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## **Response to Information Solicitation to Inform Implementation of the Dairy and Livestock Provisions of SB 1383**

Dr. Cliff, Director Oppenheimer, and Secretary Ross:

Leadership Counsel for Justice and Accountability, Defensores del Valle Central para el Aire y Agua Limpio (“Defensores”), Animal Legal Defense Fund, and Food & Water Watch (collectively, “Commenters”) submit the following comments in response to the California Air Resources Board’s (“CARB”) SB 1383 Information Solicitation.

### **I. INTRODUCTION**

SB 1383 rulemaking is a critical opportunity for CARB to course correct California’s policy framework for dairy and livestock methane emissions. Thus far, CARB has pursued counterproductive policies that have entrenched the systems and management decisions at dairies that are the root cause of the sector’s massive methane emissions. In the process, CARB has exacerbated the scope and intensity of local pollution in the San Joaquin Valley communities that bear the brunt of out-of-control dairy and livestock expansion and methane production. Adopting and implementing an effective rule pursuant to SB 1383 is CARB’s opportunity to truly begin regulating and reducing factory farm pollution.

In 2016, the Legislature passed SB 1383 to require CARB to adopt regulations that reduce manure methane emissions in a manner that ensures California will reach a 40 percent reduction from 2013 levels by 2030.<sup>1</sup> In its 2022 Analysis of Progress Toward Achieving the 2030 Dairy and Livestock Sector Methane Emissions Target, CARB admitted that the sector was not on track to achieve the 2030 goal, noting that “[it] is projected to achieve just over half of the annual

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<sup>1</sup> Cal. Health & Safety Code § 39730.7(b)(1) (“[CARB] *shall* adopt regulations to reduce methane emissions from livestock manure management operations and dairy manure management operations . . .”) (emphasis added).

methane emissions reductions necessary to achieve the target by 2030.”<sup>2</sup> Now in 2026, CARB has yet to implement regulations to directly regulate dairy methane, or even adopt them, despite its authority and clear need to do so for over two years.<sup>3</sup> SB 1383 rulemaking is overdue and voluntary incentive-based mechanisms will continue to fall short of the 2030 target and exacerbate environmental injustices. CARB must act swiftly to adopt and implement equitable regulations that target the largest contributors to dairy and livestock pollution with mandatory reductions.

Longtime residents of the San Joaquin Valley, like Defensores member María Arévalo, remember the Valley before unchecked pollution from massive dairies.<sup>4</sup> Since Arévalo moved to Pixley in 1967, the rise of large dairies followed by biogas production has ravaged the environmental health of Tulare and other San Joaquin Valley counties. Today, more than ninety percent of California’s milk cows reside in the Valley and herds are consolidating into ever larger dairies at an increasing rate in response to CARB’s perverse factory farm biogas policies under the Low Carbon Fuel Standard (“LCFS”).<sup>5</sup> This means that climate and local pollution are also getting more extreme at the facility level as individual dairies are now generating more pollution than ever before and in closer proximity to other large dairies doing the same.<sup>6</sup>

The vast majority of large-scale dairies deliberately rely on manure management methods that are climate intensive and heavily pollute the local environment. The result is that large dairies subject the disproportionately lower income and Latino/a/e residents of the San Joaquin Valley to noxious odors that betrays the presence of numerous air pollutants and contaminated drinking water. Year after year, cities across the San Joaquin Valley consistently rank among the most polluted in the country with respect to both fine particulate matter and ozone, well documented factory farm pollutants.<sup>7</sup> And the Latino/a/e-majority communities that reside closest to dairies also face nitrate-contaminated drinking water that jeopardizes their health, caused in large part by the disposal of manure and other waste from large dairies to nearby fields.<sup>8</sup>

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<sup>2</sup> CARB, *Analysis of Progress Toward Achieving the 2030 Dairy and Livestock Sector Methane Emissions Target*, ES-2 (Mar. 2022), <https://perma.cc/U494-SVV3>.

<sup>3</sup> Cal. Health & Safety Code § 39730.7(b)(4).

<sup>4</sup> CARB Board Meeting, 23-8-1: Public Meeting to Hear an Update on the Low Carbon Fuel Standard, 233-34 (Sept. 28, 2023), <https://perma.cc/4R3H-HG7R>; Gaea Cabico, *How a California Clean Energy Program Became a Boon for Big Dairies*, Sentient (Oct. 1, 2025), <https://perma.cc/P37J-2WXM>.

<sup>5</sup> U.S. Dept. Of Agric., 2022 Census Of Agriculture: California State And County Data 16, 20 tbl. 12.

<sup>6</sup> Herd consolidation and size increases more than tripled when comparing the period before avoided methane crediting was introduced into the LCFS, with 2012–2017 showing a growth rate of 12.68 percent and the period after, 2017–2022, showing a growth rate of 42.68 percent. *Compare* USDA, 2017 Census of Agriculture: California State and County Data 20 tbl. 12, *with* USDA, 2022 Census of Agriculture: California State and County Data 16 tbl. 12.

<sup>7</sup> Am. Lung Ass’n, *State of the Air 2026*, 16, 21, 24 (2026), <https://perma.cc/52KL-VCCR>.

<sup>8</sup> Anne Weir Schechinger, Environmental Working Group, “In California, Latinos More Likely To Be Drinking Nitrate-Polluted Water” (Oct. 2020), [www.ewg.org/interactive-maps/2020-california-latinos-more-likely-drinking-nitrate-polluted-water](http://www.ewg.org/interactive-maps/2020-california-latinos-more-likely-drinking-nitrate-polluted-water).

Despite its role as the agency with regulatory authority over the dairy and livestock industry's climate emissions, CARB has encouraged some of the sector's most harmful practices. Chief among these is widespread and intentional reliance on flush manure management. These systems use large amounts of water to flush manure into storage lagoons where anaerobic conditions catalyze methane generation. Rather than heed its clear SB 1383 mandate, CARB has championed anaerobic digesters and manure biogas production as a methane pollution mitigation measure through its administration of the LCFS, other market-based credit schemes, and other subsidies. This has perversely incentivized dairies to consolidate herds and continue to rely on flush systems to produce as much methane as possible.

In the decade since SB 1383's passage, rulemaking requiring methane reductions has not occurred nor have the San Joaquin Valley communities impacted most by massive dairy herds seen any of the benefits reaped by the large-scale dairies that contaminate their land, air, and water. Instead, unregulated dairies have profited from burdening rural communities across the Valley with methane and other pollutants, all while CARB has continued to expand markets for factory farm biogas and provide large subsidies bankrolled by California taxpayers, ratepayers, and consumers.

But under SB 1383, CARB must take a different approach and can no longer assume massive methane emissions from dairy and livestock manure management as an inevitability. This pollution is emitted by factory farms that choose manure management practices that place cost efficiency and profit over the environment and vulnerable communities. CARB's SB 1383 rulemaking must start from this fundamental premise that concentrating thousands of cows on a single facility and relying on liquified manure management is a choice, not an immutable aspect of dairy production. SB 1383 mandates that CARB's direct regulation of methane replace its incentives and subsidies for factory farm biogas. Through this SB 1383 rulemaking, CARB has the opportunity to institute a regulatory framework that serves as both a remediation and corrective enforcement tool that can be responsive to environmental justice communities and mitigate, not exacerbate, the harms of increasingly large and concentrated dairy operations.

To achieve equitable and meaningful outcomes in furtherance of the SB 1383's 2030 methane emissions reduction target, CARB's rulemaking must:

- **Center environmental justice outcomes** by creating a regulation that prioritizes methane and other pollutant reductions in the San Joaquin Valley, and imposes mandatory reporting and reduction measures on the largest dairy superemitters in this region first.
- **Focus on mandatory direct emissions reductions** and phase out expensive and ineffective subsidies that cost Californians through both their pocketbooks and their health and well-being.

- **Ensure accurate methane accounting** by basing progress on real world, facility-level monitoring rather than estimations and modeling, and ensuring that emissions reductions counted toward the SB 1383 target are not already claimed by any other program or sector.

## **II. Environmental Justice Must Guide SB 1383 Rulemaking**

CARB's SB 1383 rulemaking stands to make a transformative impact on San Joaquin Valley communities most overburdened by dairy and livestock pollution. To do so, CARB's adoption and implementation of regulations must occur through an environmental justice lens that not only institutes mandatory methane reductions, but takes a holistic approach that mitigates other health-harming pollutants generated by factory farming as well. The San Joaquin Valley residents represented by Commenters have made their needs clear: anaerobic digesters are not a solution to the environmental and health impacts they face; meaningful, equitable change will occur when CARB holds the most polluting dairies accountable through direct regulation, including civil enforcement mechanisms.

### **A. Methane-intensive factory farming is a business model that disproportionately impacts Latino/a/e and low-income communities in the San Joaquin Valley**

CARB's approach to SB 1383 rulemaking must not proceed under the assumption that the factory farm model of producing milk and raising livestock is unavoidable and immutable. Indeed, livestock methane emissions from manure only became a leading climate threat when dairies began expanding their operations and shifted to liquification and lagoon storage to reduce costs associated with the increase in manure that accompanied massive consolidation and herd expansion.<sup>9</sup> The relatively recent rise of industrialized dairying in California and its environmental justice impacts in the San Joaquin Valley underscore that factory farming and its many ills are not set in stone and can be reined in under CARB's direction via its SB 1383 authority, not rewarded and supercharged as CARB has done under other programs it administers.

In the 1990s, California's dairy industry saw a shift from San Bernardino County to the San Joaquin Valley. Producers sought to evade stricter water quality regulation instituted in response to groundwater pollution of the Chino Basin.<sup>10</sup> The San Joaquin Valley had laxer environmental regulations and policymakers willing to accept the negative environmental impacts and localized pollution associated with liquid manure management and expanding herds.<sup>11</sup> Over the last three

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<sup>9</sup> EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022, EPA 430-R-24-004, 5-11-5-13 (2024), <https://perma.cc/S4JS-4D3Q>.

<sup>10</sup> Leadership Counsel for Justice and Accountability, *Factory Farm Dairies, Biogas, And The Dangerous Path California Is On* (Jan. 2023), <https://perma.cc/9FEC-UJ87>; see generally Susan Lauer, *Inland Empire Utilities Agency: 65 Years of Making Every Drop Count* (2015), <https://perma.cc/X52V-WHG2>.

<sup>11</sup> *Id.*

decades, California has remained the country's leading dairy producer, with more than 95% of California milk production coming from large dairies in the San Joaquin Valley where some individual dairies are now as big as almost 20,000 head.<sup>12</sup> Yet, the industry's proliferation and financial success in the region have come at the cost of its most environmentally burdened residents.

Communities situated near dairies that are superemitters of methane are vulnerable to intensified exposure to other harmful pollutants as well. In California, as in other states, this proximity disproportionately impacts low income, people of color.<sup>13</sup> San Joaquin Valley residents are disproportionately Latino/a/e compared to the rest of California, with Latino/a/e communities more likely to be located near dairies.<sup>14</sup> Researchers mapping these disparities agree with affected residents that methane reduction regulations to address climate change should be shaped to respond to disproportionate exposure to health-harming pollutants by prioritizing reductions in environmental justice communities.<sup>15</sup> To this end, CARB must ensure that the concerns of individuals living near dairies and in the regions most impacted by large-scale dairies are at the forefront of its SB 1383 rulemaking.

## **B. Liquid manure management exacerbates environmental injustice in the San Joaquin Valley**

As the dairy industry expanded into larger and larger factory farms across the San Joaquin Valley, it "tend[ed] to utilize more liquid-based systems to manage ... and store manure. Thus, the shift toward larger dairy cattle and swine facilities since 1990 has translated into an increasing use of liquid manure management systems, which have higher potential CH<sub>4</sub> emissions than dry systems."<sup>16</sup> Each dairy's choice to store its manure in anaerobic conditions is a choice to generate extreme quantities of methane that could easily be mitigated through management methods that do not generate meaningful methane to begin with, specifically pasture-based or through other dry manure management systems.<sup>17</sup> If California dairies do not divest from excessively large herds and liquid manure management, a business choice made for cost efficiency and biogas profit, they will continue to cause devastating and pervasive quality of life impacts on the surrounding majority Latino/a/e communities in the San Joaquin Valley.

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<sup>12</sup> Sophie Barrowman et al., *More Milk, Fewer Farms, and Regional Concentration: Mapping Transformations in California's Dairy Industry*, 115 *Geographical Rev.* 49, 50, 52 (2025); California Dairy & Livestock Database 2.0, California Air Resources Board (Oct. 2025), <https://ww2.arb.ca.gov/california-dairy-livestock-database-cadd>.

<sup>13</sup> Joan A. Casey et al., *Climate Justice and California's Methane Superemitters: Environmental Equity Assessment of Community Proximity and Exposure Intensity*, 55 *ENVTL. SCI. & TECH.* 14746 (2021), <https://pubs.acs.org/doi/full/10.1021/acs.est.1c04328>.

<sup>14</sup> *Id.*; Sarah Brown Blake, *Spatial Relationships among Dairy Farms, Drinking Water Quality, and Maternal-Child Health Outcomes in the San Joaquin Valley*, 31:6 *PUB. HEALTH NURSING* (2014).

<sup>15</sup> Casey et al., *supra* note 13 at 14753.

<sup>16</sup> EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks, *supra* note 14 at 5-12–5-13.

<sup>17</sup> See CA Food & Agri Code § 412(b)(1) ("Nondigester dairy methane management strategies include, but are not limited to, scrape conversion, open solar drying and composting of manure onsite, conversion of dairy operations to pasture-based management, and solid separation technologies.").

The environmental injustice that large dairies perpetuate across the San Joaquin Valley also corresponds to communities' civic engagement, "as marginalized communities may be vulnerable to siting of environmental hazards due to the lack of political power and limited resources to engage in regulatory decision-making or challenge facility permits."<sup>18</sup> Indeed, as CARB has acknowledged, "the most extreme concentrations of environmental hazards tend to be located in communities where the people have the least political, social, and economic resources to prevent or mitigate these risks."<sup>19</sup> Despite these odds, grassroots organizations like Defensores continue to defend the San Joaquin Valley from the pollution that has tragically become synonymous with it. Yet, even while CARB has repeatedly solicited such environmental justice perspectives, the agency's lack of meaningful direct regulation of the dairy industry has forestalled any improved quality of life or health outcomes for these vulnerable residents.

CARB is well aware of the litany of pollutants generated by methane-intensive factory farming and the harms they inflict on San Joaquin Valley residents. Commenters highlight them here to stress that CARB's SB 1383 rulemaking cannot achieve equitable outcomes if it ignores the full scope of environmental impacts and, specifically, if it rewards practices exacerbating air and water pollution as it does under other program models that aggressively incentivize factory farm biogas:

### **1. *Ammonia and Fine Particulate Matter (PM2.5)***

Ammonia is a toxic, odorous gas released by dairy and livestock manure. At prolonged exposure levels, ammonia results in respiratory distress, throat, eye, and lung irritation, and lung damage.<sup>20</sup> In the San Joaquin Valley air basin, large livestock operations are responsible for 57% of ammonia emissions.<sup>21</sup> Incentivizing dairies to store manure in anaerobic digesters for biogas production leads to increased ammonia emissions, as the resulting digestate contains higher ammonia than non-digested manure.<sup>22</sup>

Ammonia reacts with nitrogen oxides (NO<sub>x</sub>) to form ammonium nitrate, a fine particulate matter (PM<sub>2.5</sub>) that is the most prevalent form of PM<sub>2.5</sub> in the San Joaquin Valley.<sup>23</sup> PM<sub>2.5</sub> is associated with cardiac and pulmonary harms, including premature deaths in individuals with heart or lung conditions, heart attacks, irregular heartbeat, worsened asthma, reduced lung

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<sup>18</sup> Casey et al., *supra* note 13 at 14753.

<sup>19</sup> CARB, Environmental Justice Dairy Workgroup #1 Presentation, 24 (May 2018), <https://perma.cc/72ND-A6ZS>.

<sup>20</sup> Agency for Toxic Substances & Disease Registry, Center for Disease Control & Prevention, *Medical Management Guidelines for Ammonia*, <https://perma.cc/G8J6-TWT2> (last visited May 24, 2026).

<sup>21</sup> EPA, Technical Support Document, EPA Evaluation of PM<sub>2.5</sub> Precursor Demonstration, San Joaquin Valley PM<sub>2.5</sub> Plan for the 2006 PM<sub>2.5</sub> NAAQs (Feb. 2020), available at <https://downloads.regulations.gov/EPA-R09-OAR-2019-0318-0005/content.pdf>.

<sup>22</sup> Michael A. Holly et al., *Greenhouse Gas and Ammonia Emissions from Digested and Separated Dairy Manure During Storage and After Land Application*, 239 *Agric., Ecosystems & Env't* 410, 417 (2017).

<sup>23</sup> San Joaquin Valley Air Pollution Control Dist., 2018 Plan for the 1997, 2006, and 2012 PM<sub>2.5</sub> Standards, 3-2 to 3-3 (Nov. 15, 2018), <https://perma.cc/6GMN-J3MC>.

function, and long-term lung diseases such as cancer.<sup>24</sup> The Valley is in Serious Nonattainment across various federal PM2.5 standards<sup>25</sup> and multiple cities including Bakersfield, Delano, Visalia, Hanford, Fresno, and Corcoran rank in the most polluted cities in the country for short-term<sup>26</sup> and long-term PM2.5 exposure.<sup>27</sup> As CARB itself has acknowledged, PM2.5 exposure “is responsible for about 1,200 cases of premature death in the Valley each year.”<sup>28</sup>

## 2. Ozone

According to California’s own state and regional air quality agencies, dairies are one of the major sources of volatile organic compounds (“VOCs”) in the San Joaquin Valley. In sunlight, VOCs combine with NOx to create ozone, a criteria pollutant that causes severe harm to the respiratory system and contributes to increased risk of asthma, especially in children.<sup>29</sup> Children who live in the San Joaquin Valley are twice as likely to be diagnosed with asthma before the age of 18 compared to the national average.<sup>30</sup> The Valley is designated Extreme Nonattainment for the 1997 8-hour ozone standard, the 2008 8-hour ozone standard, and the 2015 8-hour ozone national ambient air quality standards.<sup>31</sup> Multiple cities including Bakersfield, Delano, Visalia, Hanford, Fresno, and Corcoran rank in the top five ozone-polluted cities in the country.<sup>32</sup>

## 3. Nitrogen oxides (NOx)

Dairies also emit large amounts of NOx, which react with ammonia and other air pollutants to create ozone and PM2.5. Dairy NOx emissions originate from several activities including feed for dairy cattle and manure application on crop fields, which contributes to increasing the concentration of ozone and PM2.5 in the atmosphere.<sup>33</sup> As CARB is already well aware, the San Joaquin Valley has substantial amounts of NOx emissions which are not accounted for in the emissions inventory.

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<sup>24</sup> *State of the Air 2026*, *supra* note 7 at 30; S. Basith, B. Manavalan et al., *The Impact of Fine Particulate Matter 2.5 on the Cardiovascular System: A Review of the Invisible Killer*, 12 *Nanomaterials* 2656 (2022), <https://doi.org/10.3390/nano12152656>

<sup>25</sup> San Joaquin Valley Unified Air Pollution Control Dist., *Ambient Air Quality Standards & Valley Attainment Status*, <https://ww2.valleyair.org/air-quality-information/ambient-air-quality-standards-valley-attainment-status/> (last visited May 29, 2026).

<sup>26</sup> *State of the Air 2026*, *supra* note 7 at 21. In 2026, Bakersfield-Delano ranked 3rd, Visalia ranked 5th, and Fresno-Hanford-Corcoran ranked 6th.

<sup>27</sup> *Id.* at 24. In 2026, Bakersfield-Delano ranked 1st, Fresno-Hanford-Corcoran ranked 4th, and Visalia ranked 5th.

<sup>28</sup> CARB, *Clean-Air Plan for San Joaquin Valley First to Meet All Federal Standards for Fine Particle Pollution*, (Jan. 24, 2019), <https://perma.cc/9QHT-QWTP>.

<sup>29</sup> *State of the Air 2026*, *supra* note 7 at 33–35.

<sup>30</sup> Harriet Blair Rowan, *Dirty Air and Disasters Sending Kids to the ER for Asthma*, Cal. Healthline (Oct. 4, 2018), <https://perma.cc/Q9SA-S5PE>.

<sup>31</sup> *Ambient Air Quality Standards & Valley Attainment Status*, *supra* note 25.

<sup>32</sup> *State of the Air 2026*, *supra* note 10 at 16. In 2026, Visalia ranked 2nd, Bakersfield-Delano ranked 3rd, and Fresno-Hanford-Corcoran ranked 5th.

<sup>33</sup> Leadership Counsel for Justice and Accountability, *supra* note 10 at 3.

#### 4. Nitrate Pollution and Water Quality

Dairy factory farms also cause nitrate groundwater pollution across the San Joaquin Valley, with ninety-four percent of this pollution caused by the application of dairy waste to fields.<sup>34</sup> Nitrate is a harmful pollutant that degrades drinking water quality and is associated with increased risk of thyroid disease, birth defects, premature births, and colorectal cancer.<sup>35</sup> Nitrates in drinking water are also associated with increased cases of the potentially fatal blood condition methemoglobinemia in infants, or “blue baby syndrome,” since they affect the red blood cells’ ability to carry oxygen.<sup>36</sup> While nitrate contamination of drinking water is widespread in California, the worst contamination is in the eight counties that comprise the San Joaquin Valley.<sup>37</sup> Within the Valley, the most severe contamination is in Latino/a/e-majority areas.<sup>38</sup> As a result, many San Joaquin Valley residents are forced to buy bottled water to protect the health of their families.<sup>39</sup>

Biogas production from factory farm waste exacerbates this problem. The waste left over after gas production, known as “digestate,” must still be managed and disposed of. But digestate poses unique and elevated pollution risks compared with undigested manure, exacerbating the risk of nitrate pollution contaminating drinking water. This is because digestate behaves differently when disposed of on fields than undigested manure due to its altered chemistry. As the U.S. Department of Agriculture’s Conservation Practice Standard for anaerobic digesters explains, biogas production does not remove nitrogen or phosphorus but instead concentrates them in the resulting digestate and makes them more soluble, and thus more likely to pollute local surface and ground waters.<sup>40</sup>

It is unacceptable that communities must rely on bottled water and face ongoing drinking water contamination while CARB rewards them for making a public health problem even worse through misguided biogas policies.

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<sup>34</sup> USDA, Nat. Res. Conservation Serv., Conservation Practice Standard Code 366: Anaerobic Digester (Aug. 2023); Harter, T. et al, *Dairies and other sources of nitrate loading to groundwater*, Task Report 6, SWRCB Agreement Number 04-184-555, University of California, Davis, 10 (Aug. 2013), <https://perma.cc/AU86-UA94>. (“Animal agriculture, and particularly dairy production, is a dominant and widespread source of nitrogen in the environment.”).

<sup>35</sup> Environmental Working Group, *Nitrate in Drinking Water* (Apr. 2020), <https://perma.cc/9KTA-7AYP>

<sup>36</sup> JoAnn Burkholder et al., *Impacts of Waste from Concentrated Animal Feeding Operations on Water Quality*, 115 Env’t Health Persps. 308, 310 (2006).

<sup>37</sup> Weir Schechinger, *supra* note 8.

<sup>38</sup> *Id.*

<sup>39</sup> Zoe Rosenberg, *Tulare County Dairy Farms Are Poisoning Latino Communities*, DxE (May 20, 2022), <https://perma.cc/7CYV-U54M>.

<sup>40</sup> USDA, Nat. Res. Conservation Service, CPS 366: Anaerobic Digester (Aug. 2023), at 8–9, [https://www.nrcs.usda.gov/sites/default/files/2023-08/366\\_NHCP\\_CPS\\_Anaerobic\\_Digester\\_2023.pdf](https://www.nrcs.usda.gov/sites/default/files/2023-08/366_NHCP_CPS_Anaerobic_Digester_2023.pdf) (“[L]and application of digester effluent, compared with fresh manure, may have a higher risk for both ground and surface water quality problems. Compounds such as nitrogen, phosphorus, and other elements become more soluble due to anaerobic digestion and therefore have higher potential to move with water.”).

## 5. *Hydrogen Sulfide*

Hydrogen sulfide is the odorous gas responsible for the rotten egg odor from dairies. It causes respiratory, ocular, and neurological disorders at low-level exposure<sup>41</sup> and fatalities at high levels.<sup>42</sup> Significant hydrogen sulfide emissions occur during the methane-intensive anaerobic storage of manure. Communities that live closest to dairies report headaches and nausea due to the pervasive stench of hydrogen sulfide.<sup>43</sup> Members of Defensores report that the smell lingers on their skin and clothes and attracts flies to their homes.<sup>44</sup> Ms. Arévalo has reported to CARB how the smell of manure is especially overwhelming during hot summer days; the odor has intensified following the installation of multiple digesters in her Pixley community despite being presented as a solution to excessive manure.<sup>45</sup> These quality of life impacts will only worsen if CARB's policies continue to incentivize dairies to expand and concentrate their herds to produce factory farm biogas.

### **C. SB 1383 rulemaking should prioritize environmental justice by prioritizing the most methane intensive and polluting dairies first**

To truly make environmental justice the focal point of SB 1383 rulemaking, CARB should prioritize instituting mandatory requirements for the most methane intensive, most polluting dairies including large-scale dairies in the San Joaquin Valley. CARB's approach must also be holistic, as affected community members urgently need reductions of the other pollutants that large-scale dairies generate alongside methane.

First, to ensure the emissions reductions are measurable, the agency should immediately require the most polluting dairies to conduct facility-level monitoring and data reporting to end reliance on modeling estimates. On their own, modeling estimates may seriously underreport methane and other pollutant emissions, overestimate mitigation interventions, and ultimately undermine the dairy sector's ability to achieve required reductions.<sup>46</sup>

Second, SB 1383 regulations must also encourage practices that prevent methane generation in the first place and alleviate climate, air, and water pollution. For instance, the ongoing reduction of the dairy herd in California should complement a regulatory approach that halts the

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<sup>41</sup> Lewis, R. Jeffrey and G. Bruce Copley, "Chronic low-level hydrogen sulfide exposure and potential effects on human health: a review of the epidemiological evidence." *Critical Reviews in Toxicology* 45, no. 2 (2015): 93-123.

<sup>42</sup> Fetra J. Andriamanohiarisoamanana, Yushi Sakamoto, Takaki Yamashiro, Seiichi Yasui, Masahiro Iwasaki, Ikko Ihara, Osamu Tsuji & Kazutaka Umetsu, *Effects of Handling Parameters on Hydrogen Sulfide Emission from Stored Dairy Manure*, 154 J. Env't Mgmt. 110 (2015). doi: 10.1016/j.jenvman.2015.02.003.

<sup>43</sup> See Defensores Community Dairy Letter (Scoping Plan) (June 23, 2022), <https://perma.cc/PP6P-CVFP>.

<sup>44</sup> *Id.*

<sup>45</sup> *Id.*

<sup>46</sup> The Climate Change & Animal Agriculture Legal Initiative, part of the Law, Environment & Animals Program at Yale Law School et al., *Comments on the Environmental Assessment Worksheet for the West River Dairy Expansion*, 6-7 (May 7, 2026), <https://perma.cc/2MWU-W3VZ>.

concentration, consolidation, and expansion of dairies to unsustainable levels to ensure that attrition-based emissions reductions occur in an equitable way that does not burden environmental justice communities.

SB 1383 should include effective and equitable enforcement mechanisms that prioritize enforcement at the most intensive, most polluting facilities first. SB 1383 enforcement regulations are reasonably necessary to effectuate the statute's purpose of achieving its 2030 emissions reductions target through requirements on manure management operations.<sup>47</sup> Without these mechanisms, any regulations CARB develops will amount to mere recommendations, such that the largest dairies will lack incentive to comply and the 2030 target will remain out of reach. This should include fines against dairies that repeatedly fail to meet regulatory requirements, to go at least partially into an environmental justice remediation fund. CARB should also employ injunction-type mechanisms against dairies seeking to consolidate or expand their herd sizes, particularly large San Joaquin Valley dairies or those in violation of applicable manure management requirements.

To ensure environmentally just outcomes and put California on track to meet its 2030 target, CARB must adopt and implement enforceable regulations that promote dairying practices far different from the practices they largely have encouraged to date. Instead of encouraging the most polluting practices, it is time for CARB to correct course and encourage practices that prevent methane generation, prevent concentration of manure that leads to groundwater pollution, and address air pollution and nuisance odor worsened by increased concentration of herds and biogas production.

### **III. SB 1383 Rulemaking Must Take Priority over Dairy Digester Subsidies and De-Commodify Methane**

#### **A. Californians should not pay for false solutions that exacerbate pollution**

CARB's approach to manure methane emissions thus far has been characterized by very expensive, questionably effective factory farm biogas production that exacerbates local pollution

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<sup>47</sup> Cal. Health & Safety Code § 39730.7(b)(1). An agency must promulgate regulations that effectuate the legislature's objectives and are reasonably necessary to achieve those objectives. In doing so, an agency is not limited to the exact provisions of a statute and has implied authority to enforce its mandates as necessary to achieve the legislature's objectives. See *California Chamber of Com. v. State Air Res. Bd.*, 10 Cal. App. 5th 604, 621 (2017); *Western Oil & Gas Assn. v. Orange Cnty Air Pollution Control Dist.*, 14 Cal. 3d 411 (1975) (reasoning that CARB possessed certain implied authority because without it CARB would have no realistic way of achieving the reductions the legislature empowered it to reduce).

in the San Joaquin Valley. That myopic focus on gas production, instead of better waste management, is not an effective way to deal with manure methane emissions.

The state must not put the cost of the livestock industry's methane problem on the general public, much less on Californians already bearing the brunt of pollution from large-scale livestock operations. Moreover, Californians must not be asked to foot the bill for methane management techniques that exacerbate pollution and downgrade their quality of life. As noted above, large-scale dairy operations contribute to groundwater pollution, air pollution, odor, and flies. Effective regulation will chart a path to improve, not worsen, environmental impacts of dairies and environmental outcomes for communities in regions where dairies concentrate. For instance, multiple analyses have conveyed the risk that livestock biogas incentives encourage livestock operators to expand their herds and supercharge consolidation<sup>48</sup> and illustrate a correlation between biogas incentives and consolidation and herd size expansion.<sup>49</sup> As herd sizes grow, so too does air pollution, water pollution, odor and other nuisances. Additionally and relatedly, consumer- and tax-payer-paid subsidies for factory farm gas encourage the production of the flush manure systems discussed above—a practice that leads directly to groundwater pollution, drinking water pollution, air pollution, and odors.<sup>50</sup> CARB has an opportunity now to replace its current approach of asking tax payers and consumers to subsidize the growth of factory farms and their related pollution with an equitable and effective policy that promotes both economic and environmental fairness.

### **B. Subsidies for factory farm gas have significant cost impacts to Californians**

Californians have already paid over a billion dollars to build up and prop up the production of biogas at California dairies through their purchase of gasoline for transport, utility bills, and taxes. Factory farm biogas production will continue to rely on subsidies and manufactured markets subsidized by Californians because it cannot sustain itself without ongoing and significant handouts.

Soon after the passage of SB 1383 and through the development of the state's Short Lived Climate Pollutant Strategy in 2016 and 2017, state representatives and industry proponents alike

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<sup>48</sup> Ruthie Lazenby, *Mitigating Emissions from California's Dairies: Considering the Role of Anaerobic Digesters in Mitigating Emissions from California Dairies*, UCLA School of Law Emmett Institute on Climate Change and the Environment (Jan. 2024), <https://perma.cc/F3CG-5VFF>; Kevin Fingerman et al., *Risk of crediting carbon offsets in low carbon fuel standards: lessons learned from dairy biomethane*, Energy Policy, Volume 206 (Nov. 2025), <https://www.sciencedirect.com/science/article/pii/S0301421525002459>.

<sup>49</sup> Varun Magesh et al., *Do Methane Mitigation Incentives Intensify Livestock Production? Evidence from California, 2016-2025* (2025), <https://perma.cc/3N95-4AVL>; Chloë Waterman and Molly Armus, *Biogas or Bull\*\*\*\*? The Deceptive Promise of Manure Biogas as a Methane Solution*, Friends of the Earth (2024), <https://perma.cc/4K4C-DJDK>; Comment submitted by Food & Water Watch et al. to Dairy Sector Workshop, California Air Resources Board (Oct. 2024), <https://perma.cc/LS2U-X9XQ>.

<sup>50</sup> See Section II *supra*.

conveyed that state subsidies of \$500 million would be necessary to reach the 2030 methane target for livestock methane.<sup>51</sup>

Since 2015, the state and its constituents have provided well over a billion dollars in subsidies for the development and deployment of livestock biogas in the form of grants through the Dairy Digester and Research Development Program (\$230 million),<sup>52</sup> utility rates and rate-payer funds (\$383 million),<sup>53</sup> and hundreds of millions more<sup>54</sup> from gas customers through the Low Carbon Fuel Standard. Those sums do not even include the far less generous grants and subsidies to other methane reduction programs, such as the Alternative Manure Management Program. In other words, Californians have more than met the plea of agricultural and biogas industry stakeholders and government officials to subsidize methane emissions reduction through the production of biogas.

However, agricultural and biogas industry representatives are not satisfied with the well over \$1 billion in subsidies that the industry has already enjoyed, much less the \$500 million they originally requested. More consumer- and taxpayer-paid subsidies are necessary, it turns out, and always will be to ensure industry profits. Industry leaders have continued to say that biogas projects will shutter without the lucrative subsidies of the LCFS, paid for by California consumers; livestock biogas developers continue to seek additional money from California ratepayers to subsidize biogas development, transport and procurement; and industry representatives continue to advocate for publicly-funded grants to subsidize biogas development.<sup>55</sup>

Biogas is far more costly to produce than conventional fuel and is not competitive without forced markets and massive subsidies

Livestock biogas is not a cost-effective fuel. It is far more costly to produce than conventional fuel. Accordingly, programs that require its sale must force consumers or taxpayers to pay for the difference between the costly biogas and conventional fuel through subsidies. While the city gate price of conventional natural gas in California was a relatively high \$5.79<sup>56</sup> in February of this

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<sup>51</sup> Findings and recommendations. Subgroup 2: Dairy Digesters Senate Bill 1383 Working Group, 3 (October 2018), <https://perma.cc/QK2D-A3TQ>; *Short-Lived Climate Pollutant Reduction Strategy*, California Air Resources Board, 32 (Mar. 2017), <https://perma.cc/4X3V-W3EB>.

<sup>52</sup> California Department of Food and Agriculture Dairy Digester Research and Development Program – Program-Level Data (Mar. 2026), <https://perma.cc/FBK7-9YLM>.

<sup>53</sup> Donovan Wakeman and Kevin Fingerma, *Waste stream to revenue stream: calculating the costs and climate impact of California's investments in dairy digester infrastructure*, 9 (2023), <https://perma.cc/WA6Q-FKCT>.

<sup>54</sup> *Id.* at 7. As of 2023 an estimated \$440 million dollars had flowed to California livestock biogas producers through the Low Carbon Fuel Standard program.

<sup>55</sup> Agricultural Energy Consumers Association, *Californians need an AFFORDABLE reauthorization of Cap & Trade*, <https://perma.cc/FPY8-XUYG> (last visited May 29, 2026); Agricultural Council of California, *Greenhouse Gas Reduction Fund Ag Coalition Requests* (May 2025), <https://perma.cc/5GEK-5KVP>; Senate Bill 919 (Grayson) (2026) Committee Analysis, Senate Committee on Energy, Utilities, and Communications (Apr. 19, 2026), [https://leginfo.legislature.ca.gov/faces/billAnalysisClient.xhtml?bill\\_id=202520260SB919](https://leginfo.legislature.ca.gov/faces/billAnalysisClient.xhtml?bill_id=202520260SB919).

<sup>56</sup> Per thousand cubic feet of gas.

year,<sup>57</sup> the cost of producing gas from dairy manure ranged from \$23/mmBTU to well over \$100 dollars/mmBTU in 2015 according to a 2016 study.<sup>58</sup> The same study found that bringing the *cheapest* first billion cubic feet of dairy biogas to market would cost the equivalent of an RNG price of \$33.50/mmBTU in 2015 dollars.<sup>59</sup> The relative cost of production and deployment goes up as volume increases and becomes harder to reach.

A similar analysis found the cost of producing dairy gas to be approximately \$930–\$1130 per milking cow per year, depending on the transport costs of the gas, while the value of the gas produced based on the value of conventional gas is only \$128 per milking cow per year assuming a price of approximately \$7 per thousand cubic feet of gas.<sup>60</sup> Eliminating capital costs, the analysis found that production of dairy biogas costs approximately \$440–\$640 per milking cow per year, compared to an estimated value of \$128 per milking cow per year for the gas produced.<sup>61</sup> According to this analysis, the cost of producing the fuel exceeds the value of the fuel approximately four fold, even if we exclude the high capital costs of building manure digesters and related infrastructure.

While a significant amount of the high cost of dairy natural gas is attributable to capital costs necessary for the capture and transport of gas, a significant portion is attributable to ongoing operational costs associated with conversion of manure to gas, upgrading gas, and transporting gas.

There is simply no way to encourage the production and procurement of this fuel without passing the excessive costs of production on to consumers or taxpayers through mandating the purchase of such fuels or significantly subsidizing their production.

California’s approach of utilizing incentives to pay for the production and procurement of factory farm biogas comes at a huge cost. Not just to the environment but also to the pocket-books of Californians. Fair and effective regulation must address methane pollution and other contaminants while curbing the inequitable practice of passing the cost of pollution on to consumers and taxpayers.

#### **IV. SB 1383 Rulemaking Must Ensure There Is No Double Counting of Methane Reductions**

CARB must ensure that it accurately accounts for dairy and livestock sector emissions while tracking progress toward the SB 1383 target by avoiding any double counting of reductions

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<sup>57</sup> *Natural Gas Prices*, US Energy Information Association, <https://perma.cc/XR7V-26KT> (last visited May 29, 2026).

<sup>58</sup> Amy Myers Jaffe, *Final Draft Report on The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute*, STEPS Program, Institute of Transportation Studies (Prepared for the California Air Resources Board and the California Environmental Protection Agency) 58 (June 2016), <https://perma.cc/3WRA-7QWK>.

<sup>59</sup> *Id.* at 56.

<sup>60</sup> Aaron Smith, *The Value of Methane from Cow Manure* (Apr. 2023), <https://perma.cc/2EAC-9TZ5>.

<sup>61</sup> *Id.*

assigned to Cap-and-Invest, LCFS avoided methane crediting (*i.e.*, offset crediting), or any other state or federal program. When CARB issues these financial instruments to a factory farm biogas project, they represent the act of capturing methane emissions and make it a transferable commodity. In this transaction, the “environmental attribute” is passed from seller to buyer. When the credits are factory farm biogas-based, this lowers the fossil fuel sector’s reported emissions but *not* the dairy sectors’.

Commenters and many others have been calling on CARB for several years to rescind its avoided methane crediting policy for factory farm biogas under the LCFS for, among many other reasons, this very issue. SB 1383 requires CARB to “adopt regulations to reduce methane emissions *from livestock manure management operations and dairy manure management operations*, consistent with this section and the strategy, by up to 40 percent below the dairy sector’s and livestock sector’s 2013 levels by 2030.”<sup>62</sup> But when a large dairy produces methane by feeding its waste into a digester, captures some of that methane to generate transferable credits, and sells those credits for use by a fossil fuel company to meet its own legal obligations — those emissions are locked into the dairy’s climate footprint and thus the dairy sector’s as well. Thus, CARB is double counting any such reductions if it counts them toward SB 1383 progress once the mitigation activity is sold and claimed by an entity in the fossil fuel sector.

CARB’s myopic focus on avoided methane crediting under the LCFS despite its duty to reduce those emissions *in the dairy sector* with direct regulation starting in 2024 under SB 1383 has created a problem it must now fix. As CARB works to build a regulatory framework for direct regulation of manure methane emissions, it must recognize this inherent tension between offset mechanisms like avoided methane crediting under the LCFS and its duties under SB 1383. With the generous runway granted by the Legislature to the dairy industry in SB 1383 having elapsed and the dairy industry on track to fall far short of a 40% reduction in manure methane emissions, CARB must use its SB 1383 authority to rein in the excessive, counterproductive incentivization of polluting practices through offset crediting schemes and refocus on mandated reductions that are in fact attributable to the dairy sector as SB 1383 requires and that could have myriad co-benefits for California communities living near large dairies.

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<sup>62</sup> Cal. Health & Saf. Code § 39730.7(b)(1).

## **Commenters' Responses to CARB's Specific Information Solicitation Questions:**

Commenters offer the following initial responses to CARB's specific questions posed in its information solicitation:

### **1) What animal characteristic data (e.g., herd size, breed, age, diet, excretion rate) are most critical for accurate methane estimation?**

A: CARB should not estimate methane emissions; instead, CARB should require facility-level, real world emissions monitoring under SB 1383 to ensure verifiable reductions. CARB should make all monitoring data publicly available, including facility-level details.

### **2) What manure management data (e.g., deposition, collection, separation, treatment) are most important to better understand and quantify emissions and the effectiveness of emissions reduction strategies?**

A: CARB should collect information on all stages of manure management at California dairy and livestock operations to understand what practices on the ground are leading to the emissions outcomes documented by facility-level monitoring. Identifying what practices are the biggest culprits and those that have the least air, water, and climate polluting profile should inform CARB's proscriptive requirements under SB 1383.

But as Commenters explained above, CARB already has voluminous and uncontroverted data demonstrating which practices contribute the most air, water, and climate pollution as well as obvious and longstanding practices that simply do not generate methane pollution in the first place.

### **3) Are there gaps in regional or facility-level data availability that hinder accurate tracking of progress in reducing methane emissions?**

A: Yes. CARB should fill these gaps by requiring facility-level, real world, publicly available emissions monitoring under SB 1383 to ensure verifiable reductions.

### **4) Are there facility-level data sources that CARB could use to further inform methane abatement strategies, emissions modeling, or future regulatory designs?**

A: CARB should not estimate methane emissions with modeling; instead, CARB should require facility-level, real world, publicly available emissions monitoring under SB 1383 to ensure verifiable reductions. But to inform abatement strategies and future regulatory design CARB should utilize on-site monitoring, satellite-based emissions monitoring to identify facility-level

emissions,<sup>63</sup> and the data already collected showing that installing anaerobic digesters at large dairies to produce biogas risks ongoing “super emitter” events at those operations.<sup>64</sup>

**5) Were dairy and livestock operations required to report information to CARB, what types of data should be reported and at what level of detail and frequency?**

A: CARB should require facility-level, real world, publicly available emissions monitoring and reporting on a quarterly basis under SB 1383 to ensure verifiable reductions. CARB should also require dairies to report actual herd size, manure generation, and digestate disposal practices on a quarterly basis.

CARB should additionally require reporting of broader environmental performance metrics in coordination with other agencies such as State and Regional Water Boards to monitor water and air quality. This would enable CARB to ensure that methane mitigation efforts prompted by SB 1383 improve, or at least do not worsen, other environmental conditions. At a minimum, this should include monitoring water and air quality at dairies, at biogas production sites, and at raw manure and digestate handling and disposal sites.

**6) What role can technologies play in facilitating data collection (e.g., radio frequency identification (RFID) tags, manure flow and storage sensors, remote sensing)?**

A: CARB should require facility-level, real world, publicly available emissions monitoring under SB 1383 to ensure verifiable reductions. This could be accomplished with established monitoring methods, such as optical gas imaging.<sup>65</sup> CARB should also utilize satellite-based emissions monitoring to identify facility-level emissions and verify on-site monitoring results. Methane tracking satellites may make top-down facility-level monitoring of large-scale, confined animal operations more feasible.

**7) Are there examples of organizations (e.g., cooperatives or other supply chain points, non-profits or private companies) that collect or aggregate facility-level data for reporting purposes?**

A: CARB should not rely on aggregate data; instead, CARB should require facility-level, real world emissions monitoring and data collection under SB 1383 to ensure verifiable reductions and environmental improvements.

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<sup>63</sup> E.g., Carbon Mapper, *Science & Technology*, <https://carbonmapper.org/work/science> (last visited May 29, 2026).

<sup>64</sup> Food & Water Watch, *The Proof Is in the Plumbing: Mega-Dairies with Digesters Continue to Spew Methane* (Oct. 2025), <https://perma.cc/TX2L-2P4E>.

<sup>65</sup> See *Cut Methane Campaign: Filming Methane Pollution from the Oil and Gas Sector*, Clean Air Task Force, <https://perma.cc/VW9F-2XEM> (last visited May 2026) (describing optical gas imaging as “a quick and easy way to identify the sources of emissions”);

**8) Are there existing programs or mechanisms for reporting in a way that is efficient and accessible for operators that could serve as suitable models?**

A: No, CARB will need to develop an SB 1383 reporting system that is comprehensive and transparent. Other reporting models, such as those associated with the LCFS and biogas pilot programs administered by the Public Utilities Commission, lack transparency and thus would not meaningfully verify reductions under SB 1383 or other necessary data. Other reporting mechanisms also rely on modeling and estimations for reporting project performance without sufficient real world verification. For example, CARB fails to take into account the full lifecycle emissions of factory farm biogas operations under the LCFS, a flaw that would significantly undermine any claimed reductions under SB 1383.

Furthermore, a recent analysis of California’s regulation of factory farm water pollution by Stanford’s Environmental & Natural Resources Law and Policy Program found that poor oversight and gaps in the regulatory regime mean that factory farms “underreport the waste they produce and fail to account for the waste that they do report producing.”<sup>66</sup> This includes inadequate reporting of manure and process wastewater generation.<sup>67</sup> Those findings underscore that existing programs and mechanisms are systemically flawed and do not allow for adequate oversight.

**9) What factors should CARB consider in evaluating whether a data source is appropriate to use to calculate annual emissions under the GHG Inventory?**

A: CARB should only rely on real world, facility-level, publicly available monitoring data including satellite-based, facility-specific monitoring data and other proven technologies when appropriate. Estimations and modeling have proven misleading and ineffective to establish appropriate baselines and to assess actual emissions reductions at large dairies in California.

**10) Is the facility-level herd size data in the California Dairy and Livestock Database (CADD) sufficiently comprehensive and reliable for use in the GHG Inventory?**

A: No, the CADD relies on unreliable sources of data or makes assumptions. The CADD primarily relies on reporting data collected by Regional Water Quality Control Boards and then attempts to use other sources to fill gaps. This includes looking to air district permits that do not contain accurate data about critical variables such as actual herd size.

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<sup>66</sup> Zoe Robertson et al., *Confined Animal Facility Permitting and Reporting Under the Porter-Cologne Water Quality Control Act: An Analysis of Regional Board Activities*, 10 (Feb. 2026), <https://perma.cc/4V79-CXJB>.

<sup>67</sup> *Id.* at 27.

As expected given this reliance on dubious data sources, Commenters have identified discrepancies in the CADD data. For example, as discussed in our comments on the Dairy Sector Workshop in 2024, we noted that several dairies in Tulare County reported different data as part of the county's reporting program than what appears in the CADD. Hettinga Farms reports 5,942 cows in the CADD data for 2022, but 6,671 cows per Tulare county data in 2022. Avenue 128 Dairy reports 3,519 cows according to CADD data, and 4,252 cows per Tulare County data for the same year. JR Dairy had 5,570 according to the CADD, but 5,714 according to Tulare County data for 2022.<sup>68</sup>

Similarly, several Tulare County dairies show vastly different populations in the CADD data for 2022 compared to populations reported on their LCFS Tier 2 applications.<sup>69</sup> Again, Hettinga Farms, which reports 5,942 cows in the CADD data, reports 6,900 on Tier 2 Pathway Application No. B0543, deemed complete in 2023. Avenue 128 Dairy in Tipton reports 3,519 cows in 2022 according to CADD, and 5,300 according to Application No. B0543. JR Dairy, with 5,570 cows according to CADD, reports 6,300 on Application No. B0543.<sup>70</sup> These discrepancies indicate that the CADD is not a reliable database.

**11) Should CARB incorporate the most recent parameters from the U.S. Environmental Protection Agency (U.S. EPA) Cattle Enteric Fermentation Model data (and any future updates) to calculations of dairy and livestock enteric methane emissions in the GHG Inventory?**

A: No, CARB should not estimate methane emissions; instead, CARB should require facility-level, real world, publicly available emissions monitoring under SB 1383 to ensure verifiable reductions.

**12) Should CARB utilize the most recent U.S. EPA manure distribution data by waste management system (and any future updates) to calculations of dairy and livestock manure emissions in the GHG Inventory?**

A: No, CARB should not estimate methane emissions; instead, CARB should require facility-level, real world, publicly available emissions monitoring under SB 1383 to ensure verifiable reductions.

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<sup>68</sup> Comment submitted by Food & Water Watch et al. to Dairy Sector Workshop, California Air Resources Board (Oct. 2024), <https://perma.cc/LS2U-X9XQ>.

<sup>69</sup> CARB, LCFS Pathway Application, Application No. B0543 (updated Sept. 27, 2024), <https://perma.cc/T3VG-VZSD>.

<sup>70</sup> Food & Water Watch et al., *supra* note 68.

The following analysis from the Climate Change & Animal Agriculture Legal Initiative (part of the Law, Environment & Animals Program at Yale Law School) and partner organizations illustrates why estimations of manure emissions are unreliable as GHG emissions from U.S. animal agriculture are rarely measured directly<sup>71</sup>:

The underlying [EPA] methodology results in conservative estimates, including because the methodology requires assumptions and extrapolations based on representative systems.<sup>72</sup> Compared to models of carbon dioxide emissions from the fossil fuel industry, the EPA's models of nitrous oxide and methane emissions from agriculture are considered far less certain, and the resulting estimates have wide confidence intervals.<sup>73</sup> According to experts, the range of uncertainty between the upper and lower bounds of U.S. agricultural emissions equates to the annual emissions of more than 100 coal-fired power plants.<sup>74</sup>

This high degree of uncertainty is due in part to the use of an inventory-based, “bottom-up” approach, which involves multiplying the number of animals present by “emissions factors” specific to animal types and regions (i.e., estimates of how much gas is produced by each animal over a set period of time).<sup>75</sup> These emission factors are typically derived from controlled studies, representative farm systems, or modeled averages, and are then applied broadly across diverse real-world operations. As a result, the approach simplifies complex biological and environmental processes—such as feed composition, animal health, manure handling, weather conditions, and management practices—into standardized assumptions. Since this “bottom up” approach requires many inputs—each with its own uncertainty—the resulting uncertainty of the total emissions estimate can be more than that of any individual input.<sup>76</sup>

### **13) Should CARB incorporate the most recent U.S. EPA emission factors, including those for cattle diet characterization, typical animal mass, milk production, and nitrogen excretion rates, to calculations of dairy and livestock manure emissions in the GHG Inventory?**

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<sup>71</sup> The Climate Change & Animal Agriculture Legal Initiative, part of the Law, Environment & Animals Program at Yale Law School et al., *Comments on the Environmental Assessment Worksheet for the West River Dairy Expansion*, 6–7 (May 7, 2026), <https://perma.cc/2MWU-W3VZ>.

<sup>72</sup> Item 18 Greenhouse Gas (GHG) Emissions/Carbon Footprint (2025), <https://www.pca.state.mn.us/sites/default/files/p-ear1-16.pdf> (using a combination of EPA-approved methodologies and state-specific tools to estimate emissions from feedlots).

<sup>73</sup> Peter H. Lehner & Nathan A. Rosenberg, *Farming For Our Future; The Science, Law, And Policy Of Climate-Neutral Agriculture*, 54 (2021).

<sup>74</sup> *Id.* at 55.

<sup>75</sup> Matthew N. Hayek and Scot M. Miller, *Underestimates of Methane from Intensively Raised Animals Could Undermine Goals of Sustainable Development*, 16 *Env't Rsch. Letters* 1, 3–7 (2021); Olga Gavrilova et al., *Chapter 10: Emissions from Livestock and Manure Management*, in 2019 Refinement to the 2006 IPPC Guidelines for National Greenhouse Gas Inventories 10.50–10.52 (Eduardo Calvo Buendia et al. eds., 2019), <https://perma.cc/S8MP-8PKY>.

<sup>76</sup> Hayek & Miller, *supra* note 75, at 4.

A: No, CARB should not estimate methane emissions; instead, CARB should require facility-level, real world emissions monitoring under SB 1383 to ensure verifiable reductions.

**14) Given the requirements to deploy cost-effective and technologically feasible mitigation strategies, are there specific methane emissions sources or mitigation strategies that CARB should be prioritizing for the dairy and livestock sector that are not currently deployed?**

A: The overwhelming majority of manure methane emissions at California dairies are the result of deliberate operational choices that were known at the time they were made to cause severe climate emissions. Strategies that avoid this methane generation in the first place are the most effective and long-term solutions. CARB should base its regulatory approach on this reality. This means CARB should look at sources systemically and prioritize mitigation that addresses the underlying reasons why manure methane emissions are so high and stop focusing on incentivizing after-the-fact mitigation efforts like factory farm biogas. Additionally, as discussed above, the cost of developing and sustaining factory farm biogas production and industry's demanded profit margins is extremely expensive. Neither can capital necessary for biogas production be developed without large cash subsidies paid for by utility ratepayers and tax payers, nor can it sustain itself without consumers and rate-payers footing the bill for its otherwise cost-prohibitive production, distribution, and profit margins. In short, CARB's go-to strategy of relying on the production of factory farm biogas as a response to manure methane is ineffective and environmentally disastrous, but also fiscally irresponsible.

CARB should also prioritize responsible herd management such as environmentally sustainable herd sizes and less geographic concentration, especially in the San Joaquin Valley. CARB has relied heavily on attrition in California's statewide herd size to claim reductions in progress toward the SB 1383 target, but this ignores increased intensity in certain communities as the California dairy industry consolidates into fewer, larger factory farms. It also ignores that as smaller-scale dairy operations go out of business, what remains of California's dairy herd moves onto the large factory farms in the San Joaquin Valley that CARB has thus far encouraged to produce as much methane as possible for biogas production. Thus, CARB cannot rely on a gross assessment of statewide herd size and should instead focus on *responsible* herd management to encourage practices that do not produce manure methane in the first place and have myriad co-benefits for California communities.

Finally, CARB must consider the full scope of emissions and pollution in designing an effective policy. For instance, practices that contaminate drinking water sources and require expensive remediation and replacement investments must inform cost efficiency considerations.

**15) For any specific mitigation strategies that CARB should prioritize, what are the potential emission benefits and potential costs?**

A: Prioritizing responsible herd and waste management could largely eliminate manure methane emissions entirely, leaving no risk of methane leakage, loss, flaring, inaccurate reporting, or any of the other concerns that arise with capturing methane pollution and attempting to deploy it after the methane has been generated.

As Commenters explain above, there are significant environmental and public health costs associated with incentivizing biogas production at dairies that CARB must consider.

**16) What completed or ongoing research into emerging or existing methane emissions reduction strategies should CARB be tracking or evaluating?**

A: CARB does not need any further information about manure methane emissions reduction strategies. Manure methane emissions are a problem of the factory farm industry's own making, and largely eliminating those emissions is as simple as managing manure in aerobic systems and at more sustainable quantities. Retaining anaerobic manure management will never be as effective as just not creating the problem to begin with, no matter what "emerging" strategies may come about to Band-Aid the problem after the fact.

**17) What factors should CARB consider in evaluating whether an emerging technology or management practice is a viable methane emissions reduction option (e.g., effectiveness, availability, cost, market adoption rates, others)?**

A: CARB does not need any further information about methane emissions reduction strategies. Manure methane emissions are a problem of the factory farm industry's own making, and largely eliminating those emissions is as simple as managing manure in aerobic systems. Retaining anaerobic manure management will never be as effective as just not creating the problem to begin with, no matter what "emerging" strategies may come about to Band-Aid the problem after the fact. Dairy was produced, sold, and consumed in California for generations before the current factory farm model and the attendant methane pollution problem; thus, we know this would be effective, available, and cost effective.

CARB must not consider strategies—either emerging or existing—that require ongoing subsidies and forced market development for mitigation of methane emissions that should never have been created in the first place. Specifically, technologies that rely on the unnecessary production of methane, and then require costly interventions to reduce that methane, and in turn rely on the public to fund those costly interventions, must be rejected under SB 1383.

**18) Which existing outreach and engagement efforts by state or local agencies have been most effective in garnering collaboration and participation from community, industry, and other public stakeholders?**

A: CARB must start *acting* on the advice and expertise of community stakeholders and its own Environmental Justice Advisory Committee. From the perspective of residents in the San Joaquin Valley, CARB has a practice of hosting numerous “opportunities” for community stakeholders to comment and attend CARB-sponsored events, but then ignores or dismisses what it hears from them. Hollow listening sessions and workshops will never fit the bill no matter how many or in what form CARB hosts them. Instead, community input must be *considered and incorporated* in a meaningful way into CARB’s decision making. In short, CARB would be more effective in garnering collaboration from community members if it stopped prioritizing industry and investor interests over the Californians who live in the communities that will have to bear the burden of CARB’s decisions.

**19) How can interagency coordination between CARB and other State, local, and federal agencies be leveraged to support industry stakeholders in adopting new practices and implementing mitigation strategies?**

A: CARB has already given the dairy industry almost a decade to adopt new practices and implement mitigation strategies and those efforts have fallen short despite over a billion dollars handed out to large dairies and biogas producers.<sup>77</sup> Searching for additional ways to leverage interagency coordination will only be worthwhile if it is to impose and enforce mandatory manure methane reductions.

CARB should leverage SB 1383 regulations to increase interagency collaboration and overall oversight of dairies’ climate, air, and water pollution. These pollution issues are intertwined, and addressing manure methane emissions in effective ways that also improve local air and water quality is critical.

To ensure effective SB 1383 implementation, CARB will need to develop a robust regime for the dairy sector that mandates reductions and requires quarterly reporting of facility-level emissions monitoring to ensure methane reductions.

**20) What other strategies or approaches can agencies leverage, including existing data, tools, platforms, partnerships, etc., to achieve the State climate goals?**

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<sup>77</sup> See *Analysis of Progress Toward Achieving the 2030 Dairy and Livestock Sector Methane Emissions Target*, *supra* note 2 at ES-3–ES-5.

A: CARB should do what SB 1383 requires and implement mandatory reductions in manure methane emissions in the dairy sector to achieve the 2030 target. CARB need only leverage its mandatory duty to impose methane reduction requirements that the dairy sector has not been able to achieve voluntarily over the 8-year, heavily subsidized runway CARB has already given them. And, as explained in Section II.C above, civil enforcement mechanisms are reasonably necessary for CARB to ensure that the larger polluters in the sector actually comply with regulatory requirements.

**21) What objectives should CARB consider in developing methane reduction regulations pursuant to SB 1383?**

A: CARB should consider both the 40% reduction in manure methane as well as additional benefits achievable through more responsible herd and manure management at dairies.

As explained in Section II, CARB should develop SB 1383 regulations through a holistic environmental justice lens that also addresses the impacts of other pollutants on air and water quality.

**22) How should CARB prioritize potential additional environmental and socioeconomic co-benefits in developing a dairy and livestock sector methane regulation pursuant to SB 1383?**

*See response to Question 21 and introductory comments above.*

**23) In addition to the declining total annual statewide methane emissions from the dairy and livestock sector, what metrics are most representative of greenhouse gas improvement at a facility level (e.g., methane intensity per gallon of milk, per head of cattle, absolute reductions from each facility)?**

A: CARB should require facility-level, real world emissions monitoring under SB 1383 to ensure verifiable reductions. That data is the most representative of GHG emissions improvements at the facility level and will contribute to effective state-level emissions reduction and environmental protection.

**24) What types of regulatory mechanisms (e.g., prescriptive requirements on individual dairies, or performance-based requirements that could apply either individually or sector-wide) could CARB consider to ensure that the dairy and livestock sector achieves the 2030 target?**

A: CARB should apply regulatory requirements to individual dairies and verify their performance with real world, on-site, publicly available emissions monitoring. SB 1383 regulations should include both prescriptive requirements on individual dairies and performance-based requirements that apply both individually and sector-wide.

Critically, CARB must stop using regulatory mechanisms that incentivize or encourage the production of manure methane. For example, the LCFS encourages and rewards dairies for producing methane pollution. A similar incentive-based approach would undermine and put out of reach SB 1383's reduction requirement. And as explained above, SB 1383's requirement that emissions reductions are realized in the dairy and livestock sectors means that CARB's regulatory approach must replace the incentives and credit trading CARB has previously relied on. To ensure dairies follow these requirements and are on track to achieve the 2030 goal, civil enforcement mechanisms are crucial, especially for the largest methane producers and sources of air and water pollution.

**25) Which entities within the livestock sector should CARB consider requirements for (e.g., individual dairy and livestock facilities, cooperatives, processors)?**

A: CARB's regulatory approach should advance environmental stewardship at the facility level and across the sector. SB 1383 regulations should apply across the sector to focus on addressing methane emissions and environmental benefits where needed the most. CARB may focus initially on the largest methane producers and sources for air and water pollution such as large-scale dairies in the overburdened San Joaquin Valley.

**26) Should CARB consider regulatory applicability thresholds or exemptions, and if so, under what conditions?**

A: Yes regulatory applicability thresholds and exemptions are important aspects to ensuring that CARB prioritize the most harmful facilities and advance environmental justice. We look forward to working with CARB to determine what exemptions may appropriately apply.

**27) What methods might CARB use to evaluate the risk of economic leakage and out-of-state production shifts?**

A: Assessing the risk of economic leakage and the idea that the dairy industry will leave California in response to SB 1383 regulation will require CARB to look beyond self-serving claims made by dairy sector spokespersons and representatives. They will surely tell CARB that direct regulatory mandates for dairies to address manure methane emissions will cause them to leave the state unless they continue to get the massive subsidies discussed above, such as through the LCFS. But in Commenters' experience, the factory farm industry has a long track record of

making exaggerated and unsubstantiated claims of industry collapse if subjected to common sense regulations in jurisdictions across the country. Whether a large livestock or dairy operation moves locations is dependent on a wide variety of factors such as dairy and meat processing capacity, local feed production, land ownership, and different jurisdictions' regulatory requirements. Further, whether such a facility can successfully complete a move to another location is dependent on additional factors such as resource availability and community resistance to large-scale relocation of factory farm operations. These are some of the factors that CARB must consider in its assessment to determine the true risk of leakage.

**28) In addition to existing grants and incentive programs, what strategies might CARB consider to minimize or mitigate the potential for facility relocation and subsequent emissions leakage?**

A: CARB should prioritize grants that facilitate manure management that reduces methane emission as well as other local pollutants. But as explained above, CARB cannot rely on the LCFS or other offset mechanisms that would result in double counting.

**29) Do any emerging enteric methane reduction strategies meet the requirements described in SB 1383 (i.e., scientifically proven, cost-effective, and does not negatively impact animal productivity, animal health, public health, and are consumer accepted)?**

A: No. Enteric methane reduction strategies such as feed additives have dubious climate benefits and may pose a risk to animal health and public health.

**30) Have enteric methane reduction strategies been broadly accepted by industry and consumers; why or why not?**

A: No. There is a lack of scientific consensus on the effectiveness and safety of enteric methane reduction strategies. Consumers lack sufficient knowledge about feed additives and other strategies to make informed choices about the dairy and meat products they consume.

**In conclusion,** CARB should move forward with robust SB 1383 direct regulations that prioritize sensible, long-term manure methane reductions while also improving environmental conditions in the San Joaquin Valley. We look forward to working with CARB to ensure effective and just regulation of the dairy sector's climate impacts.

Respectfully,

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