- For public review: identify the available documents and supply an adequate nonconfidential calculation summary.

That framing allows SpaceX and TCEQ to answer with evidence while preserving any issue their answers leave unresolved.