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Via Email Only

Michael Krause, Assistant Deputy Executive Officer for Planning, Rule Development, and Implementation
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Subject: Proposed Rule 1495—Commodity Fumigation; Preliminary Draft Staff Report and Preliminary Draft Rule Language

Dear Mr. Krause:

Douglas Products (“Douglas”) appreciates this opportunity to comment on the South Coast Air Quality Management District’s (“SCAQMD” or “the District”) Proposed Rule (PR) 1495—Commodity Fumigation preliminary draft rule language and Preliminary Draft Staff Report that SCAQMD released on September 18, 2026.¹ Douglas manufactures market-proven products to control pests in structural and post-harvest agricultural commodity settings, including a sulfuryl fluoride-based post-harvest commodity fumigant sold under the brand name ProFume®. Sulfuryl fluoride is a highly effective pesticide used for post-harvest fumigation of certain agricultural commodities (e.g., dried fruit and tree nuts) to meet federal food safety requirements and the quarantine phytosanitary requirements of importing countries.

The following comments provide relevant information regarding sulfuryl fluoride to assist your efforts to develop a revised draft rule that effectively addresses the environmental risks, human health risks, and community concerns regarding methyl bromide fumigation that prompted development of PR 1495 without imposing an undue burden on agricultural commodity producers in the District. While both sulfuryl fluoride and methyl bromide are fumigants used on agricultural commodities, they are significantly different substances. As explained below, a one-size-fits-all approach to regulation of different post-harvest commodity fumigants is neither workable nor appropriate. We strongly recommend that SCAQMD limit the scope of PR 1495 to methyl

¹ SCAQMD, *Preliminary Draft Staff Report, Proposed Rule 1495 – Commodity Fumigation* (Sept. 2026), available at https://www.aqmd.gov/docs/default-source/rule-book/proposed-rules/1495/final-pr-1495-pd-staff-report.pdf?sfvrsn=3923637e_3; SCAQMD, *Preliminary Draft Rule Language for Proposed Rule 1495* (Sept. 2026), available at https://www.aqmd.gov/docs/default-source/rule-book/proposed-rules/1495/final-pr-1495-pd-rule-language.pdf?sfvrsn=c022637e_3.

bromide fumigation only and separately address other commodity fumigants, including sulfuryl fluoride, in separate fumigant-specific rules if needed.

We also support the request made by multiple stakeholders during the October 1, 2026 public workshop on PR 1495 for a 60-day extension to the public comment deadline. This additional time is needed to allow stakeholders to fully evaluate the potential impacts of the proposed rule and to provide meaningful technical feedback to SCAQMD staff to inform development of an effective rule.

Sulfuryl Fluoride Is Extensively Regulated to Prevent Exposures to Unsafe Air Concentrations

Sulfuryl fluoride is a federal restricted-use pesticide and California restricted material and toxic air contaminant. Its use is highly and strictly regulated at the federal and state level and is overseen by numerous regulatory agencies, including the United States Environmental Protection Agency (EPA), California Department of Pesticide Regulation (DPR), Structural Pest Control Board (SPCB), and County Agricultural Commissioners.² As a restricted-use pesticide, sulfuryl fluoride can only be used by a certified pest management professional or someone under their supervision in strict accordance with detailed label requirements.

EPA determined that areas where sulfuryl fluoride post-harvest commodity fumigations occur are safe to reenter when concentrations of sulfuryl fluoride are 1 part per million (ppm) or below. In a 2004 human health risk assessment supporting registration of ProFume® for post-harvest fumigation of several agricultural commodities, EPA recommended that the reentry concentration be set at 1 ppm and evaluated potential occupational exposures associated with fumigation and post-fumigation activities using that concentration. EPA concluded that the resulting estimated margins of exposure were at or above the applicable target margins of exposure even under the conservative assumption that workers would be exposed to a constant concentration of 1 ppm throughout the applicable exposure period. EPA noted this assumption likely over-estimated risk because sulfuryl fluoride would continue to dissipate after reaching the 1 ppm reentry threshold.³

Although the 1 ppm concentration is described in the label and EPA assessments principally as a reentry or clearance level, it provides relevant evidence for evaluating potential bystander exposures at the same concentration provided that the exposure duration and frequency are comparable or lower. In fact, the current EPA- and DPR-approved labeling for ProFume® consistently uses 1 ppm as the clearance criterion across multiple potential exposure scenarios.⁴ The label provides that respiratory protection is not required when the measured concentration of ProFume® does not exceed 1 ppm. The repeated use of the same concentration for respiratory protection, leak response, and clearance for reentry demonstrates that 1 ppm functions throughout the EPA- and DPR-approved labeling as the concentration for determining when persons may be present without respiratory protection.

² California Council on Science and Technology (CCST), *Fumigant Use in California and an Assessment of Available Alternatives: Phase II Report on Structural Fumigation with Sulfuryl Fluoride* (dated Dec. 2025, released Feb. 2026), p. 4, available at <https://ccst.us/wp-content/uploads/CCST-Structural-Fumigation-Report.pdf> (last accessed Aug. 19, 2026).

³ EPA, Memorandum regarding “Corrected Human Health Risk Assessment for Sulfuryl Fluoride and Fluoride Anion Addressing the Section 3 Registration of Sulfuryl Fluoride Post-Harvest Fumigation of Stored Cereal Grains, Dried Fruits and Tree Nuts and Pest Control in Grain Processing Facilities. PP# 1F6312” (Oct. 12, 2004).

⁴ EPA, Pesticide Product Label, ProFume® Gas Fumigant (Jun. 23, 2025); available at https://www3.epa.gov/pesticides/chem_search/ppls/001015-00079-20250623.pdf (last accessed Sept. 24, 2026).

EPA's conclusion regarding persons entering and remaining in a previously fumigated space at 1 ppm provides a relevant health-protective point of comparison when evaluating potential bystander exposure at the same or a lower concentration, provided that the exposure duration and frequency are comparable or lower. Given that bystanders would encounter sulfuryl fluoride, if at all, only after the fumigant had been released into outdoor air and undergone additional dilution and dispersion, exposure duration and frequency would be expected to be lower. EPA's application of the same 1 ppm criterion across several exposure circumstances further supports use of that concentration as a point of comparison for potential bystander exposure. A person's designation as a reentrant or bystander does not, by itself, change the toxicological endpoint associated with inhalation exposure. In either setting, the relevant exposure considerations include the airborne concentration and the duration and frequency of inhalation exposure.

Moreover, the labeling for ProFume® requires multiple measures designed to limit worker and bystander exposure during commodity fumigation and aeration. It requires fumigators to prepare and comply with a comprehensive Fumigation Management Plan that accounts for the proximity to bystanders, location of other structures, and wind speed and direction. When aeration is conducted through an exhaust stack, the aeration must occur at the highest point on the structure, using fans or exhaust systems to direct gases upward so that the highest concentrations of fumigant are directed away from workers and bystanders and can quickly dilute. Fumigators must control the exhaust rate during aeration to ensure large volumes of fumigant laden air have time to disperse, thereby reducing potential for bystander exposure, and must monitor the perimeter of the fumigation area (especially downwind) to identify and address concentrations that could result in exposure outside the fumigation area. If this monitoring indicates concentrations exceed the allowed levels in areas where bystanders or residents may be exposed, emergency response and corrective actions are required including notification to local authorities. Additional requirements apply based on site-specific considerations, such as fumigations of storage facilities, transport vehicles, ships, processing plants, and chambers and stacks within structures, to prevent exposure of bystanders and workers to sulfuryl fluoride.

Sulfuryl fluoride released from structures rapidly spreads out in the air, and concentrations of sulfuryl fluoride quickly decrease with distance from the fumigation site and ventilation time. This is demonstrated by studies conducted by Douglas's predecessor, Dow AgroSciences, studies measuring sulfuryl fluoride concentrations following commodity applications in large structures of about 500,000 ft³. For example, data from two of the available studies showed that the 24-hour time-weighted average concentrations measured 100 feet from the edge of the fumigated structure were below 1 ppm during the first day of the application and were below 1 ppm at all monitored distances after the first day.^{5,6} These commodity-fumigation data demonstrate substantial dilution and dispersion with distance and time and indicate that 24-hour average concentrations at locations representative of potential off-site receptors were below EPA's 1 ppm reentry concentration. Because classification of an exposed person as a reentrant or bystander does not, by itself, alter the toxicological endpoint associated with inhalation exposure, the 1 ppm concentration provides a relevant health-protective point of comparison for these data. In addition, an off-site bystander would generally be farther from the

⁵ Barnekow DL; Byrne SL; Foster DR. 2002. *Determination of atmospheric concentrations of sulfuryl fluoride following fumigation of mills using ProFume – North America 2000*. Dow AgroSciences. Lab Report GH-C 5311.

⁶ Foster DR; Barnekow DE; Byrne SL. 2002. *Determination of exposure potential to workers and atmospheric concentrations of sulfuryl fluoride during and following fumigation of a mill using ProFume – North America 2002*. Dow AgroSciences. Report no. GH-C 5465R1.

fumigated enclosure and would not be expected to experience the continuous, constant 1 ppm exposure conservatively assumed in EPA's assessment of post-fumigation workers. Similar results were observed in two CARB studies that measured outdoor air levels of sulfuryl fluoride in a structural fumigation context. These studies showed outdoor air concentrations were less than 1 ppm except in the immediate vicinity of the structure (within 10 feet) during the first six hours of treatment and during ventilation, and levels of sulfuryl fluoride in these areas dropped below 1 ppm within two hours of ventilation.⁷ The collective data from these studies show that bystanders are unlikely to experience sustained exposure to sulfuryl fluoride above 1 ppm.

A California Reference Concentration for Commodity Use of Sulfuryl Fluoride Is Not Yet Available

In the proposed draft rule language, SCAQMD propose to establish sulfuryl fluoride emissions limits, to incorporate those limits into permits to operate, and to impose requirements for fumigant capture, aeration, source testing, parametric monitoring, notifications, and recordkeeping based on those emissions limits. To support the proposed emissions limits, the Preliminary Draft Staff Report cites to health threshold values for acute and chronic sulfuryl fluoride exposure derived by DPR in its 2006 *Sulfuryl Fluoride (Vikane®) Risk Characterization Document* and 2020 *Sulfuryl Fluoride, Addendum to the 2006 Risk Characterization Document, Update of the Toxicology and Reference Concentration* (collectively, "RCDs"). This application of the RCDs is inappropriate because the reference concentrations established in the RCDs are regulatory targets for residential bystanders of structural fumigations, not commodity fumigations.

The RCDs for structural fumigations are not directly applicable to commodity fumigations because they involve different use patterns and potential exposure conditions. As noted above, sensitive receptors are typically located much further away from commodity fumigation sites. Structural and landscape features are different and may impact emissions from the fumigated structure.⁸ The likelihood of exposure to unsafe levels of sulfuryl fluoride during fumigations is also different. In the structural context, such incidents, while rare, often result from persons intentionally and improperly bypassing temporary tenting to enter a structure (e.g., to commit burglary or intentional self-harm).⁹ Such incidents are highly unlikely to occur during commodity fumigation. Until a California reference concentration specific to post-harvest commodity fumigation is available or EPA

⁷ National Pesticide Information Center, Oregon State University, Sulfuryl Fluoride Fact Sheet, [citing to *Report for air monitoring around a structural application of sulfuryl fluoride in Loomis, CA, Summer 2004*, CARB, Monitoring and Laboratory Division, Quality Management Branch, Operations Planning and Assessment Section, Sacramento, 2005; and *Report for air monitoring around a structural application of sulfuryl fluoride in Grass Valley, CA, Summer 2004*, CARB, Monitoring and Laboratory Division, Quality Management Branch, Operations Planning and Assessment Section, Sacramento, 2005], available at <https://npic.orst.edu/factsheets/sfgen.html> (last accessed Aug. 18, 2026).

⁸ CCST, *Fumigant Use in California and an Assessment of Available Alternatives: Phase II Report on Structural Fumigation with Sulfuryl Fluoride* (dated Dec. 2025, released Feb. 2026), p. 43 [noting that structural and landscape features affect ground seal condition and finding that the nature of the ground seal affects emissions of sulfuryl fluoride during fumigation].

⁹ A 2016 OIG Report used Pesticide Illness Surveillance Program (PISP) data to identify 13 incidents since 2002 of residential fumigation in Florida and California that led to serious injury or death. All but one of these incidents involved a person bypassing the temporary tenting to reenter a structure during fumigation or a person remaining inside the residence to be fumigated. (EPA, OIG, *Additional Measures Can Be Taken to Prevent Deaths and Serious Injuries From Residential Fumigations* (Dec. 12, 2016), pp. 7-8; see also CCST, *Fumigant Use in California and an Assessment of Available Alternatives: Phase II Report on Structural Fumigation with Sulfuryl Fluoride* (dated Dec. 2025, released Feb. 2026), p. 63 [noting several significant limitations of PISP data, including inconsistent follow-up or lack of case validation].

develops updated federal reference values,¹⁰ EPA's existing 1 ppm concentration is the most appropriate benchmark for sulfuryl fluoride commodity fumigation uses. DPR has not developed reference concentrations for post-harvest commodity use of sulfuryl fluoride in California. It relies on the current EPA assessment establishing a 1 ppm reentry concentration for sulfuryl fluoride commodity fumigations. This approach protects bystanders of commodity fumigations because, where a bystander's exposure duration or frequency is comparable or lower, as would generally be expected following outdoor dilution and dispersion, exposure at or below 1 ppm would be no greater than the constant-concentration exposure evaluated by EPA. To ensure consistency with DPR-approved product labeling requirements for ProFume®, which are based on the EPA 1 ppm standard, SCAQMD should take the same approach when evaluating potential short-term inhalation exposures associated with sulfuryl fluoride post-harvest commodity fumigations in the District.

Basing evaluation of risks from sulfuryl fluoride commodity fumigation on the current EPA standard also avoids the risk that SCAQMD could impose costly requirements in PR 1495 that are unnecessary to protect human health. This consequence is a likely result of SCAQMD's proposed reliance on DPR's structural fumigation RCDs because DPR's approach to developing the structural fumigation RCDs is highly conservative. It based the RCDs on a no observed effects level (NOEL) plus a high uncertainty factor to account for interspecies variability and intraspecies sensitivity. In contrast, when the Office of Environmental Health Hazard Assessment (OEHHHA) develops reference exposure levels, it considers the no observed adverse effect level (NOAEL).¹¹ DPR's approach leads to structural fumigation RCDs that are likely to be much lower than necessary to protect human health.

We also note that Slide 18 of SCAQMD's presentation for Working Group #3 and the Preliminary Draft Staff Report both contain inaccurate information regarding sulfuryl fluoride, including regarding the acute and chronic reference concentrations proposed by DPR in the RCDs. The following observations are offered to assist with your development of a revised draft rule:

- The asserted acute and chronic health effects identified in the table on Slide 18 and page 1-9 of the Preliminary Draft Staff Report incorrectly implies that the proposed DPR threshold values listed on the slide are based on those asserted health effects. In addition, the Preliminary Draft Staff Report incorrectly asserts that DPR's chronic RCD for structural fumigation is based on damage to bones, teeth, and the respiratory system. None of the health effects identified on Slide 18 or in the Preliminary Draft Staff Report are the critical endpoint for DPR's proposed reference concentrations of 0.75 ppm (acute) and 0.012 ppm (chronic). The critical endpoint for both proposed reference concentrations is neurotoxicity.
- The list of acute health effects (eye and skin irritation, headaches, chest pain, fatigue, dry throat, coughing, and extreme thirst) is drawn from Table 2 of DPR's 2020 RCD Addendum. Table 2 provides a summary of case reports of possible exposure to sulfuryl fluoride associated with a structural fumigation. These case reports are not sufficient to establish acute health effects of sulfuryl fluoride

¹⁰ EPA is also currently evaluating risks associated with post-harvest commodity fumigation use of sulfuryl fluoride. While the risk values under development are still in draft, EPA's updated risk assessments are expected within a year.

¹¹ OEHHHA, Air Toxics Hot Spots Program, Risk Assessment Guidelines, *Guidance Manual for Preparation of Health Risk Assessments* (Feb. 2015), available at <https://oehha.ca.gov/air/cnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-assessments> (last accessed Aug. 19, 2026).

exposure because, as DPR cautions in the Table 2 endnotes, chloropicrin exposure must be assumed due to its inclusion as a warning agent *for residential sulfuryl fluoride fumigations*. This is not the case for commodity fumigations. Chloropicrin is not used in connection with commodity fumigations with sulfuryl fluoride fumigants such as ProFume®.¹²

Chloropicrin is a known irritant that causes the acute health effects identified in the case reports summarized in Table 2. It has a very strong odor and causes immediate eye, nose, and throat irritation even at very low concentrations. Because sulfuryl fluoride is odorless, a small amount of chloropicrin is required to be used for residential structural fumigations to warn people and deter them from entering and remaining in a residence during fumigation.¹³ Even after a building has been cleared for reentry in accordance with the California Aeration Plan,¹⁴ some people may react to very low remaining chloropicrin concentrations.¹⁵ In Table 2, several of the case reports note the presence of an odor, further evidencing that chloropicrin exposure occurred and was likely responsible for the observed acute health effects.

- The observed acute health effects are also often based on extremely limited data that are not sufficient to establish a link between sulfuryl fluoride and the health effect. For example, the 2020 RCD Addendum cites to just one case study involving a report of extreme thirst following reentry to a fumigated residence. This single example based on self-reported symptoms cannot establish a causal link between extreme thirst and sulfuryl fluoride exposure. Additionally, the case report confirms that the family and neighbors “reported a strong chemical odor,” which indicates the presence of chloropicrin and raises the possibility that the reported health effects were caused by chloropicrin exposure, which is not applicable to the commodity fumigations at issue in PR 1495.

Monitoring Data Does Not Show Unsafe Ambient Concentrations of Sulfuryl Fluoride in Nearby Communities

PR 1495 is based on ambient methyl bromide air monitoring measured at 10 sites in the SCAQMD Multiple Air Toxics Exposure Study (MATES) V (2018) and special monitoring in the West Long Beach area by the California Air Resources Board (beginning in 2023) and SCAQMD (beginning in 2025).¹⁶ This monitoring detected elevated methyl bromide levels within the Wilmington, Carson, West Long Beach (WCWLB) Assembly Bill (AB) 617 community by SCAQMD and the California Air Resources Board (CARB).¹⁷ CARB

¹² In the Preliminary Draft Staff Report, page 1-9, Figure 11 depicts canisters of Vikane®, which is not a commodity fumigant. To avoid further unnecessary confusion between sulfuryl fluoride structural and commodity fumigation uses, we request that SCAQMD delete this Figure or replace it with a photo depicting a post-harvest commodity fumigant.

¹³ Bus. & Prof. Code, § 8505.1(b); California Council on Science and Technology (CCST), *Fumigant Use in California and an Assessment of Available Alternatives: Phase I Report on 1,3-D and Chloropicrin*, p. 61, available at https://www.cdpr.ca.gov/wp-content/uploads/2025/03/ccst_fumigants_study.pdf (last accessed Aug. 18, 2026); Harbor Pest Control, *Chloropicrin: Questions and Answers*, available at <https://harborpest.com/articles/q-and-a-chloropicrin> (last accessed Aug. 19, 2026).

¹⁴ The California Aeration Plan is a specialized aeration process approved by DPR to enhance safety during structural fumigations. (See DPR, *California Aeration Plan for Structural Fumigations* (rev. Feb. 19, 2013), available at https://www.cdpr.ca.gov/wp-content/uploads/2025/01/volume_4_appendix_6.pdf (last accessed Aug. 19, 2026).)

¹⁵ Harbor Pest Control, *Chloropicrin: Questions and Answers*.

¹⁶ Preliminary Draft Staff Report, pp. EX-1, 1-1 to 1-2.

¹⁷ See SCAQMD, *Presentation for Proposed Rule 1495 – Commodity Fumigation, Working Group Meeting #1 (January*

convened an interagency working group, including SCAQMD, to reduce potential risks from the elevated methyl bromide concentrations in the ambient air, and the two facilities that are likely responsible for the elevated concentrations agreed to permit conditions to reduce risks from facility operations.¹⁸ Significant community concerns continue to exist regarding ongoing episodic spikes in methyl bromide concentrations and continuing impacts on the environment and human health from exposure to elevated methyl bromide levels in ambient air.¹⁹ SCAQMD initiated the PR 1495 rulemaking to address these concerns,²⁰ and public comments received to date are uniformly concerned with methyl bromide exposure only.²¹

Available air monitoring data do not demonstrate that persistently or repeatedly elevated ambient air concentrations of sulfuryl fluoride at or above EPA's 1 ppm clearance level, or any other adopted federal or state sulfuryl fluoride health risk value, are occurring anywhere in the District due to post-harvest commodity fumigation use. SCAQMD asserts in the Preliminary Draft Staff Report that sulfuryl fluoride breaks down to fluoride ion over time and may lead to excessive fluoride ion levels downwind. SCAQMD does not provide a citation for that statement, and it conflicts with current scientific understanding. Sulfuryl fluoride is highly stable in the atmosphere, with a global atmospheric lifetime of approximately 36 years. There is no evidence that sulfuryl fluoride transforms to free fluoride ion in the lower atmosphere or downwind of fumigation sites. In the absence of data demonstrating sustained off-site sulfuryl fluoride concentrations at levels of concern, and the absence of data demonstrating that sulfuryl fluoride commodity fumigations result in observed sustained off-site fluoride ion concentrations at levels of concern, the basis for SCAQMD's proposed imposition of additional regulatory requirements on sulfuryl fluoride use for post-harvest commodity pest control is unclear,²² particularly when considering the existing extensive regulatory regime and the data discussed above.

It is critical that SCAQMD clarify the sulfuryl fluoride-specific exposure scenario the proposed rule is intended to address and share any data demonstrating that such exposures are occurring within the District with stakeholders and the public. In particular, if SCAQMD is concerned about the potential for bystander or

Presentation) (Jan. 29, 2026), Slide 4, available at https://www.aqmd.gov/docs/default-source/rule-book/proposed-rules/1495/pr1495-wgm1-final.pdf?sfvrsn=682a6a7e_4 (last accessed Aug. 17, 2026).

¹⁸ CARB, Ambient Air Monitoring for Methyl Bromide in West Long Beach, available at <https://ww2.arb.ca.gov/capp/cst/ch2/wcwb/methyl-bromide> (last accessed Aug. 17, 2026).

¹⁹ See Natural Resources Defense Council (NRDC) et al., *Request to Strengthen and Advance Proposed Rule 1495 (NRDC Comments)* (May 7, 2026) [raising concerns related to methyl bromide fumigation only], available at https://www.aqmd.gov/docs/default-source/rule-book/proposed-rules/1495/nrdc-letter.pdf?sfvrsn=bba2667e_3 (last accessed Aug. 17, 2026); University of California, Irvine (UCI), *Fumigation Facilities and Proposed Rule 1495 (UCI Comments)* (Mar. 23, 2026) [same], available at https://www.aqmd.gov/docs/default-source/rule-book/proposed-rules/1495/uci-letter.pdf?sfvrsn=bda2667e_3 (last accessed Aug. 17, 2026); Value Recovery, Inc., *Proposed Rule 1495 — Commodity Fumigation, Rule Making Suggestions to the South Coast Air Pollution Management District (Value Recovery Comments)* (Jan. 5, 2026) [same], available at https://www.aqmd.gov/docs/default-source/rule-book/proposed-rules/1495/pjoyce_1495_rule_suggestions.pdf?sfvrsn=4bc637e_2 (last accessed Aug. 17, 2026); see SCAQMD, *Presentation for Proposed Rule 1495 — Commodity Fumigation, Working Group Meeting #3 (August Presentation)* (Aug. 6, 2026), Slides 5-14 [discussing NRDC Comments and UCI Comments], available at https://www.aqmd.gov/docs/default-source/rule-book/proposed-rules/pr1495-wgm3.pdf?sfvrsn=5f33647e_2 (last accessed Aug. 17, 2026).

²⁰ January Presentation, Slide 8.

²¹ See NRDC Comments; UCI Comments; Value Recovery Comments.

²² See Health & Saf. Code, § 40001 [authorizing air districts to adopt rules to “provide or the prevention and abatement of air pollution episodes which, at intervals, cause discomfort or health risks to, or damage to the property of, a significant number of persons or class of persons”].

community exposures to sulfuryl fluoride or fluoride ion from any specific commodity sulfuryl fluoride fumigation operations in the District, we ask that SCAQMD identify these operations and the factual basis for the concerns. We also ask to be afforded an opportunity to meet with SCAQMD to discuss the sulfuryl fluoride fumigation facilities and SCAQMD's concerns.

SCAQMD Should Consider and Account for Sulfuryl Fluoride's Role as a Methyl Bromide Replacement

Sulfuryl fluoride is an effective alternative to methyl bromide in many applications, including certain quarantine and pre-shipment (QPS) uses of methyl bromide that are still permitted under the *Montreal Protocol on Substances that Deplete the Ozone Layer* (Montreal Protocol).²³ Its availability as an alternative may help permittees comply with SCAQMD's proposed daily and annual limit on methyl bromide emissions. However, if sulfuryl fluoride is included within the scope of PR 1495, there is a risk that the proposed daily and annual emissions limits for sulfuryl fluoride could increase the use of methyl bromide by permittees who, but for the daily or annual limit, may have opted to use sulfuryl fluoride in lieu of methyl bromide.

We recommend that SCAQMD evaluate whether the proposed daily and annual limits on sulfuryl fluoride use would lead to this unintended and counterproductive consequence, and provide information to the public regarding its evaluation. This information should include the scientific bases for each proposed daily and annual emissions limit, including data demonstrating that the proposed limits would result in meaningful additional protection for the environment and public health.

Fumigant-Specific Evaluation of Technologies and Measures to Mitigate Fumigant Emissions Are Needed

SCAQMD's proposed draft language proposes several mechanisms for compliance with the daily and annual emissions limits set out in Tables 1, 2, and 3 of the draft rule, including requiring one of two fumigant capture strategies (tarpaulin fumigation or permanent total enclosure (PTE)), requiring one of two aeration strategies (fumigant aeration system or control equipment), and proposing specific best management practices (BMPs) that, if adopted, would increase the applicable daily and annual emissions limits. We encourage SCAQMD staff to evaluate each proposed strategy and BMP separately for each fumigant proposed to be covered by PR 1495 taking into consideration technical feasibility, economic feasibility and downstream impacts on food affordability, and whether data demonstrates that the measure will help to reduce ambient air concentrations in nearby communities that currently exceed adopted federal or state thresholds. As the below discussion demonstrates, measures that are currently required or in use for one fumigant may not be technologically feasible, economically feasible, or necessary for others.

The proposed capture compliance pathway that relies on the use of a PTE within which fumigation would occur under a continuous vacuum assumes that PTE is an available technology to reduce fumigant emissions for sulfuryl fluoride and other commodity fumigants based on data from SCAQMD's Rule 1405 rulemaking.²⁴ Rule 1405 targets medical sterilization using ethylene oxide, the economics of which are likely to be dramatically

²³ United Nations, "Montreal Protocol on Substances that Deplete the Ozone Layer" (Sept. 1987), available at https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsq_no=XXVII-2-a&chapter=27&clang=en; EPA, Phaseout of Class I Ozone-Depleting Substances, available at <https://www.epa.gov/ods-phaseout/phaseout-class-i-ozone-depleting-substances>.

²⁴ See Preliminary Draft Staff Report, pp. 2-1 to 2.2.

different from agricultural commodity fumigation. Among other things, the industries face different economic pressures and have different profit margins, which impacts whether additional regulatory compliance costs will be passed on to customers. Medical device sterilizers started with mostly enclosed permanent structures that are easier to modify, and sterilization already occurs in chambers with spent gas routed to existing air pollution control systems. The feasibility of PTE for the medical sterilization industry does not indicate PTE is a feasible option for agricultural commodity producers, which generally lack similar existing infrastructure. We recommend that SCAQMD evaluate the costs, feasibility, and necessity of a PTE requirement for sulfuryl fluoride commodity fumigation specifically.

The proposed aeration compliance pathway that relies on installation and operation of capture and control equipment to meet the daily and annual fumigant emissions limits proposed in Tables 1, 2, and 3 appears to be based on SCAQMD staff's assessment of the availability of capture and control technology for methyl bromide and the assumption that the same or similar technology can be used for other fumigants. For sulfuryl fluoride, this assumption is incorrect. There is no viable, commercially-available technology for the capture and control of sulfuryl fluoride following a commodity fumigation. Douglas and the USDA Agricultural Research Service, in collaboration with researchers from Stanford University and the University of Connecticut, began conducting research in 2018 to develop technology that could capture sulfuryl fluoride post-fumigation and break it down into its simpler components (commonly referred to as "scrubber technology"). In 2022, preliminary pilot testing successfully captured and scrubbed sulfuryl fluoride exhaust from a commercial shipping container. However, commercially scaling the scrubber technology is challenging, and several technical hurdles must be addressed.²⁵ Additional research needs include: (1) determining the required sulfuryl fluoride breakdown efficiency at scale, (2) the residence time required for sulfuryl fluoride to react sufficiently with the catalyst at scale, (3) managing the safety aspects of this exothermic reaction, and (4) the safe disposal of the spent solution. Assuming these technical issues can be successfully resolved, future research will be needed to scale the unit to meet various fumigation scenarios, including stack, container, commodity, and food processing facility fumigations. This will require significant time and resources and the outcome is uncertain.

SCAQMD's proposal to require source testing where an owner or operator of a commodity fumigation operation utilizes the control technology compliance pathway also does not appear to be based on an evaluation of available testing technologies for sulfuryl fluoride. The Preliminary Draft Staff Report indicates that SCAQMD based the source testing requirement on testing available for medical sterilization with ethylene oxide and source testing of methyl bromide.²⁶ This proposed requirement appears to presume that source testing methodologies for ethylene oxide and methyl bromide can be applied to sulfuryl fluoride. We ask that SCAQMD evaluate this assumption and provide factual and technical information demonstrating that the source testing requirements for sulfuryl fluoride are feasible.

In addition, the proposed BMPs are based on limited data from methyl bromide fumigations only.²⁷ It appears that SCAQMD has not considered sulfuryl fluoride fumigations specifically, including whether existing sulfuryl

²⁵ CCST, Post-Harvest Commodity Fumigation in California: Roundtable Convening Proceedings, Held November 6-7, 2025 in Sacramento, California (Apr. 2026), p. 15, available at <https://ccst.us/wp-content/uploads/ccst-roundtable-proceedings-post-harvest-commodity-fumigation.pdf> (last accessed Aug. 19, 2026).

²⁶ Preliminary Draft Staff Report, pp. 2-7, 3-2.

²⁷ See Preliminary Draft Staff Report, pp. 1-2,

fluoride-specific label requirements and other regulatory requirements are effectively mitigating any potential risk of bystander or community exposure to sulfuryl fluoride associated with commodity fumigations. We recommend SCAQMD staff evaluate, for each fumigant, the applicability, efficacy, technical feasibility, and necessity of each proposed BMP. Measures currently used to address methyl bromide emissions should not be presumed to provide equivalent emission reductions or exposure benefits for sulfuryl fluoride. Such an evaluation should consider whether each BMP is compatible with the fumigant's physical and chemical properties, the applicable fumigation methods and facility configurations, and existing product-label and federal or state requirements. It should also identify the sulfuryl fluoride-specific data demonstrating that the additional BMP would materially reduce emissions or potential off-site exposures.

As the above discussion demonstrates, a tailored, fumigant-specific approach is needed to effectively address environmental and health risks from commodity fumigations. Accordingly, we ask that SCAQMD tailor its proposed regulation of commodity fumigants to individual fumigants, starting by limiting the scope of PR 1495 to methyl bromide fumigation only. This allows SCAQMD to continue to evaluate the specific risks posed by air emissions of sulfuryl fluoride from post-harvest commodity fumigations based on commodity fumigation-specific reference concentrations and to determine whether additional regulation of this use is necessary and appropriate based on sulfuryl fluoride-specific data. If warranted, SCAQMD should address these air emissions in a separate rule.

We look forward to continued engagement with the SCAQMD team developing PR 1495, and we request an opportunity to meet with you in the next few weeks to further discuss the information provided in this letter. KP Public Affairs will reach out to you by email to schedule this meeting. If you have any questions in the meantime, please do not hesitate to contact me at 269-339-2014.

Sincerely,



Tim McPherson
Vice President Regulatory Affairs
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