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November 16, 2022

**VIA EMAIL ([maryjane.coombs@arb.ca.gov](mailto:maryjane.coombs@arb.ca.gov)) AND U.S. MAIL**

Mary Jane Coombs, Branch Chief, Industrial Strategies Division  
California Air Resources Board  
1001 I Street, P.O. Box 2828  
Sacramento, CA 95814

**Request to Deny Petition to Regulate Sulfuryl Fluoride filed by the Center for Biological Diversity and Californians for Pesticide Reform**

Dear Ms. Coombs:

I am writing on behalf of Douglas Products to respectfully request that the California Air Resources Board (CARB) deny the Petition to Regulate Sulfuryl Fluoride (Petition) filed by the Center for Biological Diversity and Californians for Pesticide Reform (Petitioners) on October 27, 2022, which asks CARB to initiate a rulemaking and take other actions to add sulfuryl fluoride to its greenhouse gas inventory and phase out the use of sulfuryl fluoride in California.<sup>1</sup>

Petitioners paint only part of the picture relevant to CARB's decision to initiate the requested rulemaking, and that picture is misleading. As a result, they ignore the numerous public health, environmental, and economic benefits resulting from the use of sulfuryl fluoride in California and the significant harms that would result from banning its use given the lack of equally effective new alternatives. CARB already has a far greater appreciation of the environmental and economic tradeoffs relevant to determining whether phasing out or otherwise limiting the use of sulfuryl fluoride makes sense from a policy perspective. And CARB has already concluded that California can meet its ambitious and laudable climate goals—carbon neutrality by 2045—without banning the use of sulfuryl fluoride.

As discussed in more detail below, sulfuryl fluoride is a highly effective pesticide used to fumigate structures infested with drywood termites and wood-destroying beetles that damage hundreds of thousands of

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<sup>1</sup> Douglas Products will separately submit additional information to support this request to CARB to deny the Petition. Douglas Products also reserves its right to submit additional comments and information should CARB grant, in whole or in part, the Petition.

properties in California. Sulfuryl fluoride protects and preserves existing housing stock, and in doing so helps California achieve both its affordable housing and climate change policies by reducing embodied carbon resulting from new construction. Sulfuryl fluoride facilitates billions of dollars in trade in dried fruits, nuts, and other commodities in California, and is also used to comply with national food safety laws and international export requirements, which mandate pest eradication from food before shipping. There are no new alternatives that are as effective as sulfuryl fluoride. Petitioners half-heartedly suggest several possibilities, but these alleged “alternatives” do not withstand scrutiny. None are as effective or as efficient as sulfuryl fluoride. Even documents cited by Petitioners in support of these purported “alternatives” concede that the treatments are limited in scope and “prone to misleading marketing claims” regarding their efficacy.<sup>2</sup>

Moreover, sulfuryl fluoride’s contribution to climate change is negligible. Even though sulfuryl fluoride has a higher global warming potential than carbon dioxide on a mass-for-mass basis, the atmospheric concentrations (and rates of emission) of sulfuryl fluoride are many orders of magnitude lower. Thus, the radiative forcing potential of sulfuryl fluoride is minimal compared to carbon dioxide and other greenhouse gases.<sup>3</sup> Annual emissions of sulfuryl fluoride (from all sources) represent about 0.035% the current total anthropogenic greenhouse gas emissions, in terms of carbon dioxide equivalents.

Finally, sulfuryl fluoride use in California is extensively regulated by federal and state agencies whose express missions are to protect public health and the environment. Petitioners fail to demonstrate that CARB intervention is mandated or even necessary given the extensive federal and state regulatory framework that already governs sulfuryl fluoride and protects against the very public harms alleged by Petitioners.

There are no significant climate change or other benefits to be gained from phasing out sulfuryl fluoride in California, and certainly none that would warrant the massive associated economic costs and disruption to the housing market and food supply chain that such an action would entail. CARB is fully discharging its responsibilities to meet California’s greenhouse gas reduction targets, as set forth in the soon-to-be finalized 2022 Scoping Plan. Petitioners provide insufficient justification to support the phasing out of sulfuryl fluoride, and Douglas Products respectfully requests that CARB exercise its discretion pursuant to Section 11340.7 of the Government Code to deny the Petition.<sup>4</sup>

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<sup>2</sup> Bill Mashek & William Quarles, *Orange Oil for Drywood Termites: Magic or Marketing Madness*, THE IPM PRACTITIONER (2008) at 7.

<sup>3</sup> National Oceanic and Atmospheric Administration, Global Monitoring Laboratory, The NOAA Annual Greenhouse Gas Index (AGGI) (updated Spring 2022), available at <https://www.esrl.noaa.gov/gmd/aggi/aggi.html>.

<sup>4</sup> Govt. Code, § 11340.7 (authorizing CARB, within 30 days of receipt of a petition pursuant to Section 11340.7 of the Government Code to “deny the petition indicating why the agency has reached its decision on the merits of the petition in writing ....”).

## DISCUSSION

### **There is no mandate or need for CARB to ban sulfuryl fluoride, and there are more effective ways to regulate greenhouse gases to meaningfully address climate change.**

Contrary to Petitioners' claims, there is no mandatory "duty" or "obligation" for CARB to ban sulfuryl fluoride. CARB can satisfy, and is satisfying, its legal obligation to reduce greenhouse gas emissions to achieve California's climate change goals without additionally regulating sulfuryl fluoride.<sup>5</sup> CARB has already exceeded its original Assembly Bill (AB) 32 mandate to reduce greenhouse gas emissions in the state to 1990 levels by 2020.<sup>6</sup> And CARB recently proposed a Draft 2022 Scoping Plan that meets a more ambitious goal—a further 40% reduction by 2030 and carbon neutrality by 2045—without regulating sulfuryl fluoride.<sup>7</sup> In addition to meeting the greenhouse gas reduction goals of AB 32, Senate Bill (SB) 32, and recently chaptered AB 1279,<sup>8</sup> CARB has fully discharged its obligation to "achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources or categories of sources," as required by AB 32.<sup>9</sup>

Petitioners' claims about sulfuryl fluoride contributions to climate change are misleading. Although sulfuryl fluoride is 4,800 times more potent than carbon dioxide in trapping heat for the same mass, carbon dioxide concentrations in the atmosphere are orders of magnitude larger than sulfuryl fluoride concentrations. Based on our calculations, the ratio of carbon dioxide to sulfuryl fluoride concentrations in the atmosphere is greater than 164 million to one. The ratios of methane and nitrous oxide to sulfuryl fluoride exceed 740,000 and 130,000 to one, respectively. And the concentrations of sulfuryl fluoride in the atmosphere are roughly analogous to:

- A distance of 0.9 miles traveled in a single car compared to the total vehicle miles traveled (VMT) per year by all vehicles in California (about 340 billion VMT).
- The energy consumed by a single 60-watt light bulb for 12 hours compared to the total electricity produced in California in a year (about 280,000 gigawatt hours).<sup>10</sup>

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<sup>5</sup> See 2017 Scoping Plan at ES4 (discussing plan to achieve SB 32 40% reduction by 2030); Draft 2022 Scoping Plan at i (confirming path to meet SB 32 target and expanding scope to carbon neutrality by 2045).

<sup>6</sup> "The state achieved its 2020 GHG emissions reduction target of returning to 1990 levels 4 years earlier than mandated by AB 32." (See <https://ww2.arb.ca.gov/our-work/topics/climate-change#:~:text=The%20state%20achieved%20its%202020,below%201990%20levels%20by%202030.>)

<sup>7</sup> "The 2022 Scoping Plan Update assesses progress toward the statutory 2030 target, while laying out a path to achieving carbon neutrality no later than 2045." (See <https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents.>)

<sup>8</sup> AB 1279 declared the policy of the state to "achieve net zero greenhouse gas emissions as soon as possible, but no later than 2045, and to achieve and maintain net negative greenhouse gas emissions thereafter." (Chapter 337, Statutes of 2022.)

<sup>9</sup> Health & Safety Code, § 38560.

<sup>10</sup> California Energy Commission, *2021 Total System Electric Generation*, available at <https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2021-total-system-electric-generation#:~:text=Items%20of%20note%20for%202021,from%2090%2C208%20GWh%20in%202020.>

- Half a grape compared to the total annual grape production in California (about 5.6 million tons).

Given the minimal contributions of sulfuryl fluoride in the atmosphere compared to other greenhouse gases, California has recognized there are more effective ways to regulate greenhouse gases that can meaningfully impact California's contribution to climate change.

Petitioners also suggest CARB must take additional action to add sulfuryl fluoride to the greenhouse gas inventory.<sup>11</sup> CARB is required to understand emissions of short-lived climate pollutant (SLCPs) based on "available data."<sup>12</sup> In this case, thanks to the California Department of Pesticide Regulation's (DPR) comprehensive pesticide usage tracking regulations, excellent data is already available to CARB concerning the use of sulfuryl fluoride for both structural and post-harvest fumigation. CARB has already made this data available to the public via its "GHG Short-Lived Climate Pollutant Inventory" webpage.<sup>13</sup> As noted there, substantial additional historical data can be obtained from DPR databases. It is therefore unclear precisely what additional action Petitioners think CARB is required to take.

**Sulfuryl fluoride is already extensively regulated by federal and state agencies whose express missions are to protect human health and the environment.**

Petitioners' claim that "[r]egulating sulfuryl fluoride as a GHG and reducing its use will decrease associated health hazards" is deceiving.<sup>14</sup> There is no direct relationship between the fact that sulfuryl fluoride is a greenhouse gas and the public health concerns alleged by Petitioners. Sulfuryl fluoride is a restricted use pesticide,<sup>15</sup> and the public health concerns raised by Petitioners fall squarely within the jurisdiction of, and are already addressed by, the United States Environmental Protection Agency (USEPA) and DPR, among others. Sulfuryl fluoride fumigation is safe when conducted by licensed professionals consistent with federal and state

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<sup>11</sup> See Petition at 10.

<sup>12</sup> See Health & Safety Code, § 39730.

<sup>13</sup> CARB, *GHG Short-Lived Climate Pollutant Inventory*, available at <https://ww2.arb.ca.gov/ghg-slcip-inventory>.

<sup>14</sup> Petitioners suggest that CARB should "phase out" sulfuryl fluoride to prevent other potential non GHG-related harms based on CARB's authority to regulate Toxic Air Contaminants (TACs). (Petition at 8.) But all of the non-greenhouse gas related potential harms of sulfuryl fluoride identified in the Petition relate to the *manner* of its use, not the mere fact that sulfuryl fluoride may be emitted after use. Petitioners concede, as they must, that DPR has primary jurisdiction over how pesticides are used, and DPR already enforces a comprehensive regulatory scheme governing the use of sulfuryl fluoride. The *Harbor Fumigation* case cited by Petitioners (see Petition at p. 10) confirms that DPR has primary regulatory authority to regulate harms arising from the *use* of pesticides that are also classified as TACs. The case does not address authority to regulate under AB 32, and stands only for the unremarkable (and uncontested) proposition that CARB has authority to regulate emissions of TAC pesticides even when DPR has primary authority over the use of those pesticides. The key here, however, is that all of the non-greenhouse gas related harms identified by Petitioners are already addressed by DPR and under FIFRA.

<sup>15</sup> Restricted use pesticides are not available for purchase or use by the general public. "The 'Restricted Use' classification restricts a product, or its uses, to use by a certified applicator or someone under the certified applicator's direct supervision." USEPA, Restricted Use Products (RUP) Report, available at <https://www.epa.gov/pesticide-worker-safety/restricted-use-products-rup-report>; see also DPR, *The permit process for restricted pesticides*, available at <https://www.cdpr.ca.gov/docs/dept/factshts/permitting.pdf>.

laws. In fact, data cited by Petitioners from the California Pesticide Illness Query (CalPIQ) database reveals that structural applications of sulfuryl fluoride each year very rarely result in a significant illness that requires medical intervention.

USEPA is the primary federal regulatory agency for all pesticides. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) governs the registration, distribution, sale, and use of pesticides,<sup>16</sup> authorizes the states to enact more stringent regulation, and delegates enforcement authority to the states.<sup>17</sup> In California, DPR is the primary regulatory agency for pesticide use and enforcement.<sup>18</sup> DPR oversees one of the most comprehensive state pesticide regulation programs in the nation. DPR's integrated network of regulatory activities includes, but is not limited to, measures to mitigate potential health risks to sulfuryl fluoride applicators and bystanders<sup>19</sup> and the monitoring of potential health and environmental impacts from sulfuryl fluoride use.<sup>20</sup> DPR explains that it monitors for pesticides "to find out if air, water, soil, or vegetation has been contaminated by a pesticide, or to learn the extent of contamination."<sup>21</sup> DPR also monitors "to evaluate the likelihood of pesticides causing health problems for workers using pesticides and for people near treated areas, and to provide data to develop new use practices designed to prevent harm."<sup>22</sup> Relevant here, if DPR finds "unacceptable pesticide levels in ambient air, DPR and the county agricultural commissioners will take steps to put in place new use practices to reduce the amount of pesticide that gets into the air."<sup>23</sup>

Additionally, the Structural Pest Control Board<sup>24</sup> is the registration and licensing arm for all structural pest control in California. The board's mission is to "protect the general welfare of Californians and the environment by promoting outreach, education, and regulation of the structural pest management profession."<sup>25</sup>

Petitioners' claims regarding the public harm allegedly resulting from sulfuryl fluoride exposure from structural fumigations also lack critical context.<sup>26</sup> Our review of the CalPIQ database confirms there were 204

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<sup>16</sup> See USEPA, *Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and Federal Facilities* at <https://www.epa.gov/enforcement/federal-insecticide-fungicide-and-rodenticide-act-fifra-and-federal-facilities#:~:text=The%20Federal%20Insecticide%2C%20Fungicide%2C%20and,pesticides%20in%20the%20United%20States>.

<sup>17</sup> *Ibid.*

<sup>18</sup> DPR is charged to "provide for the proper, safe, and efficient use of pesticides essential for production of food and fiber and for protection of the public health and safety." (Food and Ag. Code, § 11501(a).)

<sup>19</sup> DPR works with the California Department of Industrial Relations, Division of Occupational Safety and Health (CalOSHA) and the California Department of Public Health (CDPH) to investigate reported incidents of pesticide exposure.

<sup>20</sup> DPR, *How does California regulate pesticide use?* available at <https://www.cdpr.ca.gov/docs/dept/factshts/main2.pdf>.

<sup>21</sup> DPR, *Monitoring protects us and our environment*, available at <https://www.cdpr.ca.gov/docs/dept/factshts/moni2.pdf>.

<sup>22</sup> *Ibid.*

<sup>23</sup> *Ibid.*

<sup>24</sup> <https://www.pestboard.ca.gov/about/overview.shtml>.

<sup>25</sup> <https://www.pestboard.ca.gov/about/mission.shtml>.

<sup>26</sup> Petitioners appear to allege public harm resulting from sulfuryl fluoride use in food storage when sulfuryl fluoride breaks down and combines with other fluoride exposure pathways, citing to a 2011 USEPA decision proposing to withdraw the use of sulfuryl fluoride in commodities—an action never finalized by USEPA. (See Petition at p. 4.)

cases of exposure reported to DPR between 1992 and 2017,<sup>27</sup> which averages to about 13.6 reports per year. There are an average of 100,000 structural applications of sulfuryl fluoride per year,<sup>28</sup> which indicates that over 99% of structural applications of sulfuryl fluoride each year did not result in a significant illness that required medical intervention. Our review of the 204 cases of exposure reported to DPR between 1992 and 2017 demonstrates that all 16 deaths noted by Petitioners were accidental deaths caused by break-ins or unauthorized entry to structures under fumigation. The deaths did not result from sulfuryl fluoride misapplication or the failure of licensed professionals to follow applicable laws and regulations.

**Petitioners ignore the public health, environmental, and economic benefits of sulfuryl fluoride use and the significant costs associated with eliminating its use.**

The Legislature directs CARB, in implementing AB 32, to “design emissions reduction measures ... in a manner that minimizes costs and maximizes benefits for California's economy [and] maximizes additional environmental and economic cobenefits for California ...,”<sup>29</sup> which necessitates careful consideration of the many benefits of sulfuryl fluoride use and costs associated with eliminating its use.<sup>30</sup> Sulfuryl fluoride protects public health by eradicating pest infestations that can cause illness and disease. Rats and mice can transmit E.coli, Salmonella, and Listeria. Salmonella, for example, can be transmitted in the feces of rats and mice, which contaminate the environment.<sup>31</sup> Rice and Granary Weevils, Sawtooth Grain Beetles, and Red Flour Beetles are also known to contaminate rice and grain crops with Salmonella.<sup>32</sup> Salmonella causes salmonellosis, which can cause serious illness in certain sensitive populations and may even be fatal.<sup>33</sup>

Sulfuryl fluoride commodity treatments protect billions of dollars of California-grown food commodities annually, many of which are exported. In 2021, almonds, pistachios, walnuts, and rice were some of

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<sup>27</sup> California Pesticide Illness Query. [www.cdpr.ca.gov/calpiq](http://www.cdpr.ca.gov/calpiq). Accessed Nov. 1, 2022.

<sup>28</sup> University of California at Berkeley, College of Natural Resources, *Structural Fumigation*, available at <https://nature.berkeley.edu/upmc/fumigation.php>.

<sup>29</sup> Health & Safety Code § 38501(h).

<sup>30</sup> In adopting regulations, CARB is also required to “assess the potential for adverse economic impact on California business enterprises and individuals, avoiding the imposition of unnecessary or unreasonable regulations ....” (See Govt. Code, § 11346.3(a).) Any regulation phasing out sulfuryl fluoride use in California is likely to be a “major regulation” that requires CARB to prepare and submit to the Department of Finance a Standardized Regulatory Impact Assessment that analyzes in detail the economic impact of the proposed regulation, among other things. (See *id.* at § 11346.3(c); Chapter 1 (commencing with Section 2000) of Division 3 of Title 1 of the California Code of Regulations.)

<sup>31</sup> Centers for Disease Control and Prevention, *Diseases Spread by Rodents*, available at <https://www.cdc.gov/rodents/diseases/index.html>; see United States Food and Drug Administration, *Salmonella, Feeder Rodents, and Pet Reptiles and Amphibians—Tips You Should Know to Prevent Infection*, available at <https://www.fda.gov/animal-veterinary/animal-health-literacy/salmonella-feeder-rodents-and-pet-reptiles-and-amphibians-tips-you-should-know-prevent-infection#symptoms>.

<sup>32</sup> Crumrine et al., *Transmission of Salmonella montevideo in Wheat by Stored-Product Insects*, Applied Microbiology (2010).

<sup>33</sup> See United States Food and Drug Administration, *Salmonella, Feeder Rodents, and Pet Reptiles and Amphibians—Tips You Should Know to Prevent Infection*, available at <https://www.fda.gov/animal-veterinary/animal-health-literacy/salmonella-feeder-rodents-and-pet-reptiles-and-amphibians-tips-you-should-know-prevent-infection#symptoms>.

California's top valued agricultural commodities.<sup>34</sup> For almonds alone, in 2014, the total value of industry output was estimated to be \$21 billion, generating over 100,000 jobs statewide.<sup>35</sup> In 2020, the pistachio industry generated \$5.2 billion in economic output and resulted in over 47,000 jobs statewide on a full-time equivalent basis.<sup>36</sup> According to the California Department of Food and Agriculture, almonds, pistachios, and walnuts were California's first, third, and fourth top valued agricultural export commodities in 2020—with exports valued at \$4.6 billion, \$1.7 billion, and \$1.2 billion, respectively.<sup>37</sup> Sulfuryl fluoride is critical to comply with federal food safety laws and international export requirements to eradicate pests from these commodities before shipping.

Sulfuryl fluoride is also critical to the state's housing and real estate market. The housing value in California is \$9 trillion.<sup>38</sup> Assuming only 40% of the houses in California are constructed with wood, without drywood termite treatment, the annual damage from drywood termites in California is \$18 billion.<sup>39</sup> The gain from using sulfuryl fluoride for residential fumigation when the alternative is a localized treatment is estimated to be between \$1.27 and \$3.91 billion.<sup>40</sup> Eliminating sulfuryl fluoride fumigation will cost California \$1.2 to \$4 billion annually.<sup>41</sup>

Moreover, by preserving the state's existing housing stock, sulfuryl fluoride advances several of the state's most critical policy objectives. Sulfuryl fluoride use helps California achieve its ambitious climate change goals by preserving and prolonging the working life of existing structures, which reduces the amount of embodied carbon that would otherwise be generated by new construction.<sup>42</sup> "Worldwide, between now and 2050,

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<sup>34</sup> California Department of Food and Agriculture, *California Agricultural Production Statistics*, available at <https://www.cdfa.ca.gov/Statistics/>.

<sup>35</sup> Sumner et al., University of California Agricultural Issues Center, *The Economic Impacts of the California Almond Industry*, at p. 2, available at [https://aic.ucdavis.edu/almonds/Economic%20Impacts%20of%20California%20Almond%20Industry\\_Full%20Report\\_FinalPDF\\_v2.pdf](https://aic.ucdavis.edu/almonds/Economic%20Impacts%20of%20California%20Almond%20Industry_Full%20Report_FinalPDF_v2.pdf) (estimating the 2014 value of the almond industry at 21.5 billion); see also *The Economic Impacts of the California Almond Industry* fact sheet (Jan. 2015), available at <https://www.almonds.in/sites/default/files/economic-impacts-california-almond-industry.pdf>.

<sup>36</sup> American Pistachio Growers, *California Pistachio Growers and Processors Create \$5.2 Billion Impact on State's Economy*, available at <https://americanpistachios.org/about-us/pistachio-power-unshelled/press-releases/california-economic-impact#:~:text=In%20terms%20of%20total%20economic,%2410%2C000%20every%20minute%20in%202020.>

<sup>37</sup> California Department of Food and Agriculture, *California Agricultural Exports (2020-2021)*, at p. 1, available at [https://www.cdfa.ca.gov/Statistics/PDFs/2021\\_Exports\\_Publication.pdf](https://www.cdfa.ca.gov/Statistics/PDFs/2021_Exports_Publication.pdf).

<sup>38</sup> Zilberman et al. (Nov. 4, 2022). *The economic benefits model supports the use of sulfuryl fluoride for dry wood termites in California* (PowerPoint presentation). Methyl Bromide Alternatives Outreach (MBAO): Fumigation and Alternatives for Production, Storage, and Trade Conference, Orlando, FL. <https://mbao.org/conference>.

<sup>39</sup> *Ibid.*

<sup>40</sup> *Ibid.*

<sup>41</sup> *Ibid.*

<sup>42</sup> Preservation Green Lab, National Trust for Historic Preservation, *The Greenest Building: Quantifying the Environmental Value of Building Reuse*, at p. 21, available at <https://forum.savingplaces.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=5119e24d-ae4c-3402-7c8e-38a11a4fca12&forceDialog=0> (discussing a key findings a 2008 study by the U.K.-Based Empty Homes Agency that "reveal that the reuse of empty homes could yield an initial savings of 35 tons of CO2 per property if the embodied energy related to new building materials and construction were eliminated.").

embodied carbon is expected to account for over half of total greenhouse gases from all new construction, according to a 2021 report from the World Green Building Council. The fact that embodied emissions happen up front skews the short-term ratio: over the next 10 years, they are expected to account for 72 percent of the global building sector's total."<sup>43</sup> Adaptive reuse of existing structures is repeatedly recognized as a valuable tool reduce to carbon dioxide emissions in the atmosphere by reducing embodied carbon from new construction.<sup>44</sup>

Preserving existing housing stock also helps contain rising housing costs and makes houses more affordable for Californians—a core component of the state's affordable housing policy. According to the National Association of Home Builders, the median price of a newly built home is about 8.4% higher than the median price of a typical existing home.<sup>45</sup> Safe and affordable housing is also an environmental justice issue. The California Association of Realtors reported that “[h]ousing affordability deteriorated in 2021 for all California ethnic-home buying groups, largely due to double-digit home price growth that occurred during the COVID-19 crisis.”<sup>46</sup> “About one-fourth of all Californians could afford to purchase the \$786,750 statewide median-priced home in 2021 ....”<sup>47</sup> “By ethnic groups, more than one-third of white California households, and less than one in five Black and Latino California households could afford the same median-priced home ....”<sup>48</sup>

**Sulfuryl fluoride has been proven to completely eliminate pest infestations in structures and commodities, and there are no new equally effective alternatives.**

Scientific research demonstrates that sulfuryl fluoride fumigation is the most thorough, consistent, and efficacious treatment for control of drywood termites in structures when compared to other treatments, including the allegedly “cost-effective” treatments touted by Petitioners. More than four decades of research has failed to identify new alternatives that are equally as effective as sulfuryl fluoride fumigation in eradicating pest infestations in structures.<sup>49</sup>

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<sup>43</sup> Logan, Katherine, *Continuing Education: Embodied Carbon & Adaptive Reuse*, Architectural Record (Feb. 1, 2022), available at <https://www.architecturalrecord.com/articles/15481-continuing-education-embodied-carbon-adaptive-reuse>.

<sup>44</sup> See *ibid.*; see also Lindberg, Jim, *The Reuse Imperative*, National Trust for Historic Preservation, Preservation Leadership Forum, available at <https://forum.savingplaces.org/blogs/jim-lindberg/2022/03/16/the-reuse-imperative>.

<sup>45</sup> See National Association of Home Builders at <https://www.nahb.org/-/media/NAHB/news-and-economics/docs/housing-economics/sales/median-prices.pdf>.

<sup>46</sup> California Association of Realtors, *Housing affordability for all Californians worsened amid skyrocketing home price growth during pandemic, C.A.R. reports: Black and Latino households who can afford to buy are half that of whites, illustrating wide racial homeownership divide* (Mar. 24, 2022), available at <https://www.car.org/aboutus/mediacenter/newsreleases/2022releases/2021haibyethnicity>.

<sup>47</sup> *Ibid.*

<sup>48</sup> *Ibid.*

<sup>49</sup> Petitioners fail to discuss the availability or efficacy of any sulfuryl fluoride alternatives in the commodities settings. Instead, Petitioners claim that pest infestation prevention “can be achieved through careful management of equipment and conditions, such as keeping the product at appropriate humidity levels,” among other measures. (Petition at p. 15.) Because Petitioners fail to substantively address this issue, including how pest infestations are prevented when these measures fail, we have focused our



Detecting and accessing active drywood termite colonies—which is critical to the efficacy of localized treatments—is difficult due to the unique biology of drywood termites and the relatively small size of their colonies.<sup>50</sup> In all research in which localized insecticide treatments were applied to structural wood (i.e., boards, exposed wood in buildings) naturally infested with drywood termites, none of the treatments completely controlled all the termites.<sup>51</sup> Drywood termite colonies can recover from control treatments with as little as 20 surviving nymphs, even if the primary king and queen are killed.<sup>52</sup> Therefore, treatments that do not eliminate colonies can result in ongoing and resurging infestation.<sup>53</sup> Efficacy of localized insecticide treatments also vary widely based on the active ingredient, formulation, and spacing of injection holes. In general, liquid Timbor (borate) and XT-2000 (d-limonene, “orange oil”) had the lowest efficacy compared to other insecticidal treatments.

The University of California at Berkeley conducted a landmark study in which fumigation and nonchemical methods, including electrocution and microwaves, were evaluated for control of drywood termites in artificially and naturally infested wood boards that were placed inside a structure built for this trial. Infested wood boards were replaced after each treatment.<sup>54</sup> In this study, sulfuryl fluoride provided 100% control of drywood termites. In contrast, researchers observed electrocution was excessively technique driven,

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discussion on the lack of available new equally effective alternatives in the structures setting. We note, however, that sulfuryl fluoride has numerous advantages over other treatments in the commodities setting, including greater efficacy on target pest species, lack of pest resistance, shorter treatment times, and the lack of residues on hard surfaces or food processing equipment. Douglas Products can provide more information on this issue if necessary.

<sup>50</sup> Harvey, P. A. 1934. Biology of the dry-wood termite, pp. 217-233. In: Kofoid, C. A., Light, S. F., Horner, A. C., Randall, M., Herms, W. B. and Bove, E. E. (eds.), *Termites and termite control*, University of California Press, Berkeley, CA; Su, N.-Y. 1994. Field Evaluation of a Hexaflumuron Bait for Population Suppression of Subterranean Termites (Isoptera: Rhinotermitidae). *J. Econ. Entomol.*: 389–397; Lewis, V., and B. Forschler. 2014. Management of drywood termites: past practices, present situation and future prospects, pp. 130-153. In: R. Dhang (ed.), *Urban Insect Pests: Sustainable Management Strategies*, CABI Publishing, Boston, MA.

<sup>51</sup> Lewis, V.R., S. E. Moore, R. L. Tabuchi, and G. M. Getty. 2011. Field Evaluation of Insecticides for Western Drywood Termite Control, 2009. *Arthropod Management Tests* 36 (1), 2 pp. <https://doi.org/10.4182/amt.2011.J5>; Rust, M. and J. Venturina. 2009. Evaluation of Chemical Localized Treatment for Drywood Termite Control, Final Report 2009, STRUCTURAL PEST CONTROL BOARD GRANT No. 084-4231-7. 31 pp.

[https://www.pestboard.ca.gov/howdoi/research/2009\\_drywood\\_rpt.pdf](https://www.pestboard.ca.gov/howdoi/research/2009_drywood_rpt.pdf); Scheffrahn, R.H., N.-Y. Su, and P. Busey. 1997. Laboratory and field evaluations of selected chemical treatments for control of drywood termites (Isoptera: Kalotermitidae). *J. Econ. Entomol.* 90: 492-502; Woodrow, R. J., J. K. Grace, and R. J. Oshiro. 2006. Comparison of localized injections of spinosad and selected insecticides for the control of *Cryptotermes brevis* (Isoptera: Kalotermitidae) in naturally infested structural mesocosms. *J. Econ. Entomol.* 99: 1354-1362; Hickman, R., and Forschler, B.T. 2012. Evaluation of a localized Treatment Technique Using Three Ready-to-Use Products Against the Drywood Termite *Incisitermes snyderi* (Kalotermitidae) in Naturally Infested Lumber. *Insects*. 3: 25-40.

<sup>52</sup> Smith, M. 1995. Drywood termites: the experts answer some ‘toughies.’ *Pest Control Technology* 23: 2, 34, 36-37, 40, 88.

<sup>53</sup> Even Petitioners acknowledge the treatments they tout are less effective than sulfuryl fluoride fumigation. Petitioners admit that orange oil coupled with heat treatment and d-limonene vapors resulted “in either complete or almost complete mortality,” that treatments incorporating certain essential oils “had 92-100% termite mortality by day seven” and “with the incorporation of the essential oil there was more than 90% mortality rate of the termites.” (See Petition at p. 13.) Additionally, a document that Petitioners cite for the premise that localized treatments may “suffice” (see Petition at 12 n. 78) concedes the localized treatment it focuses on (in that case, orange oil) is prone to “misleading marketing claims” and that companies using it “usually do not warranty a whole house to be free of termites.”

<sup>54</sup> Lewis, V.R. and M.I. Haverty. 1996. Evaluation of six techniques for control of the Western drywood termite (Isoptera: Kalotermitidae) in structures. *J. Econ. Entomol.* 89: 922-934.

requiring drilling holes to insert metal pins to aid transmission of current below the surface, and displayed poor control (less than 90%). Microwave treatments produced high variability in results, in part because the dosage applied could not be measured or confirmed. This is unlike sulfuryl fluoride fumigation in which the required dosage is calculated for target pest and treatment site conditions using a label-required calculation tool, and the amount of fumigant introduced is measured gravimetrically. Microwave treatment also resulted in warping of the treated boards due to nonuniform heating. This type of structural damage does not occur during sulfuryl fluoride fumigation.

Heat can be used as a whole structure treatment. However, for heat treatment to be effective, internal wood temperatures must be raised to 120°F for at least 33 minutes to kill drywood termites. Because wood is a good insulator, the temperature inside the structure is raised with heaters to 140 to 150°F for several hours to one day.<sup>55</sup> Wood provides insulation against rapid temperature changes so heat treatment is not as reliable and effective as sulfuryl fluoride fumigation for control of drywood termites.<sup>56</sup> It is difficult to raise the internal core temperature of large infested structural beams and the potential for heat sinks to be present (areas within the structure that are difficult to heat such as wood on tile or concrete) can result in the need for an extended treatment time of several hours to several days.<sup>57</sup> Heat treatments have caused damage to paint and plumbing in research trials evaluating its efficacy for drywood termite control.<sup>58</sup> Heat treatment is a potential fire hazard<sup>59</sup> and may irreversibly damage heat-sensitive contents typically found in buildings, such as electronic devices and appliances. For these reasons, heat treatment has not been adopted or widely used for drywood termite control.

Finally, as even Petitioners acknowledge,<sup>60</sup> responsible chemical pesticide use plays a critical role in the Integrated Pest Management (IPM)<sup>61</sup> continuum when there are no other effective methods or measures to prevent pest populations from adversely impacting human health, the environment, and the economy. Sulfuryl fluoride, which has proven highly effective in both the structures and commodities settings and for

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<sup>55</sup> Lewis, V. R. A. M. Sutherland, and M. I. Haverty. 2014. Pest Notes: Drywood Termites, UNIVERSITY OF CALIFORNIA AGRICULTURE AND NATURAL RESOURCES STATEWIDE INTEGRATED PEST MANAGEMENT PROGRAM (Aug. 2014), <http://ipm.ucanr.edu/PMG/PESTNOTES/pn7440.html>; Woodrow, R. J. and J. K. Grace. 1998. Field Studies on the Use of High Temperatures to Control *Cryptotermes brevis* (Isoptera: Kalotermitidae). *Sociobiology* 32(1): 27-49.

<sup>56</sup> Lewis and Haverty 1996.

<sup>57</sup> *Id.*; Lewis et al. 2014; Woodrow and Grace 1998.

<sup>58</sup> Lewis and Haverty 1996; Woodrow and Grace 1998.

<sup>59</sup> Lewis and Haverty 1996.

<sup>60</sup> See Petition at p. 15 (“Finally, in Integrated Pest Management, chemicals are used only when needed and in combination with other approaches for more effective, long-term control. Chemicals are selected and applied in a way that minimizes their possible harm to people, nontarget organisms and the environment.”).

<sup>61</sup> Integrated Pest Management (IPM) focuses on long-term pest prevention through a combination of techniques such as biological controls, cultural controls, mechanical and physical controls, and chemical controls. (7 U.S.C. § 136r [defining IPM as “a sustainable approach to managing pests by combining biological, physical, and chemical tools in a way that minimizes economic, health, and environmental risks.”]; see also <https://www.usda.gov/oce/pest/integrated-pest-management>; see also DPR, *What is Integrated Pest Management (IPM)?*, at <https://www.cdpr.ca.gov/docs/pestmgmt/ipminov/overview.htm> [considering necessary chemical pesticide use as part of IPM “if monitoring indicates they are needed ....”].)

which there is no new equally effective alternative, is an essential component of IPM.

### CONCLUSION

Given the negligible climate change contributions of sulfuryl fluoride, the extensive existing federal and state regulatory framework governing sulfuryl fluoride use in a public health- and environmentally protective manner, and the overwhelming benefits of sulfuryl fluoride, as well as the tremendous and far-reaching costs of eliminating its use, Douglas Products respectfully requests that CARB exercise its discretion pursuant to Section 11340.7 of the Government Code to deny the Petition.

Thank you for your time and attention to our request. If you have any questions or concerns, or need additional information, please feel free to contact me at [janet.rowley@douglasproducts.com](mailto:janet.rowley@douglasproducts.com).

Sincerely,

*Janet Rowley*

Janet Rowley, International Business Leader  
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