ORAL ARGUMENT NOT SCHEDULED

IN THE UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF TEXAS, et al., Petitioners, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND MICHAEL S. REGAN, ADMINISTRATOR, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, Respondents.	No. 22-1031 (and consolidated cases)

MOTION BY THE STATES OF CALIFORNIA, COLORADO, CONNECTICUT, DELAWARE, HAWAII, ILLINOIS, MAINE, MARYLAND, MICHIGAN, MINNESOTA, NEVADA, NEW JERSEY, NEW MEXICO, NEW YORK, NORTH CAROLINA, OREGON, RHODE ISLAND, VERMONT, WASHINGTON, AND WISCONSIN, THE COMMONWEALTHS OF MASSACHUSETTS AND PENNSYLVANIA, THE DISTRICT OF COLUMBIA, THE COUNTIES OF DENVER AND SAN FRANCISCO, AND THE CITIES OF DENVER, LOS ANGELES, NEW YORK, AND SAN FRANCISCO FOR LEAVE TO INTERVENE IN SUPPORT OF RESPONDENTS

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Pursuant to Federal Rule of Appellate Procedure (FRAP) 15(d) and D.C. Circuit Rule 15(b), the States of California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Maine, Maryland, Michigan, Minnesota, Nevada, New Jersey, New Mexico, New York, North Carolina, Oregon, Rhode Island, Vermont, Washington, and Wisconsin, the Commonwealths of Massachusetts and Pennsylvania, the District of Columbia, the Counties of Denver and San Francisco, and the Cities of Denver, Los Angeles, New York, and San Francisco (collectively, Movant-Intervenor States) hereby move the Court for leave to intervene in case number 22-1031 and all consolidated cases in support of Respondents United States Environmental Protection Agency and Michael Regan as Administrator of the United States Environmental Protection Agency.

Petitioners challenge EPA's promulgation of federal greenhouse gas emissions standards for passenger cars and light trucks for model years 2023 through 2026. *See* 86 Fed. Reg. 74,434 (December 30, 2021). Movant-Intervenor States have a compelling interest in these standards, because they are a crucial element of urgently needed efforts to mitigate the substantial and growing adverse effects of climate change in their States. Indeed, the Supreme Court has recognized that States have significant "stake[s]" in the control of these very emissions from these very vehicles. *Massachusetts v. EPA*, 549 U.S. 497, 520

(2007). Movant-Intervenor States seek to intervene in all challenges to EPA's standards to protect those established interests.

Petitioners in Cases No. 22-1031 (State of Texas et al.) and 22-1035 (State of Arizona) do not oppose this motion. Respondents also do not oppose this motion. Petitioners in the remaining cases did not provide a position on this motion.

BACKGROUND

The Clean Air Act requires EPA to prescribe "standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in [the Administrator's] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." 42 U.S.C. § 7521(a)(1). States, including many of the Movant-Intervenor States here, have a long history of intervening in litigation and otherwise urging EPA to rigorously control greenhouse gas emissions from new motor vehicles, *see e.g.*, *Massachusetts*, 549 U.S. at 514, because the transportation sector is a major contributor to the Nation's greenhouse gas emissions. The light-duty vehicles regulated by the greenhouse gas emissions standards at issue here constitute one of the Nation's most significant sources of such emissions, accounting for approximately 17% of total U.S. greenhouse gas emissions.[1]

[1] *See* Comments of States and Cities Supporting EPA's Proposal to Strengthen its Greenhouse Gas Emission Standards for New Light-Duty Vehicles, (continued…)

In 2009, after *Massachusetts* was decided, EPA determined "that greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare," and that new motor vehicles and new motor vehicle engines cause or contribute to that endangerment. 74 Fed. Reg. 66,496, 66,496-97 (Dec. 15, 2009) (Endangerment Finding). The Endangerment Finding triggered a mandatory duty for EPA to regulate greenhouse gas emissions from new motor vehicles. *See* 42 U.S.C. § 7521(a); *see Coalition for Responsible Regulation v. EPA*, 684 F.3d 102, 126 (D.C. Cir. 2012) ("By employing the verb 'shall,' Congress vested a non-discretionary duty in EPA.").

In 2010, EPA promulgated greenhouses gas emissions standards for light-duty vehicles for model years 2012 through 2016. 75 Fed. Reg. 25,324 (May 7, 2010). And, in 2012, EPA finalized greenhouse gas emissions standards for model years 2017 through 2025. 77 Fed. Reg. 62,624 (Oct. 15, 2012). EPA explained that it was responding "to the country's critical need to address global climate change," *id.* at 62,626-27, and it estimated that its standards would prevent "approximately 2 billion metric tons" of greenhouse gas emissions, *id*. at 62,627.

In April 2020, following a change in presidential administrations, EPA revised and dramatically weakened its standards for model years 2021 through

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at 20 (Sept. 27, 2021) (Docket ID EPA-HQ-OAR-2021-0208-0116) (citing U.S. EPA, EPA 430-R-21-005, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019*, (2021)).

2025 and promulgated similarly weak standards for model year 2026. 85 Fed. Reg. 24,174 (April 30, 2020) (SAFE 2). The SAFE 2 standards increased in stringency by approximately 1.5% per year, *id*., which was well below the approximately 5% per year required by the standards promulgated in 2012, *id*. at 25,106. EPA projected that its SAFE 2 standards would increase greenhouse gas emissions by up to 923 million metric tons, *id*. at 24,176, and cause up to 1,000 premature deaths and other adverse health impacts due to increases in criteria pollutant emissions, *id*. at 25,119.

All of Movant-Intervenor States challenged the SAFE 2 standards in this Court. Case No. 20-1145 (and consolidated cases). The Court placed those cases in abeyance when, shortly after his inauguration, President Biden directed EPA to reconsider its SAFE 2 standards. Order, *Competitive Enterprise Institute, et al. v. EPA*, Case No. 20-1145, ECF #1892931 (D.C. Cir. April 2, 2021).

In August 2021, EPA proposed to increase the stringency of its greenhouse gas emissions standards for model years 2023 through 2026. 86 Fed. Reg. 43,726 (Aug. 10, 2021). EPA stated "that in light of the significant contribution of light-duty vehicles to transportation sector greenhouse gas emissions, standards more stringent than those relaxed in the SAFE rule are appropriate under the Clean Air Act." *Id*. at 43,726. EPA's proposal included three alternatives reflecting a range

of stringencies with EPA's preferred standards in the middle between a weaker alternative and a stronger one.

In December 2021, EPA finalized its standards, adopting the standards from its preferred alternative for model years 2023 and 2024 and from its most stringent alternative for model years 2025 and 2026. EPA estimates its new standards will reduce greenhouse gas emissions by 3.1 billion metric tons, 86 Fed. Reg. at 74,437, and will also reduce emissions of particulate matter by 14,701 tons and smog-forming oxides of nitrogen by 60,216 tons by 2050, 86 Fed. Reg. at 74,491-92. Petitioners here seek to vacate these standards, to restore the weaker SAFE 2 standards, and, perhaps, to constrain EPA's ability to set robust vehicular greenhouse gas emissions standards in the future. If Petitioners prevail, harmful emissions that threaten public health and the environment will increase and those increases will be long-lasting, not only because of the longevity of greenhouse gases in the atmosphere, but also because of the longevity of higher-emitting vehicles sold under any weakened standards. Those increased emissions would exacerbate the consequential climate change harms Movant-Intervenor States are already experiencing. Movant-Intervenor States respectfully request that this Court grant their motion to intervene to defend these important standards and EPA's ability to meaningfully control these emissions.

LEGAL STANDARD

Federal Rule of Appellate Procedure 15(d) states that a motion to intervene "must contain a concise statement of the interest of the moving party and the grounds for intervention" and be filed "within 30 days after the petition for review is filed." Because "[i]ntervenors become full-blown parties to litigation, . . . all would-be intervenors must demonstrate Article III standing." *Old Dominion Electric Cooperative v. FERC*, 892 F.3d 1223, 1232 (D.C. Cir. 2018); *see Crossroads Grassroots Policy Strategies v. FEC*, 788 F.3d 312, 316 (D.C. Cir. 2015) (stating "where a party tries to intervene as another defendant, we have required it to demonstrate Article III standing").

This Court also looks to factors analogous to those under Federal Rule of Civil Procedure (FRCP) 24(a), which requires a party to satisfy four factors for intervention as of right:

> (1) timeliness of that application to intervene; (2) a legally protected interest; (3) that the action, as a practical matter, impairs or impedes that interest; and (4) that no party to the action can adequately represent the potential intervenor's interest.

Crossroads Grassroots Policy Strategies, 788 F.3d at 320; *see Massachusetts Sch. of Law at Andover, Inc. v. U.S.*, 118 F.3d 776, 779 (D.C. Cir. 1997) ("[W]e have held that intervention *in* the court of appeals is governed by the same standards as in the district court."). A court may also grant permissive intervention under FRCP

24(b) when a movant makes a "timely application" and the "applicant's claim or defense and the main action have a question of law or fact in common." *See EEOC v. Nat'l Children's Ctr., Inc.*, 146 F.3d 1042, 1045 (D.C. Cir. 1998).

ARGUMENT

I. MOVANT-INTERVENOR STATES ARE ENTITLED TO INTERVENTION AS OF RIGHT

Movant-Intervenor States readily satisfy the requirements for intervention as of right. Movant-Intervenor States have Article III standing, and they meet the requirements for intervention as of right under this Court's precedents and under FRCP 24(a).

A. Movant-Intervenor States Have Article III Standing

To satisfy the requirements of Article III standing, Movant-Intervenor States must demonstrate: (1) that they "have suffered an injury in fact . . . which is [] concrete and particularized, and [] actual or imminent," (2) that there is a "causal connection between the injury and the conduct complained of," and (3) that it is "likely . . . the injury will be redressed by a favorable decision." *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 560-61 (1992). For purposes of intervention to defend an agency's action, causation and redressability are established if the party seeking intervention demonstrates that injury would result from a decision to grant the petition for review. *Crossroads*, 788 F.3d at 316-319.

Here, Movant-Intervenor States would be injured if Petitioners succeed in obtaining vacatur of EPA's greenhouse gas emissions standards promulgated in the Final Rule, because any such decision would increase short- and long-term emissions by weakening the standards applicable to most new vehicles sold in the United States for at least one, and likely more, model years. Movant-Intervenor States would also be injured by a ruling that compromises EPA's ability to reduce these harmful vehicle emissions in the future. *See* 42 U.S.C. § 7521(a).

The administrative record contains abundant evidence of the types of injuries that Movant-Intervenor States would suffer as a result of weakened greenhouse gas emissions standards. *See Sierra Club v. EPA*, 292 F.3d 895, 899-900 (D.C. Cir. 2002) ("In many if not most cases the petitioner's standing to seek review of administrative action is self-evident; no evidence outside the administrative record is necessary for the court to be sure of it."). Movant-Intervenor States have explained that their States and Cities are currently experiencing direct and compounding climate harms that are projected to worsen without deep reductions in anthropogenic emissions of greenhouse gases, such as those from passenger cars and light trucks regulated by the Final Rule.[2] For

[2] *See* Comments of States and Cities Supporting EPA's Proposal to Strengthen its Greenhouse Gas Emission Standards for New Light-Duty Vehicles, at 2-10 (Sept. 27, 2021) (Docket ID EPA-HQ-OAR-2021-0208-0245) ("States Comments").

example, rising temperatures "unequivocally caused"[3] by anthropogenic greenhouse gas emissions contribute to the severity of drought conditions, which are particularly severe in California, where nearly 90% of the State is facing at least extreme drought and about 45% of the State is experiencing exceptional drought;[4] rising temperatures and drier conditions are increasing the frequency and intensity of wildfires in California, Colorado, Oregon, and Washington;[5] and a warmer climate is intensifying costly extreme weather events.[6] Additionally, human-induced climate change leads to sea level rise that submerges sovereign territory in coastal States.[7]

These harms result in the loss of state lands and natural resources as well as increased expenditure of funds by Movant-Intervenor States on, among other

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[3] Richard P. Allan et al., *Climate Change 2021: The Physical Science Basis, Summary for Policymakers, Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* SPM-5 (V. Masson-Delmotte et al., eds. 2021) (Docket ID EPA-HQ-OAR-2021-0208-0245).

[4] *See* States' Comments at 3-6.

[5] *See id.* at 6-8; Decl. of E. Scheehle, California Air Resources Board ¶¶ 21-24.

[6] *See* States' Comments at 8-10; Decl. of G. Auburn, Maryland Department of the Environment ¶ 15.

[7] *See* Decl. of G. Auburn, Maryland Department of the Environment ¶ 14; Decl. of J. Chamberlin, California Department of Parks and Recreation ¶¶ 7-10; Decl. of L. Berry Engler, Massachusetts Executive Office of Energy and Environmental Affairs ¶¶ 8-12; Decl. of E. Fleishman, Oregon Climate Change Research Institute ¶¶ 7, 19-21; Decl. of M. Hammond, Pennsylvania Department of Environmental Protection ¶ 17; Decl. of E. Scheehle, California Air Resources Board ¶¶ 9, 20.

things, drought and wildfire preparation and response, protection of public health, strengthening and repairing infrastructure impacted by extreme weather events, and additional actions necessary to meet federal air quality standards.[8] Weaker greenhouse gas emissions standards—which Petitioners seek by way of vacatur of the Final Rule—would result in increased emissions and greater harms to Movant-Intervenor States.

The Supreme Court and this Court have repeatedly found that these types of climate harms establish standing that supports state intervention. In *Massachusetts*, the Supreme Court decided that States—including many of the Movant-Intervenor States here—had standing to intervene to compel EPA to determine that these very emissions—greenhouse gas emissions from new motor vehicles—endanger public health and welfare. 549 U.S. at 522-23. There, the Court noted that "U.S. motor-vehicle emissions make a meaningful contribution to greenhouse gas concentrations and hence . . . to global warming," and "reducing domestic automobile emissions . . . would slow the pace of global emissions increases, no matter what happens elsewhere." *Id*. at 525. Similarly, this Court

[8] *See* Decl. of G. Auburn, Maryland Department of the Environment ¶ 16; Decl. of J. Chamberlin, California Department of Parks and Recreation ¶¶ 7-10; Decl. of L. Berry Engler, Massachusetts Executive Office of Energy and Environmental Affairs ¶¶ 16-25; Decl. of E. Fleishman, Oregon Climate Change Research Institute ¶¶ 7, 19-21; Decl. of M. Hammond, Pennsylvania Department of Environmental Protection ¶¶ 21-24; Decl. of E. Scheehle, California Air Resources Board ¶¶ 16-26.

permitted many of the Movant-Intervenor States here to intervene to defend EPA's Endangerment Finding, in which EPA found that "the combined emissions of [] greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas air pollution that endangers public health and welfare," and therefore must be regulated. 74 Fed. Reg. at 66,496; *see Coalition for Responsible Regulation, Inc. v. EPA*, 684 F.3d 102, 126 (D.C. Cir. 2012), *rev'd in part on unrelated issues* (*Util. Air Regul. Grp. v. EPA*, 573 U.S. 302 (2014)). Similarly, this Court granted leave to several of the Movant-Intervenor States here to intervene in support of EPA's first greenhouse gas emissions standards for passenger cars and light trucks, Doc. No. 1406411, *Plant Oil Powered Diesel Fuel Systems, Inc. v. EPA, et al.*, No. 12-1428 (D.C. Cir. Nov. 23, 2012), and in support of EPA's greenhouse gas emissions standards for heavy-duty trailers, Doc. No. 1665427, *Truck Trailer Mfrs. Ass'n, Inc. v. EPA*, No. 16-1430 (D.C. Cir. Mar. 10, 2017). The Court should likewise find that the States have standing and grant their intervention here.

The Final Rule's greenhouse gas emissions standards would also decrease emissions of criteria pollutants and toxic chemicals.[9] Movant-Intervenor States would be injured by emissions that would result if the Final Rule did not become effective, as relaxed greenhouse gas standards would increase emissions of criteria

[9] *See* 86 Fed. Reg. at 74,490-74,492; States Comments at 10-13.

pollutants and toxic chemicals. Such increases in criteria pollution would exacerbate adverse health impacts and make it more difficult for States to attain and maintain National Ambient Air Quality Standards established by EPA to protect public health.[10] Because States depend on early planning to reduce the costs of compliance, changes in federal regulatory approaches that significantly increase criteria emissions can be costly and disruptive to regulated industries in those States, as well as to the States themselves.[11]

Accordingly, Movant-Intervenor States satisfy the requirements for Article III standing.

B. Movant-Intervenor States Also Satisfy the Other Requirements for Intervention as of Right

As noted above, courts look to FRCP 24 when analyzing motions for leave to intervene in petitions for review. *Supra* at 7. FRCP 24(a) requires a court to grant intervention as of right to anyone who, on a timely motion, "claims an interest relating to the property or transaction that is the subject of the action, and is so situated that disposing of the action may as a practical matter impair or impede the movant's ability to protect its interest, unless existing parties adequately represent that interest." Under this Court's precedent, a prospective intervenor "need not

[10] *See* States Comments at 10-13; Decl. of S. Vanderspek, California Air Resources Board ¶¶ 18-22.

[11] *See* Decl. of S. Vanderspek, California Air Resources Board ¶¶ 8-15, 23.

show anything more than that it has standing to sue in order to demonstrate the existence of a legally protected interest for purposes of Rule 24(a)." *See Mova Pharmaceutical Corp. v. Shalala*, 140 F.3d 1060, 1076 (D.C. Cir. 1998).

As demonstrated above, Movant-Intervenor States have Article III standing. Even if more were required, intervention should still be granted, because the disposition of the Petitioners' petition could impair or impede Movant-Intervenor States' ability to protect their interests. *See Fund for Animals, Inc. v. Norton*, 322 F.3d 728, 733 (D.C. Cir. 2003) (determining that intervention in administrative review proceedings is appropriate where the movant would be harmed by a successful challenge to a regulatory action and that harm could be avoided by a ruling denying the relief sought by the petitioner).

This Court has made clear that a party need only "show[] that representation of [its] interest 'may be' inadequate; and the burden of making that showing should be treated as minimal." *Id.* at 735 (quoting *Trbovich v. United Mine Workers*, 404 U.S. 528, 538 n.10 (1972)). "[I]nterests need not be wholly adverse before there is a basis for concluding that existing representation of a different interest may be inadequate." *Nuesse v. Camp*, 385 F.2d 694, 703 (D.C. Cir. 1967) (quotation marks omitted). Courts have also recognized that federal and state entities may not share the same interests. *See Forest Conserv. Council v. U.S. Forest Serv.*, 66 F.3d 1489, 1499 (9th Cir. 1995) (finding the interests of the State of Arizona were not

necessarily represented by the U.S. Forest Service), *abrogated on other grounds by Wilderness Soc. v. U.S. Forest Serv.*, 630 F.3d 1173 (9th Cir. 2011).

Movant-Intervenor States have particular and substantial interests in limiting climate change pollution in order to prevent and mitigate loss and damage to publicly owned lands and natural resources, to protect public infrastructure and reduce damage-related costs, and to limit emergency response costs. *See Massachusetts*, 549 U.S. at 521-23. The history of EPA's greenhouse gas emissions standards demonstrates that these interests have not always aligned with those of Respondents. EPA promulgated standards in 2012, found that those standards remained appropriate in 2017, reversed its finding of appropriateness in 2018, significantly weakened its standards in 2020, and increased the stringency of its standards in 2021. While Movant-Intervenor States currently share EPA's broad aim of opposing the petitions seeking to vacate the Final Rule, EPA's recent shifts in positions underscores that the specific interests of EPA and Movant-Intervenor States may diverge as the litigation progresses. More generally, given our States and Cities' distinct interests, Movant-Intervenor States may choose to advance different arguments or make different strategic choices than EPA in this litigation. For example, EPA may seek to settle or otherwise resolve this case in ways that could be adverse to Movant-Intervenor States' interests. Movant-

Intervenor States seek to intervene here in order to adequately protect the important and substantial interests described above.

Finally, this motion is timely, because it was filed within 30 days after the petitions for review were filed. *See* Fed. Rule of App. Proc. 15(d).

Accordingly, Movant-Intervenor States satisfy the requirements for intervention of right.

II. ALTERNATIVELY, MOVANT-INTERVENOR STATES SHOULD BE GRANTED PERMISSIVE INTERVENTION

Movant-Intervenor States also satisfy the less burdensome requirements for permissive intervention. FRCP 24(b) allows a court to grant intervention to anyone who, on timely motion, "has a claim or defense that shares with the main action a common question of law or fact" so long as the intervention would not "unduly delay or prejudice the rights of the original parties." This Court has "eschewed strict readings of the phrase 'claim or defense,'" and its body of precedents instead "compels a flexible reading of Rule 24(b)." *EEOC*, 146 F.3d at 1046.

As demonstrated above, Movant-Intervenor States have compelling interests in preventing any weakening of the standards for model years 2023 through 2026 as well as preserving the ability of EPA to adopt robust standards in the future. In recognition of similar interests, this Court has previously permitted Movant-Intervenor States to participate in related litigation. *See supra* at 11-12. This

motion is timely and granting it will not cause undue delay or prejudice the rights of any parties. Petitioners filed their petitions for review on February 28, 2022, their initial submissions are not due until April 1, 2022, and Respondents have until April 18, 2022 to file the certified index. Moreover, the Court has not yet set a briefing schedule. Thus, Movant-Intervenor States meet the requirements for permissive intervention.

CONCLUSION

For the reasons stated herein, Movant-Intervenor States respectfully request that the Court grant their motion to intervene in case number 22-1031 and consolidated cases.

Dated: March 8, 2022

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CERTIFICATE OF COMPLIANCE

I hereby certify that the foregoing motion complies with the type-volume limitations of Federal Rule of Appellate Procedure 27(d)(2) because it contains 3,509 words. I further certify that this motion complies with the typeface requirements of Federal Rules of Appellate Procedure 27(d)(1)(E), 32(a)(5), and 32(a)(6) because it has been prepared using a proportionally spaced typeface (Times New Roman) in 14-point font.

Dated: March 8, 2022

/s/ Micaela M. Harms
Micaela M. Harms
Attorney for State of California by and through its Governor Gavin Newsom, its Attorney General Rob Bonta, and the California Air Resources Board

CERTIFICATE OF PARTIES ADDENDUM

Pursuant to Circuit Rule 27(a)(4) and 28(a)(1)(A), I certify that the parties—including proposed intervenors and amici curiae—are set forth below.

Petitioners: The States of Texas, Alabama, Alaska, Arkansas, Indiana, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Ohio, Oklahoma, South Carolina, and Utah (Case No. 22-1031); Competitive Enterprise Institute, Anthony Kreucher, Walter M. Kreucher, James Leedy, Marc Scribner, and the Domestic Energy Producers Alliance (Case No. 22-1032); the State Soybean Associations of the States of Illinois, Iowa, Indiana, Michigan, Minnesota, North Dakota, Ohio, and South Dakota, and Diamond Alternative Energy, LLC (Case No. 22-1033); American Fuel and Petrochemical Manufacturers (Case No. 22-1034); the State of Arizona (Case No. 22-1035); Clean Fuels Development Coalition, ICM, Inc., Illinois Corn Growers Association, Indiana Corn Growers Association, Kansas Corn Growers Association, Kentucky Corn Growers Association, Michigan Corn Growers Association, Missouri Corn Growers Association, and Valero Renewable Fuels Company, LLC (Case No. 22-1036); and Energy Marketers of America (Case No. 22-1038).

Respondents: United States Environmental Protection Agency and Michael S. Regan, Administrator, United States Environmental Protection Agency.

Proposed Intervenors: Conservation Law Foundation, Environmental Defense Fund, Environmental Law and Policy Center, Natural Resources Defense Council, Public Citizen, Sierra Club, and Union of Concerned Scientists.

Amici Curiae: There are no amici curiae at the time of this filing.

Dated: March 8, 2022

/s/ Micaela M. Harms
Micaela M. Harms
Attorney for State of California by and through its Governor Gavin Newsom, its Attorney General Rob Bonta, and the California Air Resources Board

CERTIFICATE OF SERVICE

I hereby certify that on March 8, 2022 I electronically filed the foregoing motion with the Clerk of the Court for the United States Court of Appeals for the District of Columbia Circuit using the Court's CM/ECF system.

I further certify that all parties are participating in the Court's CM/ECF system and will be served electronically by that system.

Dated: March 8, 2022

/s/ Micaela M. Harms
Micaela M. Harms
Attorney for State of California by and through its Governor Gavin Newsom, its Attorney General Rob Bonta, and the California Air Resources Board

DECLARATION OF SYLVIA VANDERSPEK

I, Sylvia Vanderspek, declare as follows:

Relevant expertise

1. I make this declaration based upon my knowledge and expertise in the matters within, my review of the relevant rulemakings, reports, and other documents discussed below, and (where indicated) information provided by my colleagues at the California Air Resources Board (CARB). I submit this declaration in support of Movant-Intervenor State of California's Motion to Intervene in this challenge.

2. I am the Chief of the Air Quality Planning Branch in the Air Quality Planning & Science Division at CARB. I have held this position since May 2013.

3. I am the lead manager responsible for the Clean Air Act state implementation planning and control strategy development throughout the State for meeting air quality standards. The State Implementation Plan is required by the Clean Air Act for areas that do not meet air quality standards and describes how those air quality standards will be met by their attainment deadline. As part of the control strategy development, I oversaw the development of the 2016 Mobile Source Strategy[1] and 2020 Mobile Source Strategy[2] integrating the technologies for and approaches to criteria emission reductions with climate and toxic emission reductions

[1] Mobile Source Strategy (May 2016), https://ww3.arb.ca.gov/planning/sip/2016sip/2016mobsrc.pdf.
[2] Mobile Source Strategy (Oct. 2021), 2020 Mobile Source Strategy (ca.gov).

in the mobile source sector. The Mobile Source Strategies build upon past and inform future State Implementation Plans as well as California's Climate Change Scoping Plan and Community Emission Reduction Plans.

4. In fulfilling my responsibilities as the lead manager for Clean Air Act state implementation planning throughout the State, I routinely review relevant plans and reports, and in doing so rely on my knowledge of: atmospheric modeling of air pollution, atmospheric reactions that contribute to air pollution, air pollution trends and projections, other causes of air pollution, and the health effects of air pollution. My knowledge of atmospheric modeling, including the atmospheric reactions that contribute to air pollution, is critical to my management of State Implementation Plan planning in order to identify the most effective strategies for providing healthy air for the residents of California. I also use my knowledge of air pollution trends and emissions, along with future emission projections, when overseeing the selection of future strategies and their impact on air quality. And as part of the State Implementation Plan planning process, I must analyze the health effects of criteria pollutants and other air pollutants.

5. Prior to this, I was the manager of the Particulate Matter Analysis Section in the Planning and Technical Support Division at CARB from February 2006 until May 2013. In that role, I supervised the development of particulate matter State Implementation Plans statewide and ozone State Implementation Plans for the San Joaquin Valley air basin. In addition, I oversaw development of the technical support

analyses required to address particulate matter pollution and meet air quality standards in California.

6. Prior to that, I was a staff member of the Transportation Strategies Section in the Planning and Technical Support Division from April 2001 until February 2006 working on particulate matter and ozone implementation plans.

7. I have a Bachelor of Science in Agricultural Engineering from California Polytechnic State University, San Luis Obispo.

Clean Air Act planning obligations

8. The federal Clean Air Act (Act) requires EPA to set National Ambient Air Quality Standards (NAAQS) for six "criteria" pollutants. The Act also requires states to develop and enforce implementation plans for "nonattainment" areas, i.e., areas of the State that do not meet the NAAQS or contribute to a nearby area that does not meet the NAAQS. Nonattainment areas have air pollution surpassing levels the federal government has deemed requisite to protect public health and the environment.

9. The NAAQS for two of these criteria pollutants—ozone and fine particulate matter ($PM_{2.5}$)—are particularly relevant in California. California suffers some of the worst air pollution in the nation. The South Coast and San Joaquin Valley air basins are the only two regions in the country classified as 'Extreme'—the worst category—for nonattainment of the federal ozone standard of 75 parts per billion (ppb). These areas also suffer some of the worst levels of $PM_{2.5}$ pollution.

10. For all of the State's nonattainment areas, California must implement all reasonably available pollution control measures as expeditiously as practicable. California's ozone and $PM_{2.5}$ nonattainment areas rely on immediate emission reductions to provide critical health benefits and to demonstrate attainment of the standards in those areas with near-term attainment dates. California also has an interest in reducing harmful pollution across the State—including in areas that have attained the federal NAAQS—both because California must at least maintain attained air quality and because reducing this harmful pollution protects human health and the environment.

11. For the South Coast and San Joaquin Valley air basins, there are impending deadlines to attain various NAAQS: 2022 for 1-hour ozone, 2023 for 80 ppb ozone, 2024 for 24-hour $PM_{2.5}$, 2025 for annual $PM_{2.5}$, and 2031 for 75 ppb ozone, as well as later years. Attaining these NAAQS, especially for ozone, requires sustained, comprehensive action to reduce emissions from all categories of sources. For instance, to achieve the ozone standards by 2031, CARB must reduce smog-forming NOx emissions from on-road light-and heavy-duty vehicles by 85% from 2015 levels.[3]

[3] *See, e.g.*, CARB, Revised Proposed 2016 State Strategy for the State Implementation Plan at 8, 11 (Mar. 7, 2017), https://ww3.arb.ca.gov/planning/sip/2016sip/rev2016statesip.pdf.

12. Other areas of California also do not meet the NAAQS. For example, the Sacramento ozone nonattainment area is required to attain the 75 ppb 8-hour ozone standard by 2024.

13. If an area attains an air quality standard and is redesignated as attainment, it must develop a maintenance plan with measures and controls ensuring its air quality levels continue to remain below the standard.

14. If an area does not attain an air quality standard by the applicable deadline under the Clean Air Act, the consequences are substantial. In addition to the public health and environmental consequences, failure to meet a standard in the time required imposes additional obligations on the State to develop and submit a new plan that could lead to increased costs and restrictions on the myriad activities that cause air pollution.

15. California also has its own Clean Air Act, under which CARB has established state ambient air quality standards. These standards are generally more stringent than their federal counterparts, and CARB and the local air districts are mandated to meet and maintain those standards as well.[4]

EPA's revised standards lower criteria pollutant and greenhouse gas emissions.

[4] *E.g.*, Cal. Health & Safety Code §§ 39606, 40910–40930.

16. In 2021, EPA proposed to strengthen its light-duty vehicle greenhouse gas emission standards for model years 2023 through 2026.[5] This revision would course-correct EPA's standards set by the so-called "SAFE" Final Rule (which was a significant weakening of previously existing standards).[6] CARB submitted comments on the proposal, advocating for the most stringent standards feasible and that the most stringent standards proposed are achievable with current technologies.[7] EPA finalized those standards on December 30, 2021, promulgating the standards as proposed under its preferred alternative for model years 2023 and 2024 and those under its more stringent alternative for model years 2025 and 2026 (including the additional drop of 10 grams per mile for model year 2026).[8] These revised standards are anticipated to reduce emissions of fine particulate matter ($PM_{2.5}$) by 14,701 tons, nitrogen oxide by 60,216 tons, and greenhouse gases by 3.1 billion tons by 2050.[9]

17. EPA's revised standards have now been challenged. Should these standards not go into effect, the SAFE standards would remain, and California would still expect to see criteria pollutant emissions increases from increased oil refining. Additionally, increased greenhouse gas emissions would also aggravate criteria

[5] 86 Fed. Reg. 43,726 (Aug. 10, 2021).
[6] 85 Fed. Reg. 24,174 (Apr. 30, 2020).
[7] Analysis in Support of Comments of the California Air Resources Board on Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emission Standards (Sept. 27, 2021), Docket No. EPA-HQ-OAR-2021-0208-0643.
[8] 86 Fed. Reg. 74,434, 74,348 (Dec. 30, 2021).
[9] *Id.* at 74,444, 74,491-92 Table 35.

pollution. Such emission increases harm California in a number of ways, as described below.

The SAFE standards increase criteria pollutant and greenhouse gas emissions, thus jeopardizing several of California's attainment plans for both federal and State ambient air quality standards and necessitating additional emission reductions.

18. EPA's SAFE Final Rule results in higher criteria pollutant and greenhouse gas emissions and increases concentrations of ground-level ozone and particulate matter.

19. In its analysis of the SAFE Final Rule, EPA projects that the SAFE standards increase gasoline consumption by 78 billion gallons, increase criteria pollutant emissions, and cause up to 1,000 premature deaths and other health problems due to worsened air quality.[10] According to analysis done by my colleagues at CARB, these projections—and their resulting health impacts—are likely underestimated because of several errors in the analysis.

20. The increase in criteria pollutants resulting from EPA's SAFE standards will primarily occur "upstream," i.e., from sources responsible for the refinement, production, storage, and transport of gasoline. California has more oil refineries than all other states except for Texas and Louisiana, and several are located in the South Coast and San Joaquin Valley air basins. Indeed, California's refineries have the capacity to refine almost two million barrels per day, or about 10 percent of the

[10] 85 Fed. Reg. at 24,181, 25,060, and 25,084.

nation's total refining capacity, and are not currently refining at capacity.[11] Increased oil consumption and refining from the SAFE standards would adversely affect California, particularly in its areas that already struggle the most with criteria pollution. The increased emission of criteria pollutants resulting from the SAFE Final Rule will make it more difficult for California to meet and maintain the NAAQS for ozone and particulate matter.

21. In addition, EPA found that its new standards will increase greenhouse gas emissions by up to 923 million metric tons, which will increase the harmful effects of climate change.[12] Several of these climate impacts are making it more difficult for California to attain and maintain State and federal ambient air standards for ozone and particulate matter. For example, the concentrations of both pollutants depend strongly on temperature. Studies indicate that increasing temperatures generally cause increases in ozone concentrations in California's polluted regions due to accelerated

[11] CEC, *California's Oil Refineries*, California's Oil Refineries; Erwin Seba, *U.S. refining capacity shrinks 4.5% as pandemic shuts plants*, Reuters (June 25, 2021), U.S. refining capacity shrinks 4.5% as pandemic shuts plants | Reuters ("U.S. refining capacity last year fell 4.5% to 18.13 million barrels per day . . . ."); *see also* EIA, *Petroleum & Other Liquids: Weekly Refiner & Blender Net Production*, PADD 5 Weekly Refiner & Blender Net Production (eia.gov) (Dec. 22, 2021); EIA, *Petroleum & Other Liquids: Number and Capacity of Petroleum Refineries*, PAD District 5 Number and Capacity of Petroleum Refineries (eia.gov), California Number and Capacity of Petroleum Refineries (eia.gov) (June 25, 2021); EIA, Refinery Utilization and Capacity, PAD District 5 Refinery Utilization and Capacity (eia.gov) (Nov. 30, 2021).

[12] 85 Fed. Reg. at 24,181.

chemical reaction rates.[13] Additional emission controls will need to be implemented to make up for the "climate penalty" that causes higher air pollutant concentrations.[14,15,16]

22. The increased frequency of wildfires and droughts due to climate change will also impede progress toward attainment and maintenance. Decades of air pollution gains within the western United States are being erased by the increasing number and severity of wildfires.[17] Smoke from wildfires contains $PM_{2.5}$, which is the most damaging size of particulate matter for human health. For instance, from August through October 2020, massive wildfires up and down the State blanketed large portions of California with smoke for weeks, turning the skies orange and producing some of the worst air quality in the world. These fires caused significant increases in $PM_{2.5}$ throughout the State and contributed to an increase in the number of high ozone "bad air" days in the South Coast Air Basin to levels not seen in over two

[13] For instance, the American Lung Association's *State of the Air: 2018* report found that California's ozone levels rose significantly in 2016 due to extreme temperatures (page 4), and its *State of the Air: 2021* report also notes the continuing role warming temperatures play on air quality (pages 13 & 14, State of the Air 2021 (lung.org)).
[14] D.J. Jacob & D.A. Winner, *Effect of Climate Change on Air Quality*, ATMOS. ENVIRON. 43, 51–63 (2009).
[15] S. Wu, et al., *Effects of 2000–2050 Global Change on Ozone Air Quality in the United States*, J. GEOPHYS. RES.-ATMOS., 113 (2008).
[16] A.M. Fiore, et al., *Air Quality and Climate Connections*, J. AIR WASTE MANAGE. ASSOC. 65 (6), 645–685 (2015).
[17] Proc. Nat'l Acad. Sci. (Jul. 16, 2018), https://www.ncbi.nlm.nih.gov/pubmed/30012611.

decades.[18] Similarly, climate change is increasing the frequency of droughts, which will increase wind erosion and ambient dust concentration.[19] As soils become increasingly dry during a drought, dust from the ground is more likely to become airborne. Particulate matter suspended in the air from these events or from wildfire smoke can increase the risk for respiratory infections like bronchitis and pneumonia, which will result in greater health costs to the State.[20,21]

23. Should EPA's revised standards not go into effect, the increased criteria emissions from the SAFE Final Rule would need to be mitigated by developing additional control measures. But California's implementation plans already include all reasonably available control measures and other measures necessary to attain the federal standards by the Clean Air Act's deadlines. Section 182(e)(5) of the federal Clean Air Act allows Extreme ozone nonattainment areas to anticipate development of new control techniques or improvement of existing control technologies and rely on those to demonstrate attainment in the implementation plan. CARB has worked

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[18] The Fresno Bee, "California's air quality is the worst in the nation. How to protect yourself" (Sept. 8, 2020), https://www.fresnobee.com/news/california/fires/article245574900.html; Los Angeles Times, "L.A. began 2020 with a clean-air streak, but ended with its worse smog in decades" (Dec. 6, 2020), https://www.latimes.com/california/story/2020-12-06/2020-la-air-quality-southern-california-pollution-analysis.

[19] M.C. Duniway, et al., *Wind Erosion and Dust from US Drylands: A Review of Causes, Consequences, and Solutions in a Changing World*, ECOSPHERE 10(3) (2019).

[20] C. Stanke, et al., *Health Effects of Drought: A Systematic Review of the Evidence*, PLOS CURRENTS, 5 (2013).

[21] *See, e.g.*, C.G. Jones, et al., *Out-of-Hospital Cardiac Arrests and Wildfire-Related Particulate Matter During 2015-2017 California Wildfires*, J. AM. HEART ASSOC. 9(8) (2020).

with the South Coast air district to include these new or improved technologies expectations into the existing implementation plan.[22] Developing additional control measures to grapple with the additional criteria pollutant emissions from the SAFE Final Rule would be onerous in all nonattainment areas, but will be particularly hard in the South Coast and San Joaquin Valley air basins.

I certify under penalty of perjury under the laws of the State of California and the United States of America that the foregoing is true and correct.

Executed on December 30, 2021, at Sacramento, County of Sacramento, California.

Sylvia Vanderspek

SYLVIA VANDERSPEK

[22] *See* 84 Fed. Reg. 28,132, 28,135-36 (June 17, 2019) for U.S. EPA's proposed approval of California's comprehensive plan for the South Coast air basin to meet multiple ozone NAAQS that relies on new technologies under Section 182(e)(5) of the Clean Air Act, and additional commitments from the District to reduce emissions.

DECLARATION OF ELIZABETH SCHEEHLE

I, Elizabeth Scheehle, state and declare as follows:

Experience

1. I am currently the Chief of the Research Division of the California Air Resources Board (CARB). I have a B.S. in Earth and Atmospheric Sciences from the Georgia Institute of Technology, a Masters of Public Policy from the Kennedy School of Government at Harvard University, and a Masters of Public Health from the Bloomberg School of Public Health at Johns Hopkins University.

2. I have worked for more than 20 years in climate change and air quality programs, starting at the U.S. Environmental Protection Agency (U.S. EPA) where I led national and international efforts on non-carbon dioxide greenhouse gases (GHGs). I served as an expert for the United Nations Framework Convention on Climate Change and the Intergovernmental Panel on Climate Change (IPCC). In that role, I earned recognition for my contribution to the IPCC's Nobel Prize. I continued my career at U.S. EPA, developing its Carbon Capture and Sequestration expertise, including comprehensive risk assessment considerations.

3. I joined CARB's Research Division in 2007 and led three climate change-related efforts: carbon capture and sequestration, an ozone-depleting substance offset protocol, and an early action climate measure. I was a Section Manager of the Research Division's GHG Technology and Field-Testing Section

before next joining the Cap-and-Trade Program in CARB's Industrial Strategies Division. In 2014, I became a Branch Chief in the Industrial Strategies Division, overseeing programs related to oil and gas operations, alternative fuel regulations, and carbon capture and sequestration.

4. In 2018, I began my current role of Chief of the Research Division. In that capacity, I oversee CARB's research program, which investigates the causes of human health and welfare impacts from air pollutant emissions and the potential for reducing those impacts through emission reduction strategies. I also lead the development and implementation of multidisciplinary research plans and studies to provide a robust scientific foundation for our air quality and climate policy decisions. In addition, the Division implements programs on indoor air quality and high global-warming potential gas mitigation. I have broad experience with climate science and research.

5. I make this declaration based upon my knowledge and expertise in the matters within and upon my review of relevant rulemakings, reports, and other documents discussed below. I submit this declaration in support of the Movant-Intervenor State of California's Motion to Intervene.

Climate Change

6. Climate change is driven by the accumulation of greenhouse gases in the atmosphere. Greenhouse gases retain heat that would otherwise escape back to

space. Increasing concentrations of greenhouse gases in the atmosphere thus cause a continuing increase of the planet's average temperature over time, which in turn disrupts established geophysical systems (such as ocean circulation) and ecosystems across the globe. Since the Industrial Revolution, the predominant source of climate change-causing greenhouse gas emissions has been human activities. Human activities cause the emission of greenhouse gases in various ways, including deforestation and the combustion of fossil fuels for energy.

7. Of all the long-lived greenhouse gases, the ones that have the largest climate impact are carbon dioxide (CO_2), methane, and nitrous oxide. Of those three, CO_2 is the most important because, even though it absorbs less heat per molecule than methane or nitrous oxide, it is more abundant and stays in the atmosphere much longer. Before the Industrial Revolution started in the mid-1700s, the global average amount of CO_2 was about 280 parts per million. The most recent data from the National Oceanic and Atmospheric Association (NOAA) shows average global CO_2 concentrations, measured at Mauna Loa Observatory, peaked for 2021 in May at a monthly average of 419 parts per million (ppm), the highest level since accurate measurements began 63 years ago in Hawaii in 1958.[1] In August 2021,

[1] NOAA Global Monitoring Laboratory, https://research.noaa.gov/article/ArtMID/587/ArticleID/2764/Coronavirus-response-barely-slows-rising-carbon-dioxide https://www.esrl.noaa.gov/gmd/ccgg/trends/.

the IPCC Working Group 1 released part of the 6th Assessment Report (AR6) titled "Climate Change 2021: The Physical Basis"[2], which reaffirmed with high confidence that there is a near-linear relationship between cumulative anthropogenic CO_2 emissions and the global warming they cause. This temperature response to increasing carbon dioxide levels in the atmosphere is a critical metric that provides foresight into the potential adverse impacts of climate change.

8. Because of this dramatic uptick in CO_2 concentrations, the average global surface temperature has increased by around 1.1 degrees Celsius compared with the average in 1850–1900—a level that hasn't been witnessed since 125,000 years ago, before the most recent ice age.[3] According to independent analyses by the National Aeronautics and Space Administration (NASA) and NOAA, Earth's average global surface temperatures in 2019 were the second warmest (following 2016) since measurements began in 1880, and the past five years have been the warmest of the

[2] IPCC AR6 Climate Change 2021: The Physical Science Basis. Sixth Assessment Report (ipcc.ch)

[3] IPCC AR6 2021, *Summary for Policymakers*, *https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf* (IPCC uses the reference period 1850–1900 to approximate pre-industrial temperature, as this is the earliest period with near-global observations.).

last 140 years.[4] Earth's global average surface temperature in 2020 tied with 2016 as the warmest year on record, according to an analysis by NASA.[5]

9. The warming climate is also driving up ocean surface temperatures. The ocean has absorbed about 29 percent of global CO_2 emissions since the end of the pre-industrial era. Adding additional CO_2 to the ocean is changing the ocean's chemistry, making it more acidic and slowing its ability to take up more CO_2. If the ocean starts to take up less CO_2, more is left in the atmosphere where it can contribute to additional warming. Furthermore, warming global and regional temperatures are contributing to rising sea levels, from both thermal expansion of the ocean itself and melting sea ice and glaciers around the world. The IPCC 2021 Summary for Policymakers (SPM)[6] provides a high-level summary of the understanding of the current state of the climate. The SPM report states it is very likely to virtually certain that regional mean relative sea level rise will continue throughout the 21st century. Extreme sea level events that occurred once per century in the recent past are projected to occur at least annually, which will lead to loss of land, resources, infrastructure, and life. Several recent studies further demonstrated

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[4] James Hanson, et al., Global Temperature in 2019 (Jan. 15, 2020), ttp://www.columbia.edu/~jeh1/mailings/2020/20200115_Temperature2019.pdf.

[5] https://www.nasa.gov/press-release/2020-tied-for-warmest-year-on-record-nasa-analysis-shows

[6] https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf

the extraordinary nature of these impacts by finding that prior studies had underestimated the impacts of sea-level rise, storms, and flooding in California;[7] demonstrating that local CO_2 concentrations above Monterey Bay fluctuate by time of day likely because of the surrounding environment and topography, likely increasing the expected rate of acidification of the Bay;[8] and showing the waters of the California current ecosystem have already acidified by over twice the global average.[9]

10. The timing of greenhouse gas emissions is also important because greenhouse gases can remain in the atmosphere for long periods of time. Their warming effect is compounded by future emissions, thereby accelerating climate impacts. Carbon dioxide in particular remains in the atmosphere longer than the other major greenhouse gases emitted as a result of human activities. Carbon dioxide's lifetime is difficult to represent with a single value because it moves at

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[7] Patrick L. Barnard, et al., "Dynamic Flood Modeling Essential to Assess the Coastal Impacts of Climate Change," 9 SCIENTIFIC REPORTS 4309 (Mar. 13, 2019) (submitted to the docket in NGO Letter, Apr. 5, 2019 (Docket #EPA-HQ-OAR-2018-0283-7452)).

[8] Northcott D., Sevadjian J., Sancho-Gallegos D.A., Wahl C., Friederich J., Chavez F.P. (2019) Impacts of urban carbon dioxide emissions on sea-air flux and ocean acidification in nearshore waters. PLoS ONE 14(3): e0214403. https://doi.org/10.1371/journal.pone.0214403 (submitted to the record in CARB Letter, May 31, 2019 (NHTSA-2018-0067-12411)).

[9] Osborne, E.B., Thunell, R.C., Gruber, N. *et al.* Decadal variability in twentieth-century ocean acidification in the California Current Ecosystem. *Nat. Geosci.* (2019) doi:10.1038/s41561-019-0499-z.

varying rates among different parts of the ocean–atmosphere–land system. Some of the excess carbon dioxide is absorbed quickly (for example, by the ocean surface), but some will remain in the atmosphere for thousands of years, due in part to the very slow process by which carbon is transferred to ocean sediments. As explained in the Fourth National Climate Assessment, "[w]aiting to begin reducing emissions is likely to increase the damages from climate-related extreme events (such as heat waves, droughts, wildfires, flash floods, and stronger storm surges due to higher sea levels and more powerful hurricanes)."[10]

11. The timing of greenhouse gas emissions also affects the likelihood of reaching climate tipping points. Tipping points are thresholds of abrupt and irreversible change (such as creating an irreversible shift to a hotter world with higher sea levels, changes in ocean circulation, or near-permanent drought in some regions). Two IPCC Special Reports (published in 2018 and 2019)[11,12] suggest that tipping points could be exceeded by warming of even between 1 and 2 degrees Celsius. The IPCC 2021 AR6 places new emphasis on climate tipping points. The report defines a tipping point as an "abrupt change" — a threshold that, once crossed, can cause elements of the Earth system to change into an entirely different state. These tipping

[10] Global Change Research Program, Impacts, Risks, and Adaptation in the United States: National Climate Assessment, Volume I, at 1488 (2018).
[11] IPCC, *Global Warming of 1.5°C* (2018), https://www.ipcc.ch/sr15/.
[12] IPCC, *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* (2019), https://www.ipcc.ch/2019/09/25/srocc-press-release/.

points have varying degrees of probability, but are high-risk in that they could lead to dramatic changes in the climate system. A recent commentary in the journal Nature warned that the acceleration of ice loss and other effects of climate change have brought the world "dangerously close" to tipping points.[13] As global temperature increases, threshold environmental events are increasingly likely to occur that will themselves significantly accelerate climate change beyond current projections.

Light-duty Vehicles' Contributions to Greenhouse Gas Emissions

12. As part of its efforts to reduce harmful air pollution, CARB has regulated emissions from light-duty vehicles since 1959. Light-duty vehicles are responsible for 70 percent of the State's transportation GHG emissions. Light-duty vehicles remain the largest source of emissions within the transportation sector, with car ownership rates continuing to outpace population growth. In 2004, California enacted the Nation's first law requiring limits on vehicular greenhouse gas emissions, Cal. Health & Safety Code § 43018.5, and CARB subsequently adopted regulations establishing such limits, 13 Cal. Code Regs. §§ 1961.1, 1961.3. EPA later adopted similar greenhouse gas emission standards, and California adopted amendments to its regulations that deemed compliance with the federal standards beginning with the 2012 model year as demonstrating compliance with the California standards.

[13] Timothy M. Lenton, et al., *Comment: Climate Tipping Points - Too Risky to Bet Against*, NATURE (Apr. 9, 2020) https://www.nature.com/articles/d41586-019-03595-0.

13. In 2018, EPA reversed course and proposed to significantly weaken its standards for model years 2021 through 2025 and to continue the weakened trend to model year 2026. EPA finalized its weakened standards in 2020 (the so-called "SAFE" Final Rule).[14] According to EPA, its SAFE standards would have increased greenhouse gas emissions by up to 923 million metric tons.[15] CARB then clarified its regulations that compliance with federal standards significantly weaker than California's standards would not be deemed compliance with California's standards,[16] and also challenged EPA's revised standards as arbitrary, capricious, and unlawful. That litigation was stayed upon the Biden Administration's direction to EPA to reconsider its SAFE standards.

14. In 2021, EPA proposed to strengthen its light-duty vehicle greenhouse gas emission standards for model years 2023 through 2026 to levels similar, in terms of emissions benefits, to those in place prior to the SAFE Final Rule.[17] CARB submitted comments on the proposal, advocating for the most stringent standards feasible and that the most stringent standards proposed are achievable with current technologies.[18] EPA finalized those standards on December 30, 2021, promulgating

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[14] 85 Fed. Reg. 24,174 (Apr. 30, 2020); *see also* 83 Fed. Reg. 42,986 (Aug. 24, 2018).
[15] 85 Fed. Reg. at 24,180-81.
[16] *See* Resolution 18-35 (Sept. 28, 2018), CARB Document: https://www.arb.ca.gov/regact/2018/leviii2018/finalres18-35.pdf.
[17] 86 Fed. Reg. 43,726 (Aug. 10, 2021).
[18] Analysis in Support of Comments of the California Air Resources Board on Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emission Standards (Sept. 27, 2021), Docket No. EPA-HQ-OAR-2021-0208-0643.

the standards as proposed under its preferred alternative for model years 2023 and 2024 and those under its more stringent alternative for model years 2025 and 2026 (including the additional drop of 10 grams per mile for model year 2026).[19] These revised standards are anticipated to reduce greenhouse gas emissions by 3.1 billion tons.[20]

15. EPA's revised standards have now been challenged. Should these standards not go into effect, the SAFE standards and their admitted significant greenhouse gas emission increases would remain. Such greenhouse gas emission increases harm California in a number of ways, as described below.

Climate Change Impacts on California

16. California is one of the most geographically and ecologically diverse regions in the world, with landscapes ranging from chaparral and grasslands to sandy beaches and rugged coastal areas to redwood rainforests and dense interior forests to snow-covered alpine mountains to dry desert valleys. Each of these regions experiences a unique combination of impacts from climate change. From record temperatures to increasingly intense wildfires[21] to rising sea levels and increasingly

[19] 86 Fed. Reg. 74,434, 74,348 (Dec. 30, 2021).
[20] *Id.* at 74,444.
[21] N.S. Diffenbaugh, A.G. Konings, C.B. Field, (2021). Atmospheric variability contributes to increasing wildfire weather but not as much as global warming. Proceedings of the National Academy of Sciences Nov 2021, 118 (46) e2117876118; DOI: 10.1073/pnas.2117876118.
https://www.pnas.org/content/118/46/e2117876118

acidic seas[22] to less reliable snowpack,[23] climate change poses an immediate and escalating threat to California's environment, public health, and economic vitality.

17. California is already experiencing the effects of climate change, and it is expected that these effects will worsen in the coming decades, particularly if actions are not taken to mitigate greenhouse gas emissions. For instance, consistent with global and US observations, California temperatures have risen since records began in 1895, with the rate of increase accelerating since the 1980s.[24] Data released in fall of 2020 by NOAA's National Centers for Environmental Information[25] shows that September 2020 officially ranks as California's hottest September since record-keeping began in 1880. Tracking with rising temperatures, California's 2020 fire season has been record-breaking, not only in the total amount of acres burned (at just over 4 million) but also in wildfire size: 6 of the 20 largest wildfires in California history occurred in 2020. In 2021, the period from June through August was the

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[22] E.B. Osborne, et al., *Decadal Variability in Twentieth-century Ocean Acidification in the California Current Ecosystem*, 13 NAT. GEOSCI. 43–49 (2020), https://doi.org/10.1038/s41561-019-0499-z.

[23] P.W. Mote, et al., *Dramatic Declines in Snowpack in the Western US*, 1 NATURE PARTNER JS. CLIM. ATMOS. SCI. (2018), https://doi.org/10.1038/s41612-018-0012-1.

[24] Office of Environmental Health Hazard Assessment, California Environmental Protection Agency (2018). Indicators of Climate Change in California. https://oehha.ca.gov/media/downloads/climate-change/report/2018caindicatorsreportmay2018.pdf.

[25] NOAA, Earth just had its hottest September on record (Oct. 14, 2020), https://www.noaa.gov/news/earth-just-had-its-hottest-september-on-record.

hottest on record in the United States, exceeding even the Dust Bowl summer of 1936, and five states—California, Idaho, Nevada, Oregon and Utah—recorded their warmest summers on record.[26] Warmer air temperatures alter precipitation and runoff patterns, affecting the availability of freshwater supplies. Temperature changes can also increase the risk of severe weather events, such as heat waves and intense storms. A wide range of impacts on ecosystems and on human health and well-being are associated with increased temperatures.[27]

18. The increasing temperatures and occurrence of extreme heat events are requiring local governments to expand provision of cooling centers. Each cooling center costs around $2,000 per day to operate.[28] The State's 2021-2022 spending plan also includes, for the first time, a 3-year climate resiliency package totaling $3.7 billion, with $800 million specifically allocated for extreme heat-related efforts

[26] https://www.noaa.gov/news/summer-2021-neck-and-neck-with-dust-bowl-summer-for-hottest-on-record

[27] Office of Environmental Health Hazard Assessment, *Indicators of Climate Change*, oehha.ca.gov/climate-change/document/indicators-climate-change-california.

[28] *E.g.*, Chris Nichols, *Despite The Heat, Few Take Advantage Of Sacramento Cooling Centers*, CAPRADIO (June 18, 2021), Despite The Heat, Few Take Advantage Of Sacramento Cooling Centers - capradio.org; Emily Alpert Reyes, *L.A. suffered deadly heat, yet chairs sat empty at its cooling centers*, L.A. TIMES (Sept. 19, 2020), Few used L.A. cooling centers during record heat wave - Los Angeles Times (latimes.com); *see also* Lance Howland, *In High-Temperature Areas, What are Cities and Counties Doing For Residents?*, PUBLICCEO (July 14, 2009), In High-Temperature Areas, What are Cities and Counties Doing For Residents? – PublicCEO.

(including mitigation, urban greening, and community resilience centers).[29] Having to expand these services and efforts in response to the changing climate comes at the expense of other actions for the public benefit.

19. California's infrastructure is at increasing risk from climate change. California owns and operates a wide range of physical assets and infrastructure, including the state highway system, university campuses, parks, and historic structures. These assets are worth billions of dollars, and the State uses this infrastructure to provide critical services to its residents. Climate change impacts, including sea-level rise, more severe heat days, more frequent drought, and increased risk of wildfires, heighten the risk of the State's infrastructure being damaged or lost, disruption to the State providing key services, and impairment of natural habitats within the State.[30]

20. In particular, melting ice from Antarctica is causing higher sea-level rise in California than the global average. California has the nation's largest ocean economy, valued at over $44 billion per year, with the vast majority of it connected to coastal recreation and tourism as well as ports and shipping. Many of the facilities and infrastructure that support California's ocean economy—not to mention the

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[29] Legislative Analyst's Office, *The 2021-22 California Spending Plan: Natural Resources and Environmental Protection* (Oct. 18, 2021), The 2021-22 Spending Plan: Natural Resources and Environmental Protection (ca.gov).

[30] Legislative Analyst's Office, *Assessing Vulnerability of State Assets to Climate Change* (Jan. 9, 2020), https://lao.ca.gov/Publications/Report/4133.

public beaches themselves—lie within a few feet of the present high tide line. Rising sea levels from global warming thus are the main cause of the biggest impacts to California's coastal land, infrastructure, and development, through more frequent flooding and inundation as well as increased cliff, bluff, dune, and beach erosion.[31]

21. In addition, a warming climate in the western United States is causing changes to the wildfire regime, with wildfires increasing in frequency, duration, and severity in the western United States.[32,33,34] A 2016 study published in Proceedings of the National Academy of Sciences concluded that anthropogenic climate change has doubled the cumulative wildfire area burned in the West during 1984–2015.[35]

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[31] G. Griggs, et al. (California Ocean Protection Council Science Advisory Team Working Group), *Rising Seas in California: An Update on Sea-Level Rise Science. California Ocean Science Trust* (Apr. 2017).

[32] Anthony LeRoy Westerling, *Wildfire Simulations for the Fourth California Climate Assessment: Projecting Changes in Extreme Wildfire Events with a Warming Climate* in *California's Fourth Climate Change Assessment*, Cal. Energy Commiss'n, Pub. No. CCCA4-CEC-2018-014 (2018), http://www.climateassessment.ca.gov/techreports/docs/20180827-Projections_CCCA4-CEC2018-014.pdf.

[33] J.K. Balch, et al., *Human-started Wildfires Expand the Fire Niche Across the United States*, 114(11) Proc. of the Nat'l Acad. of Sci. 2946–51 (2017), https://doi.org/10.1073/pnas.1617394114.

[34] Kasha Patel, *6 Trends to Know about Fire Season in the Western U.S.*, NASA, Earth Matters (Nov. 29, 2018), https://earthobservatory.nasa.gov/blogs/earthmatters/category/natural-hazards/.

[35] B.J. Harvey, *Human-caused Climate Change is Now a Key Driver of Forest Fire Activity in the Western United States*, 113 Proc. of the Nat'l Acad. Sci. USA 11649–50 (2016).

California's annual wildfire extent has increased fivefold since the 1970s.[36] This trend was mainly due to an eightfold increase in summertime forest-fire area and was very likely driven by drying of fuels promoted by human-induced warming.[37] Tracking with rising temperatures, California's 2020 fire season was record-breaking, not only because over 4 million acres burned but also because 5 of the 6 largest wildfires in California history occurred in 2020.[38] Some of those fires burned so hot that they created their own tornadoes and lightning storms.[39]

22. California's Fourth Climate Change Assessment[40] states that "[c]limate change will make forests more susceptible to extreme wildfires" and suggests that climate change will lead to wildfires in the next few decades that will be

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[36] Williams, A. P., Abatzoglou, J. T., Gershunov, A., Guzman-Morales, J., Bishop, D. A., Balch, J. K., & Lettenmaier, D. P. (2019). Observed impacts of anthropogenic climate change on wildfire in California. Earth's Future, 7, 892–910. https://doi.org/10.1029/2019EF001210

[37] A.P. Williams, et al., *Observed Impacts of Anthropogenic Climate Change on Wildfire in California*, 7 EARTH'S FUTURE 892–910 (2019), https://doi.org/10.1029/2019EF001210.

[38] John Myers, "California unveils sweeping wildfire prevention plan amid record fire losses and drought," LA TIMES, Apr. 8, 2021, https://www.latimes.com/california/story/2021-04-08/california-wildfire-prevention-536-million-newsom-lawmakers; Burke at al., *The Changing Risk and Burden of Wildfire in the United States*, PNAS 118(2) e2011048118 (Jan. 12. 2021), https://doi.org/10.1073/pnas.2011048118.

[39] A.P. Williams, et al., Observed Impacts of Anthropogenic Climate Change on Wildfire in California, 7 EARTH'S FUTURE 892–910 (2019), https://doi.org/10.1029/2019EF001210.

[40] CA.GOV, California's Fourth Climate Change Assessment, http://www.climateassessment.ca.gov/.

unprecedented in size and severity.[41] If greenhouse gas emissions continue to rise, one study found that by 2100 the frequency of extreme wildfires burning 25,000 acres or more would increase by nearly 50 percent and average area burned statewide would increase by 77 percent.[42]

23. California's wildfire spending has already more than tripled since 2005, because of the climate-change-induced increase in number and severity of wildfires.[43] And the State's 2021-2022 spending plan includes an almost fivefold increase in funding for wildfire prevention and forest health improvement.[44] As greenhouse gas emissions rise and extreme wildfires expand, California's expenditures will only continue to increase, at the expense of other funds and services.

24. Wildfires also damage crops and soil, harm livestock, and create a high-risk environment for agricultural workers. As the largest agricultural-producing state in the U.S., California farmers are carrying an unimaginable burden right now to

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[41] State of California, *California's Fourth Climate Change Assessment: Statewide Summary Report* at 9 (2018), https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018013_Statewide_Summary_Report_ADA.pdf.

[42] *Id.*

[43] Adam Beam, *California Oks new spending on drought, wildfire prevention*, ASSOCIATED PRESS (Sept. 9, 2021), California OKs new spending on drought, wildfire prevention | AP News; *see also* Legislative Analyst's Office, *State Wildfire Response Costs Estimated to Be Higher Than Budgeted*, Fig. 3 (Oct. 19, 2020), State Wildfire Response Costs Estimated to Be Higher Than Budgeted (ca.gov).

[44] Legislative Analyst's Office, *The 2021-22 California Spending Plan: Natural Resources and Environmental Protection* (Oct. 18, 2021), The 2021-22 Spending Plan: Natural Resources and Environmental Protection (ca.gov).

protect their land, animals, families, and workers while providing continued sustenance for the world. Agricultural land restoration efforts are essential after a wildfire but come with a considerable cost at a time when those affected are recovering from substantial losses. In 2020, industry estimates show California growers had losses of $601 million from wine grapes that went unharvested.[45] Estimates on the full economic impact of wildfires on agriculture for the 2020 fire season are still being investigated. For instance, in 2017, fires in Napa and Sonoma caused an estimated $75 million in economic loss, but that number does not account for the loss of buildings used for agriculture proposes. Furthermore, based on the location of many of recent fires, a bigger impact is expected compared to 2017 estimates.

25. Climate change also exacerbates other air pollution problems throughout California. Increasing temperatures generally cause increases in ozone concentrations in California's polluted regions.[46] And increasing frequency and intensity of wildfires is already having a measurable effect on air quality.[47] At one

[45] https://www.recordnet.com/story/news/fire/2021/07/10/california-growers-see-601-m-loss-2020-new-smoke-heat-concern/7926501002/

[46] *E.g.*, American Lung Association, *State of the Air 2018* at 4, https://www.lung.org/assets/documents/healthy-air/state-of-the-air/sota-2018-full.pdf.

[47] Proc. of the Nat'l Acad. Sci. USA (Jul. 16, 2018), pii: 201804353, doi: 10.1073/pnas.1804353115, https://www.ncbi.nlm.nih.gov/pubmed/30012611; *see also* X. Liu, et al., *Airborne Measurements of Western U.S. Wildfire Emissions: Comparison with Prescribed Burning and Air Quality Implications*, 122 J.

point, California came under siege from record-breaking heat waves and smoke from more than 7,000 fires burning simultaneously, and the Bay Area even awoke to an eerie deep-orange sky.[48] Intense heat waves and widespread wildfire smoke caused Southern California to experience worse air pollution readings and highest number of health-damaging bad air-days since the mid-1990s. There were 157 bad-air days for ozone pollution across the vast, coast-to-mountains basin spanning Los Angeles, Orange, Riverside and San Bernardino Counties—the most days above the federal health standard since 1997. A recent study suggests that smoke from wildfires like these is a rapidly growing health threat and could become one of the deadliest climate impacts within decades.[49] Continued climate change will further amplify the number of days with extreme fire weather by the end of the century (absent any additional actions taken in accordance with the U.N. Paris commitments).[50] And particulate

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GEOPHYS. RES. ATMOS. 6108-29 (2017), doi:10.1002/2016JD 026315 (showing that wildfires emit fine particulate matter at over three times the level previously estimated).

[48] Thomas Fuller & Christopher Flavelle, "A Climate Reckoning in Fire-Stricken California," N.Y. TIMES, Sept. 18, 2020, https://www.nytimes.com/2020/09/10/us/climate-change-california-wildfires.html.

[49] Tony Barboza, "Wildfire smoke now causes up to half the fine-particle pollution in Western U.S., study finds," L.A. TIMES, Jan. 13, 2021, https://www.latimes.com/california/story/2021-01-13/wildfire-smoke-fine-particle-pollution-western-us-study (new study blames climate change for worsening air quality and health risks in both urban and rural communities in recent years); Marshall Burke, et al., *The Changing Risk and Burden of Wildfire in the United States*, PNAS 118(2) e2011048118 (Jan. 12. 2021), https://doi.org/10.1073/pnas.2011048118.

[50] Michael Goss, et al., *Climate Change is Increasing the Risk of Extreme Autumn Wildfire Conditions Across California*, ENVT'L RES. LETTERS (2020), DOI: 10.1088/1748-9326/ab83a7.

matter exposure is a heightened problem during droughts, which climate change is also anticipated to exacerbate in California as changes in weather patterns block rainfall from reaching the State.[51,52] Worse air quality leads to increased risk for respiratory infections like bronchitis and pneumonia, which will result in greater health costs to the State.[53,54,55]

26. Despite successes in increasing agricultural yields in the state, the effect of extreme droughts have already started hurting agricultural productivity, decreasing the State's water reserves and exacerbating fugitive dust emissions. We can expect more extreme droughts to continue into the end of the 21st century, with decreased precipitation frequency from fewer non-atmospheric river storms and long-term declines in groundwater, which cannot frequently recover from subsequent wet

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[51] A.P. Williams, et al., *Contribution of Anthropogenic Warming to California Drought During 2012-2014*, 42 GEOPHYS. RES. LETT. 6819–28 (2015), http://doi.org/10.10022015GL064924.

[52] I. Cvijanovic, B.D. Santer, C. Bonfils, C. et al., *Future Loss of Arctic Sea-ice Cover Could Drive a Substantial Decrease in California's Rainfall*, 8 NAT. COMMUN. 1947 (2017), https://doi.org/10.1038/s41467-017-01907-4.

[53] John A. Romley, Andrew Hackbarth & Dana P. Goldman, *Cost and Health Consequences of Air Pollution in California*, Santa Monica, CA, RAND Corp. (2010), https://www.rand.org/pubs/research_briefs/RB9501.html.

[54] M. Wang, C.P. Aaron, J. Madrigiano, et al., *Association Between Long-term Exposure to Ambient Air Pollution and Change in Quantitatively Assessed Emphysema and Lung Function*, 322(6) J. AM. MED. ASSOC. 546-56 (2019), doi:10.1001/jama.2019.10255.

[55] A. Inserro, *Air Pollution Linked to Lung Infections, Especially in Young Children*, AM. J. MANAGED CARE (May 6, 2018), https://www.ajmc.com/newsroom/air-pollution-linked-to-lung-infections-especiallyin-young-children.

weather conditions. As reported in IPCC 2021 AR6,[56] there is high confidence that groundwater depletion has occurred since at least the start of the 21st century as a consequence of groundwater withdrawals for irrigation in agricultural areas in drylands (e.g., the United States southern High Plains and California Central Valley). In California, where a $50 billion agricultural industry grows more than a third of the country's vegetables and two-thirds of its fruits and nuts, farmers have seen wells dry up and access to State surface water allocations slashed to zero. If greenhouse gas emissions continue to rise, California's agricultural industry will be increasingly harder hit, with both revenues decreasing and food prices for residents increasing.

27. Increased greenhouse gas emissions from returning to the SAFE Final Rule standards will worsen these climate impacts throughout California.

I certify under penalty of perjury under the laws of the State of California and the United States of America that the foregoing is true and correct to the best of my knowledge and belief.

Executed on December 30, 2021, at Sacramento, County of Sacramento, California.

Elizabeth Scheehle

ELIZABETH SCHEEHLE

56 https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf

DECLARATION OF GEORGE S. ABURN, JR.

I, George S. Aburn, Jr., declare as follows:

1. I am employed as the Director of the Air and Radiation Administration ("ARA") within the Maryland Department of the Environment ("MDE" or "the Department"). I have held this position since February 2006. In this capacity, among other responsibilities, I oversee management of the state's climate change, air quality compliance, air monitoring, and air planning programs, as well as, other efforts by Maryland to reduce and/or respond to the impacts of air pollution, including greenhouse gas ("GHG") emissions.

2. I submit this declaration in support of the States' Motion to Intervene in Petitioners challenge the U.S. Environmental Protection Agency's ("EPA") promulgation of federal GHG emissions standards for model years 2023 through 2026 passenger cars and light trucks.

3. In April 2020, EPA revised and weakened its standards for model years 2021 through 2025 and promulgated similarly weak standards for model year 2026. 85 Fed. Reg. 24,174 (April 30, 2020) (SAFE 2). Maryland was one of the states that challenged the SAFE 2 standards in this court.

4. In August 2021, EPA proposed to increase the stringency of its GHG standards for model years 2023 through 2026, and in December 2021 finalized its

standards with the Revised 2023 and Later Model Year Light-Duty Vehicle GHG Emissions Standards, 40 CFR Parts 86 and 600. EPA estimates its new standards will reduce 3.1 billion tons of GHG emissions by 2050, which is 50 percent greater than SAFE standards, and will also reduce emissions of some criteria pollutants and air toxics, resulting in important public health benefits.

5. This proposal has the potential to offer substantial benefits and emission reductions that are needed for Maryland to attain and/or maintain clean air, mitigate the effects of climate change, and continue to make progress reducing nitrogen deposition to the Chesapeake Bay.

PERSONAL BACKGROUND AND QUALIFICATIONS

6. Prior to my appointment as Director, I served as the Department's Manager of Air Quality Planning and Monitoring Program for 14 years. In that position, I was responsible for the development of state plans to achieve compliance with National Ambient Air Quality Standards, new regulatory initiatives and adoption of air quality control regulations, as well as education and outreach efforts. I have worked in air quality control programs for MDE, and its predecessor agency, in various capacities for over 30 years. I received a Bachelor's Degree in Environmental Engineering from Brown University in 1978.

7. In my professional capacity, I have served as Chairman of various working committees for the Ozone Transport Commission. I am on the Board of

Directors for the Mid-Atlantic Regional Air Management Association, and I am a two-term past President of the National Association of Clean Air Agencies ("NACAA"). I currently serve as the Co-Chair of NACAA's Criteria Pollutant Committee.

8. In a career that has spanned more than 30 years, addressing climate change has been one of the biggest challenges I have encountered working on air pollution policy and control. I have managed Maryland's efforts to identify every feasible control program that could provide some meaningful benefit. I have organized, funded, and been part of over 10 years of research related to climate change and efforts to reduce GHG emissions. I have worked with other states to try and adopt regional control programs to reduce GHG emissions, such as the Regional Greenhouse Gas Initiative ("RGGI").

9. Climate change is an urgent threat, and all levels of government and nongovernment organizations must take increasingly aggressive and balanced actions to reduce GHG emissions and increase community resiliency. Maryland is a national leader in this area, realizing substantial reductions in emissions since the first Greenhouse Gas Reduction Act ("GGRA") was passed in 2009, with Governor Hogan's administration taking bold new actions to achieve significant progress. The World Resources Institute recently recognized Maryland's leadership with their finding that Maryland was the number one state for reducing GHG emissions while

growing our economy. While Maryland has taken many measures on its own, Maryland needs a strong partnership with the federal government and other states to mitigate and adapt to the effects of climate change.

EFFORTS TO MITIGATE CLIMATE CHANGE IN MARYLAND

10. In 2007, the Maryland Commission on Climate Change ("MCCC") was established, and charged with evaluating and recommending state goals to reduce Maryland's GHG emissions to 1990 levels by 2020, and to reduce those emissions to 80% of their 2006 levels by 2050. The MCCC was also tasked with developing a plan of action that addressed the causes and impacts of climate change, which includes firm benchmarks and timetables for policy implementation. As a result of the work of more than 100 stakeholders and subject matter experts, the MCCC produced a climate action plan.

11. That plan was the impetus of Maryland's GGRA. This groundbreaking law requires statewide, science-based reductions in the GHGs that are changing our climate and threatening our health. In order to achieve those reductions, GGRA also requires the creation of Maryland's Greenhouse Gas Reduction Plan. Maryland's Greenhouse Gas Reduction Plan initially laid out state actions to achieve the required 25% reduction in GHGs from 2006 levels by 2020. The GGRA specifically requires the development of a baseline inventory for 2006. This inventory was developed based on six categories of heat retaining gases: carbon dioxide, methane, nitrous

oxide, sulfur hexafluoride, hydrofluorocarbons and perfluorocarbon. These gases have various global warming potentials, with gases like methane, having a higher global warming potential than carbon dioxide.

12. The GGRA directed the state to reduce climate pollution by 25% by 2020, and led to the creation of Maryland's wide-ranging Greenhouse Gas Reduction Plan, which includes more than 150 programs. Through the plan, Maryland remains committed to implementing smart environmental and economic strategies, such as increasing clean energy use, helping customers save energy and money through Maryland's EmPower program, and participating in RGGI, a regional program that reduces carbon pollution from fossil fuel fired power plants.

13. More recently, on April 4, 2016, Governor Larry Hogan signed the landmark Greenhouse Gas Emissions Reduction Act of 2016 into law. The law further extended the goal to a 40% reduction in GHGs from 2006 levels by 2030, and 80% by 2050, requiring long-term cuts in pollution. Last year, the Department published an updated 2030 GGRA Plan wherein the Department and the other Maryland state agencies advanced a portfolio of measures that will reduce Maryland's 2030 GHG emissions to 48.7% below 2006 levels.

CLIMATE CHANGE HARMS THREATENING MARYLAND

14. The climate in Maryland and the rest of the northeastern U.S. is currently trending warmer and wetter, a trajectory that is expected to continue.

Maryland has experienced an increase in annual average temperature of 1.5°F since the beginning of the 20th century, and a winter warming trend reflected in the average of less than one day per year of nights below 0°F since the mid 1990's, as compared to an average of two nights per year between 1950 and 1994. Annual precipitation, though more variable, increased by approximately 0.39 inches per decade in the northeast during this same time, with Maryland's annual mean precipitation having been above average for the past two decades. With more than 3,000 miles of coastline, Maryland's coast is particularly vulnerable to rising sea levels and the more extreme weather events associated with climate change including shoreline erosion, coastal flooding, storm surges, inundation, and saltwater intrusion into groundwater supplies.

15. Heat waves are likely to increase in frequency, intensity and duration corresponding directly to increases in emissions; and Maryland is expected to have a notable increase in days with extreme heat (over 90 ° F) by 2050, as compared to the late 1900's. The trend in average precipitation is expected to remain seasonal, increasing in the winter and spring, with less change expected in the fall and summer. Combined with the higher summer temperatures, greater evaporation and earlier snowmelt will create a risk of drought during the growing season (significant for both ecosystems and human systems). Additional impacts in Maryland could include increased frequency and severity of other existing problems such as storms,

flooding, and forest fires, as well as erosion, saltwater intrusion and inundation of low- lying areas along the state's shoreline and coast.

16. In terms of health impacts, the average number of days for which Maryland is likely to exceed temperatures of 90 ° F or higher is expected to rise considerably, markedly exacerbating heat-related illnesses and mortality, particularly among the elderly. Pollution, excessively warm temperatures, and other environmental factors such as extreme precipitation have also been shown to increase the risk of a number of infectious diseases.

17. Agriculture in Maryland will be affected. In 2016, the market value of all agricultural products was over $2.3 billion. Maryland's total production in 2017 included over $1 billion in broiler chickens, $699 million in field crops, and $169 million in milk. Poultry farms, the highest grossing agricultural industry in the state, are expected to see increased summer cooling costs, decreased growth rates, increased mortality, and increased risk of disease with increasing temperatures, challenging already slim margins. Increased frequency of summer heat stress has the potential to negatively affect both field crops and milk production yields, and may amplify water demand, increasing the risk of over pumping groundwater for irrigation. This latter tendency, combined with sea level rise, places unconfined aquifers exposed to the freshwater-saltwater interface at risk from saltwater intrusion.

18. Changes in temperature and precipitation are also likely to alter the types of crops that can be grown in a given region, similar to the effects on natural plant populations. The seasonality of trends in temperature and precipitation is also particularly relevant to the agricultural sector. Combined with the higher summer temperatures, this will likely increase the intensity of any droughts during the growing season. Perennial crops such as fruit trees and vines are also at risk as their life cycles rely on particular seasonal cues. In 2017, Maryland's apple and peach orchards produced over $11.5 million utilized for fresh eating and in processing. Additionally, the state has 858 acres of vineyards, 70% of which are owned by wineries that sold $47 million worth of product in 2015.

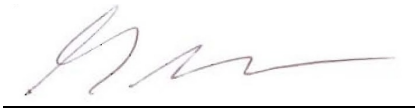
19. Businesses involved in the state's tourism sector are also likely to feel the impact of climate change. In 2016, Maryland visitors spent $17.3 billion dollars, more than 60% of which was in the industries of transportation, food and beverage, and lodging. Tourism in the state supported 146,012 direct full-time equivalent jobs in that year, bringing in wages of approximately $6 billion; while visitor spending generated over $2.3 billion in state and local taxes. Without action, the natural beauty of the state could suffer the effects of climate change, depriving Maryland residents and visitors of a wealth of experiences.

20. Finally, the Chesapeake Bay is the largest estuary in the United States, fed by a watershed that stretches from mountains to sea across 64,000 square miles

(166,000 square kilometers), spanning six states - Maryland, Delaware, Virginia, West Virginia, Pennsylvania, and New York - and the District of Columbia. However, human development and pollution have degraded the natural resilience of the ecosystems of the Bay and its watershed, leaving them more vulnerable to extreme events. Climate change will likely exacerbate this problem, creating a greater threat to these ecosystems. The Chesapeake Bay fisheries are expected to be impacted by a combination of environmental stressors, including basic water quality issues that include changes in temperature, salinity, and dissolved oxygen, as well as habitat loss due to sea level rise and projected impacts on submerged grasses. Many commercially important fisheries species are projected to move northward as waters warm and suitable habitats shift and, as previously noted, this shift could also bring new pests or increase the damages done by diseases such as bacteria that thrive in warmer waters. Maryland's seafood industry contributes nearly $600 million to the state economy each year. In 2016, the commercial landings value of Maryland's seafood industry was $90,361,277. Within the state, the blue crab remained the most lucrative species by far, accounting for over $54 million in revenue in 2015, with the oyster coming in second at $15 million. In addition to concerns regarding ocean acidification, oysters may be at an increased risk of suffocation by sediment loads, exposure to low-oxygen dead zones, and damages from the diseases, all of which

have contributed to the historic decline of the oyster population and may be exacerbated directly or indirectly by the changing climate.

I declare under penalty of perjury that the foregoing is true and correct.



George S. Aburn, Jr.

12-21-21
Date

DECLARATION OF JAY CHAMBERLIN

I, Jay Chamberlin, state and declare as follows:

1. I submit this declaration in support of the State of California's standing to intervene in support of the final action of the United States Environmental Protection Agency ("EPA"), the "Revised 2023 and Later Model Year Light-Duty Vehilce Greenhouse Gas Emissions Standards" ("Action"). I make this declaration of my own personal knowledge, unless otherwise indicated.

2. I am the Chief of the Natural Resources Division of the California Department of Parks and Recreation ("Department"), a position I have held since 2010. I have worked in the conservation field for more than 20 years. I received a Masters of Science in Natural Resources and Environment from the University of Michigan in 1998. Prior to my current position, I served as Environmental Program Manager at the California Department of Water Resources from 2008 to 2010, and Deputy Assistant Secretary at the California Natural Resources Agency from 2005 to 2008. I have also worked as a consultant to the Ecosystem Restoration Program for the California Bay-Delta Authority, and as Policy Manager for the Pacific Forest Trust, where my work focused on climate projects and policies.

3. I regularly give presentations on climate change and its impacts to the California State Park System, and on plans, management practices, and policies for addressing those impacts. I have given such presentations to professionals, students

and other audiences, including, for example, the California State Assembly's Select Committee on Sea Level Rise and the California Economy. I have also given a series of climate change presentations and updates (in January 2018, September 2018, and May 2019) to the California State Parks and Recreation Commission, the body with authority for guiding policy and planning for the State Park System.

4. The Department manages the California State Park System, which consists of 280 park units and approximately 1.6 million acres of land. Parks are located in every bioregion of California, and the State Park System protects some of the most important natural resources in California, including old growth forests, grasslands, woodlands, lakes and reservoirs, habitat for native and rare wildlife, and roughly one-quarter of the California coastline. The State Park System also protects the largest assemblage of cultural resources in California, including historic buildings and archaeological sites. The State Park System receives in excess of 80,000,000 visitors per year, and it is the primary destination for shoreline recreation in California.

5. I am familiar with scientific studies and models related to global climate change and with evidence of the influence that climate change is having on resources in the State Park System. My knowledge is based on my ongoing review of the current scientific literature, attendance and participation at professional conferences, trainings, and workshops, and my work for the Department.

6. For years, Department staff have been engaged in active management, documentation, and monitoring of resource conditions throughout the State Park

System. Many of the specific threats to biological diversity and native species that have emerged in recent years are attributable to, or compounded by, the influence of climate change. Climate-influenced impacts on State Park System resources include accelerated coastal erosion, the spread of pests and pathogens (such as bark beetles), changes in phenology (the timing of seasonal natural phenomena such as blossoms on trees or flowers), alterations to wildlife health and behavior, and increases in the frequency and severity of wildfires. These changes in natural systems due to climate change damage the land, native plants, and wildlife that are the primary natural resources of the State Park System. In the course of my work, I have reviewed information and reports by the Department and other agency staff concerning these phenomena.

7. Scientific models of global climate change—which link the buildup of greenhouse gases to increased global temperatures—predict that by the year 2100 the average annual maximum daily temperature in California will increase by 5.6 to 8.8 degrees Fahrenheit. Scientific studies and models further predict that—as a result of increased temperatures, and consequent thermal expansion and glacial ice melt, caused by greenhouse gas emissions—by 2100, mean sea levels along the coast will rise between 1 and 7 feet, greatly exacerbating the effects of wave run up (the upper level reached by a wave on a beach) and storm surges. Due to uncertainty in the models, actual mean sea level rise could well exceed the predicted levels by considerable

margins. Also, sea level rise will vary by location, and certain areas could experience sea levels that exceed the predicted mean levels.

8. Based upon my professional experience and knowledge of California's State Park System, if the predicted changes in temperature, precipitation, and sea level occur, they would have significant adverse and costly impacts on the State Park System, including those I summarize below. Additional emissions of greenhouse gases will continue to drive climate change and worsen these impacts in the future.

9. Rising sea levels will drastically reduce the amount of beach available for shorebirds, including threatened and endangered species. In fact, many of California's beaches, including many in the State Park System, such as Crystal Cove in Orange County, are narrow bands of sand backed by steep cliffs. If the sea level rises as models predict, many beaches will not simply move inland, but will completely disappear. Also, any additional rise in sea level will affect the salinity, temperature, and hydrology in California's many estuaries and lagoons, thereby harming the aquatic life—including rare, threatened and endangered fish—that rely on estuaries for breeding or rearing. In addition, sea level rise threatens infrastructure in the more than 100 coastal units of the State Park System, including numerous campgrounds, trails and roads, and other facilities, including water and waste systems that exist along the ocean's edge. The reduced or destroyed beaches, coastal estuaries, lagoons, and wetlands and the destruction of other fish and wildlife habitats are material impacts to State trust resources. Moreover, damaged infrastructure will also negatively impact

the ability of visitors to access the coast, another material impact to the purpose of State Beaches to provide for recreational access to the coast. Finally, sea level rise will negatively impact the balance of payments of the State—as revenues from visitors may decline even as costs to maintain, restore, and protect park resources and facilities increase.

10. In addition, the California State Park System includes many important cultural resources, including archeological and historic sites, such as Native American sites, 18th century missions, historic lighthouses and piers, and buildings, including historic campgrounds and other sites constructed by the Civilian Conservation Corps. These resources are irreplaceable, and the protection or documentation of cultural resources that would be inundated by sea level rise would be very expensive. For instance, even a small rise in sea level will erode or inundate many of the State Park System's ancient shell middens. These cultural resources, which contain remnants from California's earliest human residents, date back thousands of years and would be permanently lost for their descendants and for visitors and researchers as well.

11. Global climate change models in combination with other predictive studies also suggest that wildfires will increase in frequency and severity. The State's recent experiences concerning wildfires are generally consistent with these predictions. In 2021, the highest temperature in recorded human history was recorded in California, at Death Valley National Park, exceeding the previous record set in the same location in 2020. Over the last 40 years, California's fire season has increased by

an estimated 75 days—and in some places in the State the fire season is nearly year-round. Eighteen of the 20 largest wildfires in the State's recorded history have occurred since 2000, with 13 of those occurring since 2010.

12. Increases in the frequency and severity of wildfires will have a significant impact on the State Park System. The Department and its allied agencies, including the California Department of Forestry and Fire Protection, currently expend significant resources both to protect park infrastructure and natural and cultural resources from wildfires, and to prevent these fires. Growing wildfire activity also increases the risk that irreplaceable resources will be lost, including historic structures. Over the last 15 years, numerous state parks have been impacted by wildfires, and the increasing frequency of wildfires has become a more important problem for the State Park System. In 2020, the wildfires that collectively burned more acres of California than at any time since fire records have been kept burned more than 115,000 acres of the State Park System across 22 State Park units. In Big Basin Redwoods State Park – California's first state park – the entire park headquarters, including buildings that were designated national historic landmarks, were completely destroyed during the CZU complex fires in August of 2020. The old growth redwood forest is expected to recover but old growth trees and associated wildlife that are by definition irreplaceable resources were also lost. Previously, the October 2017 Wine Country fires in Napa and Sonoma Counties burned through several state parks, including Trione-Annadel State Park, Sugarloaf Ridge State Park, and Robert Louis Stevenson State Historic

Park, and threatened Jack London State Historic Park, while the 2018 Woolsey Fire burned through several state parks including Malibu Creek State Park, Leo Carrillo State Park, and parts of Point Mugu State Park.

13. Observed changes, along with global climate change models, also suggest that coastal fog declines observed in recent decades could accelerate due to greenhouse gas-driven warming and changed ocean circulation. Diminished fog would have a severe and damaging impact on natural forest types that are dependent upon fog, including the endangered Torrey pine, the Monterey pine, and the Coast redwood. In addition to their ecological importance, these forest types draw many visitors to the State Park System, and a decline in these forests would constitute a critical impact on the natural resources of the State Park System and would result in fewer visitors and a loss of revenue to the Department.

14. The Department also manages several parks in winter snow areas, as well as the Sno-Park Program for California, which provides the public roadside access to winter sports recreation. Global climate change models and other studies predict reductions in winter-spring snowpack, which would result in loss of recreational opportunities and increased flooding downstream, along with operational challenges and associated costs at reservoir parks. It may also reduce revenues associated with the Sno-Park Program.

15. According to EPA, increasing the stringency of the federal greenhouse gas emission standards in the Action will result in the reduction of 3.1 billion tons of

greenhouse gas emissions by 2050. This is a stark contrast to the previous standards, which EPA projected would cause the emission of an additional 867–923 million metric tons of greenhouse gases. 85 Fed. Reg. 24,274, 24,180–81 (April 20, 2020). While significant and unavoidable impacts from climate change are already impacting the resources of the State Park System as summarized above, the most extreme impacts of climate change on the State Park System likely depend on current and future greenhouse gas emissions and measures taken to reduce those emissions. Vacating the standards finalized in the Action would increase emissions of greenhouse gases from motor vehicles and exacerbate the impacts to the State Park System of the type I have described in this declaration.

I state under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge and belief.

Executed on December 27, 2021 in Ashton, Maryland.

DocuSigned by:
Jay Chamberlin
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JAY CHAMBERLIN

DECLARATION OF LISA BERRY ENGLER

I, Lisa Berry Engler, declare of my personal knowledge as follows:

1. I am currently employed by the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) as Director of the Office of Coastal Zone Management (CZM). CZM is the lead policy and planning agency on coastal and ocean issues in Massachusetts. I have held this position for three years. I have been employed by CZM since 2011, having held positions with increasing responsibility. I previously held the positions of Assistant Director, Boston Harbor Regional Coordinator, Acting Director for the Massachusetts Bays National Estuary Program (MassBays), and MetroBoston Regional Coordinator for MassBays. Prior to joining CZM, I held positions with the Massachusetts Department of Transportation and the Massachusetts Department of Conservation and Recreation.

2. I have extensive professional knowledge and experience regarding the impacts of climate change on coastal resources and communities in Massachusetts, as well as Massachusetts' efforts to plan and prepare for such impacts. My job duties include providing oversight and administration for CZM and directing policy development, planning efforts, and technical approaches for CZM program areas. I supervise a team of 34 multidisciplinary professionals working in a range of program areas, including climate change adaptation and coastal resilience

administered as CZM's StormSmart Coasts Program. Many of the staff I oversee have significant professional experience in coastal and environmental management, planning, science, policy, and other related fields. I routinely engage and partner with scientific and technical subject matter experts in federal agencies and academia. As part of my management responsibilities, I oversee CZM's work to provide information, strategies, tools, and financial resources to support communities and people working and living on the Massachusetts coast to address the challenges of erosion, flooding, storms, sea level rise, and other climate-change impacts. For instance, I oversee the development of sea level rise decision-support tools and services including inundation maps and guidance documents. I also direct CZM's work to provide policy and planning support and technical assistance to other state agencies, local communities, and private entities regarding adapting and increasing resilience to current and future impacts of climate change on our coast. For example, I oversee CZM's StormSmart Coasts Program that offers competitive grants, hands-on technical and planning assistance, and decision-support tools to Massachusetts cities and towns and non-profit organizations for the purposes of planning for and adapting to sea level rise and other climate-change-related coastal hazards.

3. In my role with CZM, I chair and participate in various legislative and executive branch groups, including the Massachusetts Ocean Advisory

Commission and Science Advisory Council and associated work groups. I also represent the Commonwealth of Massachusetts (Commonwealth) on several multi-state organizations, including the Coastal States Organization, Northeast Regional Ocean Council, and the Gulf of Maine Council on the Marine Environment.

4. I have a bachelor's degree in Biology from Colby College and a master's degree in Environmental Management from Duke University.

5. I am aware of and familiar with the science related to global and local climate change. My knowledge comes from my review of scientific peer-reviewed literature and consensus assessment reports, attendance at professional conferences and workshops, and professional exposure to other research and material. As a result of my professional experience and my knowledge of the peer-reviewed literature and reports, as well as my knowledge of the Massachusetts coastal resources and policies and planning related thereto, I can attest to the following.

6. The purposes of this declaration are to: (i) briefly describe the serious harms that climate change, caused in part by motor vehicle emissions, is causing and will continue to cause to Massachusetts' coastal resources, infrastructure, and communities; and (ii) briefly summarize extensive state and local initiatives, programs, and plans to respond to and prepare for such impacts.

7. I am submitting this declaration in support of the States of California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Maine, Maryland, Michigan,

Minnesota, Nevada, New Jersey, New Mexico, New York, North Carolina, Oregon, Rhode Island, Vermont, Washington, and Wisconsin, the Commonwealths of Massachusetts and Pennsylvania, the District of Columbia, the Counties of Denver and San Francisco, and the Cities of Denver, Los Angeles, New York, and San Francisco (collectively, Movant-Intervenor States) March 8, 2022 Motion to Intervene in Support of Respondent United States Environmental Protection Agency (EPA) in *State of Texas, et al. v. Environmental Protection Agency*, United States Court of Appeals for the District of Columbia Circuit, No. 22-1031 (and consolidated cases). In these cases, Petitioners challenge the final action of the EPA entitled *Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions Standards*, 86 Fed. Reg. 74,434 (Dec. 30, 2021) (Final Action). In that rule, the EPA established new standards for controlling greenhouse gas emissions for passenger cars and light trucks in Model Years 2023-2026.

Climate Change Threatens Massachusetts' Coastal Resources and Communities

8. The accelerated rate of global sea level rise and the severity and timing of coastal impacts due to this rise in sea level are largely dependent on current and future global greenhouse gas emissions, including carbon dioxide emissions, and reduction measures. Climate scientists have high confidence that anthropogenic drivers have been the dominant cause of global mean sea level rise

since 1970.[1] Continued emissions of greenhouse gases, including from motor vehicles, will result in increases in global temperature, yielding additional contributions to global sea level rise (*i.e.*, increased contributions from thermal expansion of warmer waters and melting of land-based ice sheets).[2]

9. According to the U.S. Global Change Research Program, human-caused climate change has led to a rise in global mean sea levels of 8 inches since 1900, and a rate of rise greater than that in any preceding century in the last 2,800 years.[3] Global average sea levels will continue to rise by 1 to 4 feet by 2100, and emerging science regarding Antarctic ice sheet instability indicates sea level rise of as much as 8 feet by 2100 cannot be ruled out.[4] Due to the relationship of the East Coast to the Gulf Stream and melting Antarctic ice sheets, sea level rise will be higher than the global average on the East Coast of the United States.[5]

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[1] Oppenheimer, M., B.C. Glavovic et al., *Chapter 4: Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities, in* IPCC SPECIAL REPORT ON THE OCEAN AND CRYOSPHERE IN A CHANGING CLIMATE (H.-O. Pörtner et al. eds., 2019).

[2] *See generally* U.S. GLOBAL CHANGE RESEARCH PROGRAM, CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT, VOLUME I (D.J. Wuebbles et al. eds., 2017), https://science2017.globalchange.gov/.

[3] *Id.* at 10.

[4] *Id.*

[5] *Id.*

10. A March 2018 report entitled *Massachusetts Climate Change Projections* (2018 Projections Report), informed by a team of scientists from the U.S. Department of the Interior's Northeast Climate Adaptation Science Center at the University of Massachusetts Amherst, presents the best available, peer-reviewed science on climate change downscaled, or localized, for Massachusetts through the end of this century.[6] The 2018 Projections Report identifies substantial increases in air temperature, precipitation, and sea levels across Massachusetts as a result of human-caused greenhouse gas emissions.

11. A key component of the 2018 Projections Report is sea level rise projections for the state's coastline. The analysis for Massachusetts consisted of a probabilistic assessment of future relative sea level rise at tide gauge stations with long-term records at Boston Harbor, MA, Nantucket, MA, Woods Hole, MA, and Newport, RI.[7] The sea level projections are based on a methodology that provides complete probability distributions for different greenhouse gas emissions

[6] MASSACHUSETTS CLIMATE CHANGE PROJECTIONS (2018), https://nescaum-dataservices-assets.s3.amazonaws.com/resources/production/MA%20Statewide%20and%20MajorBasins%20Climate%20Projections_Guidebook%20Supplement_March2018.pdf.

[7] *See id.* at 11 (citing Robert M. DeConto & Robert E. Kopp, *Massachusetts Sea Level Assessment and Projections*, Technical Memorandum (2017).

scenarios.[8] Working with the principal investigators (Robert DeConto and Robert Kopp) and a team of external peer reviewers, CZM reviewed and synthesized the downscaled projections, which are made available by the Commonwealth, to set forth a standard set of sea level rise projections to be used by municipalities, state government, industry, the private sector, and others to assess vulnerability and identify and prioritize actions to reduce risk. Given a high emissions pathway (Representative Concentration Pathway 8.5), Massachusetts is projected to experience approximately 4.0 to 7.6 feet of sea level rise over the twenty-first century (99.5% probability), with as much as 10.2 feet possible when accounting for higher ice sheet contributions (99.9% probability).

12. Massachusetts has 2,819 miles of tidal coastline, and a coastal zone (land areas from the shoreline to 100 feet inland of major roads or railways from New Hampshire to Rhode Island) that encompasses 886 square miles. Approximately 5.1 million people or 75% of the Commonwealth's population reside in coastal counties. In 2018, the total output of the Massachusetts economy across all industries in coastal shoreline counties was $487.7 billion.[9]

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[8] *See id.* (citing Robert E. Kopp et al., *Probabilistic 21st and 22nd century sea level projections at a global network of tide gauge sites*, 2 EARTH'S FUTURE 383–406 (2014)).

[9] NAT'L OCEAN ECONOMICS PROGRAM, STATE OF THE U.S. OCEAN AND COASTAL ECONOMIES: COASTAL STATES SUMMARIES – 2016 UPDATE 29 (2016),

Approximately 170,000 year-round residents are currently (as of the 2010 U.S. census) located within coastal flood hazard areas, as defined by the Federal Emergency Management Agency (FEMA), and are susceptible to 1% annual chance coastal storm flooding under current sea level conditions.[10] Accelerated sea level rise will lead to more regular flooding of developed and natural coastal areas due to an increase in the extent of tidal inundation, and will also exacerbate erosion along beaches, dunes, and coastal banks.

13. In addition, there is very high confidence that climate change and sea level rise will increase the frequency and extent of flooding associated with coastal storms, such as hurricanes and nor'easters.[11] Moderate to major coastal storm events will cause inundation of larger areas, and will occur more frequently, damaging or destroying coastal engineering structures such as seawalls; critical infrastructure such as pump stations, wastewater treatment plants, and transportation systems; and businesses and private property.

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http://midatlanticocean.org/wp-content/uploads/2016/03/CoastalStatesSummaryReports_2016.pdf.

[10] *See* Mark Crowell et al., *Estimating the United States Population at Risk from Coastal Flood-Related Hazards*, *in* COASTAL HAZARDS, 151, 167 (Charles W. Finkl ed., 2013), https://tinyurl.com/yaolf6bk.

[11] *See* U.S GLOBAL CHANGE RESEARCH PROGRAM, *supra*, at 27.

14. More frequent severe storm surges will create serious risks for public safety and health, especially where roads, sewer mains, and pump stations are impacted. Frequent tidal flooding from sea level rise may also lead to increases in respiratory diseases due to mold from dampness in homes.[12] Saltwater intrusion—or the increased penetration of salt water into sources of fresh water—from sea level rise will impact water resources (such as drinking water) by contaminating freshwater sources with salt water and also through the corrosion of water supply infrastructure.

15. The Massachusetts coast includes a diverse array of marine and estuarine ecosystems including, among others, sandy beaches, rocky shores, barrier beaches, islands, and salt marshes. These ecosystems offer immense commercial, recreational, cultural, and aesthetic values to the residents of and visitors to the Commonwealth, while also serving important ecological functions. For instance, natural coastal resources, especially beaches and salt marshes, provide valuable coastal resilience services to the Commonwealth by buffering inland coastal communities and the built environment from waves and storm surges. Salt water

[12] *See generally* CENTERS FOR DISEASE CONTROL & PREVENTION, U.S. DEP'T OF HEALTH & HUMAN SERVS., COASTAL FLOODING, CLIMATE CHANGE, AND YOUR HEALTH: WHAT YOU CAN DO TO PREPARE (2017), www.cdc.gov/climateandhealth/pubs/CoastalFloodingClimateChangeandYourHealth-508.pdf.

will also impact natural coastal resources, as saltwater intrusion into salt marshes and freshwater wetlands will alter the composition of plant species and affect wildlife that depend on these ecosystems.

Massachusetts is Experiencing Economic Impacts from Climate Change and is Expending Significant Resources to Adapt and Prepare for Impacts of Climate Change on Our Coastal Areas

16. The Commonwealth is already experiencing impacts of climate change. The relative sea level trend at the Boston tide station is (+) 2.87 millimeters per year based on monthly mean sea level data from 1921 to 2020, which is equivalent to a change of 0.94 feet over 100 years.[13]

17. These impacts are directly harming the welfare of Massachusetts residents and causing significant economic losses. Coastal storms currently result in flooding with extensive damages to public infrastructure, private homes and businesses, and a significant demand for emergency response and recovery services. For example, a nor'easter on March 2–3, 2018, which reached the third-highest water level recorded at the Boston Harbor tide gauge, resulted in major flooding, damages, and expenditures for response and recovery.

[13] *See* Nat'l Oceanic & Atmospheric Admin., *Relative Sea Level Trend 8443970 Boston, Massachusetts*, TIDES & CURRENTS, https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8443970.

18. Rising sea levels increase the frequency, depth, and duration of coastal flooding events; and the associated magnitude of damage costs, including costs associated with the increased demand on first responders, will escalate accordingly.

19. Sea level rise and other impacts of a changing climate pose major risks to communities in Massachusetts' coastal zone. Looking out to the end of the century, a 2018 study analyzed the number of coastal homes and commercial properties throughout the United States that will be at risk from frequent tidal flooding (meaning at least 26 higher tides per year) as a result of projected sea level conditions without any storm events.[14] In Massachusetts, over 89,000 existing homes and 8,000 commercial properties may be disrupted by chronic tidal flooding or inundation by 2100 under a high-emissions scenario. The 2018 market value of residential buildings at risk of higher tides in 2100 was estimated at $63 billion, and these homeowners currently contribute over $400 million to the local property tax base.[15]

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[14] *See* UNION OF CONCERNED SCIENTISTS, UNDERWATER: RISING SEAS, CHRONIC FLOODS, AND THE IMPLICATIONS FOR US COASTAL REAL ESTATE (2018), www.ucsusa.org/resources/underwater.

[15] *See* Massachusetts-specific data available at: www.ucsusa.org/sites/default/files/attach/2018/06/underwater-data-by-state.xlsx.

20. Development along the Massachusetts coast is afforded protection from coastal buffers such as beaches and dunes, and from engineered coastal infrastructure such as revetments and seawalls. These coastal engineered structures will experience greater impacts from flooding and wave energy from the anticipated increase in frequency and intensity of coastal storm events associated with accelerated sea level rise and climate change. With these greater impacts will come more frequent need for maintenance and replacement of coastal engineered structures as well as beaches in the form of sediment nourishment at significant costs. For example, the Town of Winthrop needed additional protection from storm surge and flooding impacts for a suburban neighborhood with existing engineered shoreline structures (*i.e.*, seawalls, groins, and breakwaters) and an eroding beach. At a cost of approximately $25 million in state funding, 460,000 cubic yards of sand, gravel, and cobble were placed along 4,200 linear feet of shoreline in 2013–2014. The community gained approximately 150 feet of beach width at high tide and increased protection against wave energy and coastal storms. Other communities across Massachusetts (*e.g.*, New Bedford, Rockport, Duxbury, and Scituate) have worked to design beach nourishment projects and address erosion and failing coastal engineered structures that will be exacerbated by accelerated sea level rise and increased flooding from coastal storms. As described below, the

Commonwealth provides substantial funding for these projects to protect coastal communities and their residents and businesses.

21. Coastal engineered structures, such as seawalls and revetments, have been constructed along over a quarter of the Commonwealth's ocean-facing shoreline to protect public and private infrastructure and assets from flooding and erosion. The Commonwealth and its municipalities own approximately 92 miles of such structures along the coastline. As a result of wave forces on the coastal structures and lowered beach elevations, the Commonwealth and local governments routinely invest millions of dollars to repair and reinforce these structures so they can adequately protect coastal communities. For example, in 2018 a seawall reconstruction project was completed in the Town of Marshfield to address coastal flooding and public safety issues. The Commonwealth provided a $1.85 million grant and loan award to the town, which was matched with roughly $620,000 in local funds. The approximately 600-foot section of seawall sustained damages during a coastal storm in January 2015, and the state-funded project increased the height of the seawall by two to three feet to better protect a public road, utilities, and homes. The Town of Marshfield has 32 coastal engineered structures along 12 miles of exposed shoreline, totaling over 20,000 feet (3.9 miles), that have been identified as needing repairs and retrofits to address the current and future threats of sea level rise and coastal storms. With higher flood

levels and greater storm surges, significantly more investments will be required to achieve the current flood-design protections afforded by these engineered structures across the coast.

22. The Commonwealth owns a substantial portion of the state's coastal property and infrastructure. The Commonwealth owns, operates, and maintains approximately 177 coastal state parks, beaches, reservations, and wildlife refuges located within the Massachusetts coastal zone. The Commonwealth also owns, operates, and maintains numerous properties, facilities, and infrastructure in the coastal zone, including roads, parkways, piers, and dams. Rising sea levels along the Massachusetts coast will result in either the permanent or temporary loss of the Commonwealth's coastal property through inundation, storm surge, flooding, and erosion events. These projected losses of coastal property will likely destroy or damage many of the state-owned facilities and infrastructure described above. The Commonwealth likely will be required to expend significant resources to protect, repair, rebuild, or possibly relocate the affected properties, facilities, and infrastructure. According to the Commonwealth's 2018 *State Hazard Mitigation and Climate Adaptation Plan*,[16] the replacement cost of state-owned facilities

[16] Available at: www.mass.gov/service-details/massachusetts-integrated-state-hazard-mitigation-and-climate-adaptation-plan.

exposed to FEMA's 1% annual chance flood event in coastal counties exceeds $500 million.

23. The Massachusetts coastal zone is home to several major ports including the Port of Boston and New Bedford/Fairhaven Harbor. Recent economic studies indicate the income generated from the Massachusetts maritime economy supports 2.6% of the state's direct employment and 1.3% of gross domestic product.[17] In 2018, New Bedford/Fairhaven Harbor alone generated $3.7 billion in direct business revenue from seafood processing and fleet operation businesses.[18] By nature of their purpose, the state's ports and harbors are generally low-lying, coastal-dependent areas of high density-built environment and are susceptible to service interruption and associated revenue loss when flooded or otherwise impacted by coastal events. Additionally, coastal dependent businesses, maritime schools, and public facilities and departments will face disruptions in service in post-storm conditions.

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[17] *See* DAVID R. BORGES ET AL., UMASS DARTMOUTH PUBLIC POLICY CTR., NAVIGATING THE GLOBAL ECONOMY: A COMPREHENSIVE ANALYSIS OF THE MASSACHUSETTS MARITIME ECONOMY 11 (2018), www.mass.gov/files/documents/2018/01/24/Maritime_Economy.pdf.

[18] MARTIN ASSOCIATES & FOTH-CLE ENG'G GROUP, ECONOMIC IMPACT STUDY OF THE NEW BEDFORD/FAIRHAVEN HARBOR 5 (2019), https://www.fairhaven-ma.gov/system/files/uploads/economic_impact_study_nbfh_harbor_2019-martin-report_0.pdf.

24. The Commonwealth is committed to protecting public safety, human health, the environment, and public resources through programs and policies that address sea level rise and other climate-change-related coastal hazards. EEA and CZM provide information, strategies, and tools to help other state agencies and communities plan for and address the challenges of erosion, flooding, storms, sea level rise, and other climate change impacts.

25. EEA and CZM climate grant programs have been able to address about half of the need requested by communities. Since 2014, CZM has awarded approximately $25 million (of $50 million requested) in state-funded grants to local communities and non-profit organizations to support sea level rise adaptation planning and implementation through the Coastal Resilience Grant Program. Local governments and non-profit organizations have matched these state funds with roughly $11 million in local funds and in-kind services. Since 2017, EEA has awarded over $65 million of $140 million requested in municipal grants for climate vulnerability planning and implementation statewide through the Municipal Vulnerability Preparedness (MVP) Program. Since the start of the MVP Program, local governments have matched MVP grants with over $29 million in local funds and staff time. EEA and CZM see a significant and growing need for support at the local level.

26. Municipalities, private entities, and other partners are also supporting planning and implementation of adaptation measures to address the impacts of sea level rise and other climate change impacts in Massachusetts. Adaptation planning efforts include vulnerability assessments to determine areas and infrastructure susceptible to coastal impacts, prioritization of vulnerable assets and areas, and development of adaptation alternatives to mitigate climate risks in the near and long term. One example is the City of Boston's "Climate Ready Boston" initiative, which has been developing district-level adaptation plans to address near-term coastal flooding and establish a framework for the funding and implementation of long-term, broader scale solutions. For the East Boston and Charlestown neighborhoods, the City of Boston identified near-term (2030–2050) and long-term (2050–2070) actions for addressing future flood risks created by sea level rise. The City of Boston's report estimates the costs for these actions range from $202 million to $342 million for East Boston and Charlestown alone.[19] More recently, the city completed a coastal resilience plan for the South Boston neighborhood and a similar plan for the Downtown area in 2020. An example of regional planning for

[19] *See* COASTAL RESILIENCE SOLUTIONS FOR EAST BOSTON AND CHARLESTOWN: FINAL REPORT (2017), https://www.boston.gov/sites/default/files/embed/c/climatereadyeastbostoncharlestown_finalreport_web.pdf.

the impacts of coastal climate change is the *Great Marsh Coastal Adaptation Plan* led by the National Wildlife Federation in partnership with the Ipswich River Watershed Association.[20] The plan assesses climate impacts and vulnerability for the Great Marsh region and each of its six communities (Salisbury, Newburyport, Newbury, Rowley, Ipswich, and Essex), examining the risk and exposure of critical infrastructure and natural resources, and identifies areas of special concern. The plan states that in Newburyport, estimated one-time damages to buildings and structures (not contents) from a 1% annual exceedance probability storm (also known as the 100-year storm) under 1.09 feet of sea level rise would be $18.3 million, and under 3.45 feet of sea level rise the damages would increase to $32.4 million.[21]

27. EPA's greenhouse gas emissions standards promulgated in the Final Action are anticipated to reduce greenhouse gas emissions by 3.1 billion tons.[22] These standards are more stringent than the greenhouse gas emissions standards previously in place. If the standards promulgated in the Final Action do not remain in effect, the projected emission reductions will not be realized.

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[20] *See* TAJ SCHOTTLAND ET AL., GREAT MARSH COASTAL ADAPTATION PLAN (2017), www.nwf.org/-/media/Documents/PDFs/NWF-Reports/NWF-Report_Great-Marsh-Coastal-Adaptation-Plan_2017.ashx.

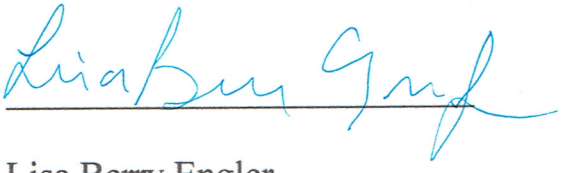
[21] *Id.* at 49, tbl.3.3-3.

[22] 86 Fed. Reg. at 74,348.

28. In conclusion, any increase in the rate of sea level rise and the frequency, magnitude, and severity of coastal flooding, erosion, and storms related to increases in greenhouse gas emissions due to the standards in the Final Rule not remaining in effect will adversely impact the Commonwealth and its residents and will require the Commonwealth to expend additional resources and incur additional costs.

I declare under penalty of perjury that the foregoing is true and correct.

Executed in Belmont, Massachusetts on March 4, 2022.



Lisa Berry Engler
Director
Massachusetts Office of Coastal Zone Management

DECLARATION OF ERICA FLEISHMAN

I, Erica Fleishman, declare as follows:

1. I serve as director of the Oregon Climate Change Research Institute (OCCRI), which is housed at the College of Earth, Ocean, and Atmospheric Sciences at Oregon State University.

2. I submit this declaration in support of the State Petitioners' standing to intervene in all challenges to the final action of the United States Environmental Protection Agency, "Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions Standards," published at 86 Fed. Reg. 74,434 (December 30, 2021) (Final Rule). I make this declaration on the basis of my own personal knowledge, unless otherwise indicated.

3. In the United States, automobiles are major contributors to emissions of greenhouse gases, especially carbon dioxide. The U.S. Environmental Protection Agency estimated that in 2019, the transportation sector contributed 29% of greenhouse emissions, 58% of which was produced by passenger cars and light-duty trucks and 24% of which was produced by freight trucks[1]. All else being equal, regulations that reduce emissions from automobiles would contribute to mitigating the effects of anthropogenic climate change discussed below.

PERSONAL BACKGROUND AND QUALIFICATIONS

4. I received a BS and MS in Biological Sciences from Stanford University in 1991 and 1992, respectively, and a PhD in Ecology, Evolution, and Conservation Biology from University of Nevada, Reno in 1997. I have 30 years of experience in assessing the effects of climate and other types of environmental variability, extremes, and change on natural and human-

[1] U.S. Environmental Protection Agency. 2021. Inventory of U.S. greenhouse gas emissions and sinks 1990–2019. EPA 430-R-21-005.

dominated ecosystems in the western United States. Since 2012 I have served as a co-principal investigator of the Southwest Climate Adaptation Science Center, one of eight such regional centers across the United States. These centers develop data and tools to address the climate change-related information needs of managers of species, ecosystems, and the human communities they support.

5. OCCRI was created in 2007 by the Oregon State Legislature under House Bill 3543. Among OCCRI's charges from the Legislature is "assess[ment of]… the state of climate change science, including biological, physical and social science, as it relates to Oregon and the likely effects of climate change on the state." The *Fifth Oregon Climate Assessment* (https://blogs.oregonstate.edu/occri/oregon-climate-assessments/), which was authored by OCCRI scientists and collaborators, was released in January 2021. OCCRI scientists also contributed to the Northwest chapter of the Fourth National Climate Assessment (https://nca2018.globalchange.gov/chapter/24/) and regularly support the Oregon Department of Land Conservation and Development in its production of state- and county-level natural hazard mitigation plans (e.g., https://blogs.oregonstate.edu/occri/projects/dlcd/). These and previous Oregon Climate Assessment reports, other publications in the peer-reviewed literature, and a limited amount of personal communication from agencies of the State of Oregon form the basis for this declaration.

6. I am making this declaration in my personal capacity on the basis of my expertise, experience, and training, and not on behalf of Oregon State University.

CLIMATE CHANGE IN OREGON AND ASSOCIATED RISKS

7. Global increases in concentrations of greenhouse gases are changing the climate in Oregon.

Not only are average values of annual temperature and, in some cases, precipitation and humidity changing; but the incidence of extreme temperature, precipitation, and other forms of extreme climate is increasing; and climate is becoming less predictable. Anthropogenic climate change also is contributing to sea-level rise. As sea level rises, coastal storms and high tides are likely to increase the frequency and severity of flooding along the Oregon coastline. For example, by the year 2050, relative sea level at Newport, Oregon, is highly likely to rise by 0.6–1.8 feet, and at least one flood is likely to exceed 4 feet above mean high tide. Many of the consequences of climate change also directly and indirectly threaten Oregon residents' physical and mental health and their economic and social well-being. Disasters may result not only from isolated events, but also from recurrent events that individually are not extreme, but degrade a community's infrastructure (Field et al. 2012[2]).

8. The Pacific Northwest has warmed by about 2˚F since 1900. Average temperatures in Oregon are projected to increase by another 5–8.2°F by the 2080s, depending on the global level of greenhouse gas emissions. Hot days and warm nights are likely to become more frequent as a result of anthropogenic climate change. Extreme heat poses risk to human health, especially among those who work or live outdoors, the elderly, those with underlying health conditions, and economically disadvantaged communities, and can stress local emergency healthcare systems. As noted below, there also is evidence that the incidence of some infectious diseases, such as Lyme disease, West Nile virus, and salmonella, increase as average temperatures increase or during heat waves.

[2] Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Medgley, editors. 2012. Managing the risks of extreme events and disasters to advance climate change adaptation. A special report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom.

9. Oregon's annual snowpack is decreasing as the proportion of precipitation falling as rain increases and snowmelt occurs earlier. For example, from 1982–2017, peak snow water equivalent on the east side of the central Cascade Range declined by more than 70%. Snowmelt trended earlier in all mountain regions of the state, with maximum regional changes of 16 days earlier per decade. As a result, autumn and winter runoff is projected to increase across Oregon, increasing the probability of seasonal flooding and landslides that can threaten human lives, private property, and infrastructure such as roads and other transportation corridors (see below). Additionally, the runoff associated with extreme precipitation may introduce human-made or naturally occurring toxins into the domestic water supply. Spring and summer runoff are likely to decrease, and vulnerability to water shortages to increase, in western and northeastern Oregon. For example, in the Columbia River basin, snowmelt runoff accounts for about 25% of total surface water allocated to irrigation (Qin et al. 2020[3]). Decreases in water availability may decrease the quality and quantity of water available for domestic consumption and use, including but not limited to drinking, cooking, washing, and bathing.

10. Projected changes in climate in both the short term and the long term contribute to changes in fire dynamics in Oregon and beyond. Across the United States, changes in fire dynamics are leading to losses of human life and property, and to substantial financial costs. Nationwide, the damages associated with wildfires in 2017 and 2018 were greater than $40 billion (Smith 2019[4]). Shifts in fire dynamics often reflect interactions among historic fire suppression; changes in vegetation structure and composition, including the introduction of

[3] Qin, Y., J.T. Abatzoglou, S. Siebert, L.S. Huning, A. AghaKouchak, J.S. Makin, C. Hong, D. Tong, S.J. Davis, and N.D. Mueller. 2020. Agricultural risks from changing snowmelt. Nature Climate Change 10:459–465.

[4] Smith, A.B. 2019. 2018's billion dollar disasters in context. https://www.climate.gov/news-features/blogs/beyond-data/2018s-billion-dollar-disasters-context, accessed December 2019.

non-native invasive grasses that are highly flammable (Brooks et al. 2004[5], Fusco et al. 2019[6]), the increasing role of humans in igniting wildfires (Balch et al. 2017[7]), and changes in climate and fire weather.

11. In the Pacific Northwest, the duration of the fire season more than quadrupled, from an average of 23 days to an average of 116 days, from the 1970s to the 2000s. Across the western United States, roughly half of the observed increase in fuel aridity and more than 16,000 square miles of burned area from 1984–2015 were attributed to human-caused climate change.

12. As climate, fuel loads, and associated fire dynamics change, the cost of fire suppression in Oregon is increasing. The average number of acres that burned in Oregon increased from 11,600 from 1990–1999 to 41,700 from 2010–2019 (GCWR 2019[8]). Prior to 2013, the Oregon Department of Forestry rarely required state General Fund dollars for fire suppression on lands under its jurisdiction. Since 2013, however, the Department has required General Fund support annually; the annual cost to the General Fund for suppressing large fires has been approximately $20 million.

[5] Brooks, M.L., C.M. D'Antonio, D.M. Richardson, J.B. Grace, J.E. Keeley, J.M. DiTomaso, R.J. Hobbs, M. Pellant, and D. Pyke. 2004. Effects of invasive alien plants on fire regimes. BioScience 54:677–688.

[6] Fusco, E.J., J.T. Finn, J.K. Balch, R.C. Nagy, and B.A. Bradley. 2019. Invasive grasses increase fire occurrence and frequency across US ecoregions. Proceedings of the National Academy of Sciences of the United States 116:23594–23599.

[7] Balch, J.K., B.A. Bradley, J.T. Abatzoglou, R.C. Nagy, E.J. Fusco, and A.L. Mahood. 2017. Human-started wildfires expand the fire niche across the United States. Proceedings of the National Academy of Sciences of the United States 114:2946–2951.

[8] [Oregon] Governor's Council on Wildfire Response (GCWR), Report and Recommendations, November 2019. https://www.oregon.gov/gov/policy/Documents/FullWFCReport_2019.pdf.

13. The State of Oregon owns forests in which the frequency and size of wildfires is likely to increase. The Oregon Department of Forestry noted that wildfires in the Santiam State Forest during September 2020, which burned over 16,000 acres, not only had ecological effects but also damaged recreation sites and roads[9]. The area burned in Oregon during 2020 (approximately 1.2 million acres) was among the largest in the reliable historic record.

14. Oregon incurs diverse costs from wildfires. The estimated cost to the state of completed and projected cleanup efforts in the wake of the September 2020 fires, including removal of ash, debris, hazardous materials, and trees that threatened to impede the roadway, is $75.63 million from the State Highway Fund and $75.75 million from the State General Fund[10]. These direct costs to the State will not be reimbursed by the Federal Emergency Management Agency.

15. The human costs of wildfires are considerable, and also result in costs to the state. For example, high levels of fine particulate matter are associated with respiratory illness in humans and other animals, especially in individuals with compromised respiratory systems, and with reductions in outdoor exercise (Evans 2019[11]). To illustrate, on a peak smoke day during the 2017 Eagle Creek fire, the Oregon Health Authority reported a 20% increase in emergency room visits for respiratory symptoms in the Portland metropolitan region (OHA 2017[12]). Short-term exposure to fine particulate matter from smoke also has been linked to

[9] https://www.oregon.gov/odf/recreation/Pages/santiam-state-forest.aspx
[10] F. Reading, Oregon Debris Management Task Force, Oregon Department of Transportation, personal communication, 16 December 2021.
[11] Evans, G.W. 2019. Projected behavioral impacts of global climate change. Annual Review of Psychology 70:449–474.
[12] Oregon Health Authority (OHA). 2017. Statewide fire activation surveillance report (090517-090617).

increases in violent crime, especially assaults (Burkhardt et al. 2019[13]). The number of days on which the air quality index (AQI) was poor for all groups (AQI categories unhealthy, very unhealthy, or hazardous) in many Oregon municipalities as a result of wildfire smoke increased considerably in recent years (DEQ 2018)[14]. For example, the AQI in Medford was poor due to wildfire smoke for a total of 28 days from 1985–2014, primarily in 1987 (16 days). By contrast, from 2015–2018, Medford's AQI was poor due to wildfire smoke for a total of 46 days: 7 in 2015, 14 in 2017, and 25 in 2018. Portland's AQI was not affected by wildfire smoke from 1985–2014, but smoke resulted in a poor AQI in the city on five days from 2015–2018. Similarly, during extreme wildfires in September 2020, the AQI in Portland, Oregon, reached levels higher (indicating high risks to human health) than those in any other major city worldwide (IQAir 2020)[15]. The AQI in Portland was considered hazardous for three consecutive days, and unhealthy for seven consecutive days (IQAIR 2020)[11]. During that period, levels of fine particulate matter in smaller cities in Oregon, such as Applegate Valley and Cave Junction, sometimes exceeded those in Portland (AirNow 2020)[16]. Moreover, smoke-driven reductions in air quality in Oregon are affecting regional economies. For example, *The New York Times* reported that in 2018, the Oregon Shakespeare Festival in Ashland estimated losses of $2 million as a result of cancelled performances and reduced attendance due to wildfire smoke[17].

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[13] Burkhardt, J., J. Bayham, A. Wilson, J. Berman, K. O'Dell, B. Ford, E.V. Fischer, and J.R. Pierce. 2019. The relationship between air pollution and violent crime across the United States. Journal of Environmental Economics and Policy. https://doi.org/10.1080/21606544.2019.1630014.

[14] State of Oregon Department of Environmental Quality (DEQ). 2018. Wildfire smoke trends and associated health risks, Bend, Klamath Falls, Medford and Portland – 1985 to 2018. https://www.oregon.gov/deq/FilterDocs/smoketrends.pdf, accessed March 2019.

[15] https://www.iqair.com/us/blog/wildfires/washington-oregon-fires-choke-northwest

[16] https://www.airnow.gov/state/?name=oregon

[17] The New York Times. 24 August 2018. Wildfire smoke disrupts Oregon Shakespeare Festival. https://www.nytimes.com/2018/08/24/theater/oregon-shakespeare-festival-wildfire-smoke.html

16. The Oregon Health Authority (OHA), drawing on data on air quality, emergency department visits, and hospitalizations in areas affected by wildfire smoke, can estimate certain health care costs for diseases and conditions known to be caused or exacerbated by exposure to particulate matter.

17. The OHA estimates that smoke from the Chetco Bar Fire and other wildfires that affected central and southwestern Oregon (1.1 million residents) during two months in late summer 2017 resulted in 207 excess emergency department visits and 18 excess hospitalizations for asthma, at a cost of $556,000.

18. The OHA estimates that smoke from the 2017 Eagle Creek Fire in the Columbia River Gorge (2 million residents in seven counties) resulted in 96 excess emergency department visits and 9 excess hospitalizations for asthma, at a cost of $529,000.

19. Climate change, including the effects of wildfires that are driven in part by climate change, is expected to have continuing negative effects on the health of Oregonians. The cost of those negative effects, in turn, will increase burdens on the state's budget. The OHA, relying primarily on the Oregon All Payer Claims Database, estimates that about 13% of all Oregon health care costs are borne by the state. In addition to the health effects of wildfire smoke and extreme heat, climate change may increase Oregonians' exposure to vector-borne diseases. For example, above-average temperatures were associated with expansion of West Nile virus from the eastern to the western United States (Reisen et al. 2006[18]). As summer becomes longer and warmer, the incidence of West Nile virus, and other viral

[18] Reisen, W.K., Y. Fang, and V.M. Martinez. 2006. Effects of temperature on the transmission of West Nile virus by *Culex tarsalis* (Diptera: Culicidae). Journal of Medical Entomology 43:309–317.

infections that cause brain inflammation, may increase (Bethel et al. 2013[19]). Additionally, as water temperatures in oceans and estuaries in the Northwest increase, so may the incidence of *Vibrio parahaemolyticus* infections, which are caused by consuming raw oysters or other shellfish that are infected with the bacterium (Bethel et al. 2013[12]). Exposure to and incidence of other water-borne diseases, especially cryptosporidosis, may increase as precipitation and flooding in Oregon increase (Bethel et al. 2013[12]). High flows can carry cattle feces into recreational waters and sources of drinking water, resulting in cryptosporidosis and other gastrointestinal illnesses in humans.

20. Climate change is likely to reduce many populations' access to sufficient and nutritious food[12], which in turn poses risks to physical and mental health, maternal health, and child development (Schnitter and Berry 2019[20]). Mechanisms by which food security may be affected include droughts and floods within or beyond the region; both can affect agricultural production, and floods and landslides can affect the infrastructure used to transport food. Individuals, populations, and communities that have low incomes, are relatively isolated, or are in poor health may be especially vulnerable to climate change-induced food insecurity. Given the role that certain foods play in tribal communities, not only health but cultural values and identity are threatened by some elements of climate change and related food access (Quaempts et al. 2018[21]).

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[19] Bethel, J., S. Ranzoni, and S.M. Capalbo. 2013. Human health: impacts and adaptation. Pages 181 – 206 in Dalton, M., P.W. Mote, and A.K. Snover. 2013. Climate change in the Northwest: implications for our landscapes, waters, and communities. Island Press, Washington, D.C.

[20] Schnitter, R., and P. Berry. 2019. The climate change, food security, and human health nexus in Canada: a framework to protect population health. International Journal of Environmental Research and Public Health 16:2531. doi:10.3390/ijerph16142531.

[21] Quaempts, E.J., K.L. Jones, S.J. O'Daniel, T.J. Beechie, and G.C. Poole. 2018. Aligning environmental management with ecosystem resilience: a First Foods example from the Confederated Tribes of the Umatilla Indian Reservation, Oregon, USA. Ecology and Society 23(2):29. doi:10.5751/ES-10080-23029.

17. Mental health also is likely to be adversely affected by climate change. For example, extreme events that are caused in part by climate change, such as wildfires or floods, can displace people from their homes either temporarily or permanently and degrade social and economic infrastructure (Bethel et al. 2013[12]). Similar effects on social and economic systems may result from recurrent events even if the individual events are not extreme (Field et al. 2012[22]). Heat waves have been associated with increases in violent criminal activity during the following week in jurisdictions across the United States (Jacob et al. 2007[23]), and increases in larceny and violent crime are projected to increase as maximum monthly temperatures increase (Ranson 2014[24]).

19. Rising sea levels, increases in ocean temperature, coastal erosion, ocean acidification, and an increase in the frequency of harmful algal blooms will continue to threaten private property and subsistence, recreational, and commercial fisheries, including but not limited to shellfish fisheries, along the Pacific Coast of the United States. For example, because warm water holds less oxygen than cold water, increases in water temperature directly reduce the concentration of dissolved oxygen. The number of Dungeness crabs (*Metacarcinus magister*) caught per person-hour of fishing, and the general condition of those crabs, decreases as oxygen concentrations off the coast of west-central Oregon decrease (Keller et al. 2010[25]). Additionally, in 2016, high concentrations of domoic acid

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[22] Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Medgley, editors. 2012. Managing the risks of extreme events and disasters to advance climate change adaptation. A special report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom.

[23] Jacob, B., L. Lefgren, and E. Moretti. 2007. The dynamics of criminal behavior: evidence from weather shocks. Journal of Human Resources 42:489–527.

[24] Ranson, M. 2014. Crime, weather, and climate change. Journal of Environmental Economics and Management 67:274–302.

[25] Keller, A, V. Simon, F. Chan, W.W. Wakefield, M.E. Clarke, D. Kamikawa, E.L. Frush, and J.A. Barth. 2010. Demersal fish and invertebrate biomass in relation to an offshore hypoxic zone along the U.S. West Coast. Fisheries Oceanography 19:76–87.

from a regional harmful algal bloom led to a prolonged delay in the opening of the West Coast Dungeness crab fishery. Sea level rise could drive saltwater intrusion into coastal aquifers from which water for domestic and agricultural uses is derived. Additionally, extreme winter storms increase storm surge, erosion, and the likelihood of flooding in coastal communities.

20. Transportation systems in Oregon are threatened by extreme precipitation and temperatures, sea level rise, and wildfires, all of which can damage roads to the point that closures are necessary (OLIS 2019[26]). Current levels of funding are not sufficient for the Oregon Department of Transportation to proactively clear drainages (reducing the risk of flood), reshape slopes (reducing the risk of landslides), and maintain roadside vegetation (reducing the risk of flood and ignition or expansion of wildfire) (OLIS 2019).

21. Climate change is likely to have negative effects on transportation infrastructure absent substantial new investments. An assessment conducted by the Oregon Department of Transportation, Federal Highway Administration, and local government authorities in 2014 (ODOT 2014[27]) identified vulnerabilities to climate change and extreme weather on highways in the Coast Range, roads in low-elevation areas that increasingly are prone to flooding, and the transportation infrastructure in coastal areas that are exposed to storm surges and inundation, both of which are becoming more frequent as anthropogenic climate change continues. Seismic Lifeline Routes in Oregon, intended to facilitate emergency response and recovery after an earthquake, also were found to be vulnerable. Furthermore,

[26] Oregon State Legislature, Oregon Legislative Information (OLIS). 2019. An adaptation menu of investment options: potential transportation investments to adapt to climate change impacts. Committee meeting document. https://olis.leg.state.or.us/liz/2019R1/Downloads/CommitteeMeetingDocument/165202.

[27] Oregon Department of Transportation (ODOT). 2014. Climate change vulnerability assessment and adaptation options study. www.oregon.gov/ODOT/Programs/TDD%20Documents/ Climate-Change-Vulnerability-Assessment-Adaptation-Options-Study.pdf.

incremental increases in relative sea-level rise can produce exponential increases in flood frequency (Taherkhani et al. 2020[28]). For example, on the west coast of the United States, a rise in sea level of about 2.1 inches doubles the likelihood of exceeding the contemporary 50-year flood (a flood that has a 2% probability of occurring in a given year) (Taherkhani et al. 2020). Global mean sea level has risen by about 7–8 inches since 1900, and rates of sea level rise have accelerated over the past 25 years (Nerem et al. 2018[29]). Global mean sea level is likely to continue to rise by about 1–4 feet, relative to the year 2000, by the year 2100 (Sweet et al. 2017[30]). Sea level rise projections vary along the Oregon coast, primarily due to local differences in vertical land motions. To illustrate, median local sea level projections for Astoria, near Fort Stevens State Park, range from 0.1–2.4 feet above a 1992 baseline by 2050, depending on the emissions scenario. By contrast, median local sea level projections for Newport, near South Beach State Park and Lost Creek State Recreation Site, range from 0.6–2.9 feet above a 1992 baseline by 2050.

21. Native American tribes both on and off reservations generally are among the communities most strongly and adversely affected by climate change. Climate change affects the lands, identity, economies, physical and mental health, and culture of Native American tribes in addition to tribal fisheries and other sources of traditional foods, including but not limited to salmon, shellfish, and berries. In 2015, 15 tribes in the Columbia River Basin and three

[28] Taherkhani, M., S. Vitousek, P.L. Barnard, N. Frazer, T.R. Anderson, and C.H. Fletcher. 2020. Sea-level rise exponentially increases coastal flood frequency. Scientific Reports 10:6466. doi: 10.1038/s41598-020-62188-4.

[29] Nerem, R., B. Beckley, J. Fasullo, B. Hamlington, D. Masters, and G. Mitchum. 2018. Climate change-driven accelerated sea-level rise detected in the altimeter era. Proceedings of the National Academy of Sciences 115:2022–2025.

[30] Sweet, W.V., R. Horton, R.E. Kopp, A.N. LeGrande, and A. Romanou, 2017. Sea level rise. Pages 333–363 in D.J. Wuebbles, D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock, editors. Climate science special report: fourth National Climate Assessment, volume I. U.S. Global Change Research Program, Washington, D.C. https://science2017.globalchange.gov/.

intertribal organizations identified protection of water quality and quantity; fishes, their habitats, and connectivity among them; preparation for wildfires in forests; and wildlife and their habitat among their highest priorities for climate action plans (Sampson 2015[31]).

I state under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge and belief.

Executed in Corvallis, Oregon on December 30, 2021

Erica Fleishman

Director, Oregon Climate Change Research Institute

[31] Sampson, D. 2015. Columbia River Basin tribes climate change capacity assessment. Portland State University, Portland, Oregon. https://www.tribalclimatecamp.org/sites/default/files/ColBasinTribes_CCCassessment.pdf

DECLARATION OF MARK HAMMOND

I, Mark Hammond, pursuant to 28 U.S.C. § 1746, declare as follows:

Overview

1. I am the Director of the Bureau of Air Quality of the Pennsylvania Department of Environmental Protection ("PADEP"), an executive branch agency of the Commonwealth of Pennsylvania government.

2. I submit this declaration on behalf of the Commonwealth of Pennsylvania ("Commonwealth") as a State intervenor in the matter involving the Petitioners' challenge of the U.S. Environmental Protection Agency's ("EPA") final rulemaking action entitled "Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions Standards." ("GHG Standards Rule").

3. Unless otherwise noted, the statements made in this declaration are based on my review of various publicly available records, reports, statements, and data compilations prepared by public agencies of the federal government and/or the Commonwealth. I have also reviewed the

GHG Standards Rule[1] that is subject to Petitioner's challenge in this litigation.

Biography

4. I received my Bachelor of Science degree in 1991 from Virginia Polytechnical Institute and State University with a major in Mechanical Engineering and obtained my Juris Doctorate from the University of Pittsburgh School of Law in 1994.

5. I became the Director of the BAQ on August 3, 2020. My current responsibilities include safeguarding the health of Pennsylvanians by achieving the goals of the federal Clean Air Act, 42 U.S.C. §§ 7401-7671q, and the Pennsylvania Air Pollution Control Act, 35 P.S. §§ 4001-4015. I manage the BAQ's goals, objectives, and policies and oversee all its regulatory programs which include air quality monitoring, air resource management and planning, compliance and enforcement, permitting, and source testing and monitoring.

[1] The Commonwealth participated in a September 27, 2021 multi-state comment letter in support of EPA's proposed rulemaking to revise GHG emissions standards for MYs 2023—2026 light-duty vehicles to be more stringent than the weakened standards for those MYs in "SAFE 2" (85 Fed. Reg. 24,174 (Apr. 30, 2020)). See, 86 Fed. Reg. 22,421 (Apr. 28, 2021)); Docket ID No. EPA–HQ–OAR–2021–0208.

6. From 2010 to August 2020, I served on the Commonwealth's Climate Change Advisory Committee ("CCAC") created under the Pennsylvania Climate Change Act, 71 P.S. §§ 1361.1 *et seq*. I served as the Chairman of CCAC from September 2018 to August 2020 and as Vice Chair of CCAC from 2012 to 2016. My role involved providing advice to PADEP regarding the implementation of the Pennsylvania Climate Change Act, including the development and submission of a Climate Change Action Plan to the Governor.

7. Starting in June 2011, I served as an attorney for Land Air Water Legal Solutions, LLC in Pennsylvania and became President of this firm in October 2011. During this time, I counseled clients on regulatory compliance strategies, implementation and reporting matters pertaining to the Clean Air Act and Air Pollution Control Act and implementing regulations thereunder. This work included permitting, emission inventories, ambient air modeling and monitoring and risk assessments. I held this role with Land Air Water Legal Solutions, LLC until my departure on December 31, 2019.

8. From 2002 to 2011, in my previous position as an Associate with Drinker Biddle & Reath, LLP, I counseled clients on Clean Air Act

matters affecting manufacturers and the energy industry, including NESHAP, operating permit and regulatory compliance strategies.

9. From 1995 to 2001, in my position as an Executive Team Leader at Compliance Management International, I managed the environmental consulting staff (from 1995-1998) and the technical staff (from 1998-2001). In this role, I assisted clients in all aspects of environmental compliance, including air, waste, water, energy efficiency and pollution prevention.

EPA's GHG Standards Rule Will Reduce Air Pollution from Light-Duty Vehicles in Pennsylvania

10. The EPA's GHG Standards Rule revises the greenhouse gas ("GHG") emissions standards under section 202(a) of the Clean Air Act ("CAA") (42 U.S.C. § 7521(a)) to be more stringent for each of the 2023—2026 model years ("MYs") than the GHG standards previously established in the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule (85 Fed. Reg. 24,174; (Apr. 30, 2020)).

11. Based upon my review and analysis, the EPA's GHG Standards Rule will benefit Pennsylvania by reducing emissions of GHGs into the atmosphere from MYs 2023—2026 light-duty motor vehicles delivered for sale and operated in Pennsylvania and neighboring states. Pursuant to

its authority under the Air Pollution Control Act (35 P.S. §§ 4001—4015), Pennsylvania previously adopted and incorporated the California Air Resources Board's ("CARB") GHG vehicle emission standards at Title 25, Chapter 126, Subch. D, including CARB's GHG emissions standards under section 177 of the Clean Air Act (42 U.S.C. § 7507). See, 25 Pa. Code § 126.411(b); see also, 36 Pa. Bull. 7424, 7426 and 7432; December 8, 2006. Through the EPA's more stringent GHG emission standards, Pennsylvania will experience less adverse impacts from air pollution as a result of cleaner vehicles being delivered for sale and operated throughout the Commonwealth and other neighboring states.

12. In the EPA's GHG Standards Rule, the EPA finalized the proposed standards for MYs 2023 and 2024; finalized standards more stringent than the proposed standards for MYs 2025 and 2026. These more stringent standards will result in a projected reduction of 3.1 billion tons of GHG emissions by 2050 according to EPA.[2]

13. Under the previous SAFE 2 final rule, the EPA and NHTSA projected that the rollback of GHG standards would result in increases of 867 million metric tons (over the vehicles lifetimes), increases in criteria

[2] See, Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions Standards – Final Rule (December 20, 2021) (epa.gov) at p. 14.

pollutants, and resulting increases in adverse health effects (as well as net costs to public welfare).[3]

14. The EPA's GHG Standards Rule acknowledges the effects of climate change by citing to the 2009 Endangerment Finding under section 202(a) of the Clean Air Act, which in part, provides that "[c]limate change is also expected to cause more intense hurricanes and more frequent and intense storms of other types and heavy precipitation, with impacts on other areas of public health, such as the potential for increased deaths, injuries, infectious and waterborne diseases, and stress-related disorders."[4]

15. A court ruling invalidating these GHG standards would hinder the Commonwealth's ability to benefit from reductions of GHG emissions and other air pollution from light-duty vehicles in the Commonwealth through the Department's administration of the PCVP.

16. Due to the need to address climate change as evidenced by the acceleration of global warming and the need to accelerate the reduction of GHG emissions, the implementation of more stringent GHG standards as set forth in the GHG Standards Rule is important to the PADEP's strategy to reduce air pollution in Pennsylvania.

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[3] *Id.* at p. 12 citing 85 Fed. Reg. 25,111 (April 30, 2021).
[4] *Id.* at p. 174.

Impacts on Pennsylvania from Increased GHG Emissions

17. The Commonwealth faces two fundamental threats related to climate change: (1) sea level rise and its impact on communities and cities in the Delaware River Basin, including the City of Philadelphia; and (2) more frequent extreme storm weather events, including large storms, periods of drought, heat waves, heavier snowfalls, and an increase in overall precipitation variability affecting all areas throughout the Commonwealth.

18. Based on studies commissioned by PADEP, as part of its mandate under the Pennsylvania Climate Change Act, Pennsylvania has undergone a long-term warming of more than 1 degree Celsius over the past 110 years.[5]

19. The models used in the May 2015 Pennsylvania Climate Impacts Assessment Update, which remain largely the same as of the April 2020 Update, suggest this warming is a result of anthropogenic influence, and that this trend is accelerating. Projections in the 2015 Update show that

[5] Pennsylvania Dep't of Envt'l Prot., "Pennsylvania Climate Impacts Assessment Update," April 2020, p. 6, available at: http://files.dep.state.pa.us/Energy/Office%20of%20Energy%20and%20Technology/OETDPortalFiles/ClimateChange/2020ClimateChangeImpactsAssessmentUpdate.pdf.

by the middle of the 21st Century, Pennsylvania will be about 3 degrees Celsius warmer than it was at the end of the 20th century.[6]

20. As documented in the Updated Impacts Assessments, these warming trends will threaten Pennsylvania in a number of ways.

a. The public health of Pennsylvanians is threatened because climate change will worsen air quality relative to what it would otherwise have been, causing increased respiratory and cardiac illness. Respiratory complications such as asthma acutely and disproportionately affect the elderly and young children. The linkage between climate change and air quality is most strongly established for ground-level ozone creation during summer, but there is some evidence that higher temperatures and higher precipitation will result in increased allergen (pollen and mold) levels as well.

b. Pennsylvania agriculture will have to adapt to greater extremes in temperature and precipitation. Pennsylvania dairy production is likely to be negatively affected by climate change due to losses in milk

[6] Pennsylvania Dep't of Envt'l Prot., "Pennsylvania Climate Impacts Assessment Update," May 2015, pp. 44 and 101, available at: http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=5002&DocName=2015%20PENNSYLVANIA%20CLIMATE%20IMPACTS%20ASSESSMENT%20UPDATE.PDF%20#

yields caused by heat stress, additional expenditures to mitigate that heat stress, and lower levels of forage quality.

c. Pennsylvania's forests and orchards will be subject to multiple stressors. The warming climate will cause tree species' decreasingly suitable habitat to become stressed. Mortality rates are likely to increase and regeneration success is expected to decline for these tree species, resulting in declining importance of those species in the state.

d. Suitable habitat for plant and wildlife species is expected to shift to higher latitudes and elevations. This will reduce the amount of suitable habitat in Pennsylvania for species that are at the southern extent of their range in Pennsylvania or that are found primarily at high latitudes; the amount of habitat in the state that is suitable for species that are at the northern extent of their range in Pennsylvania will increase. The Canada lynx, which is already rare in Pennsylvania, will likely be extirpated from the state.

e. West Nile disease is endemic in Pennsylvania. It is currently most prevalent in Southeastern and Central parts of the state, and less prevalent in the Laurel Highlands and the Allegheny Plateau. However, climate change is expected to increase the prevalence of West Nile disease in the higher-elevation areas, due to higher

temperatures. In addition to its range, the duration of the transmission season for West Nile disease is sensitive to climate. Warmer temperatures result in a longer transmission season, and therefore greater infection risk.

f. Climate change poses a threat to the fauna of the tidal freshwater portion of the Delaware estuary in Pennsylvania. One reason is that increased water temperatures with climate change decrease the solubility of oxygen in water and will increase respiration rates, both of which will result in declines in dissolved oxygen concentration. Thus, climate change will worsen the currently substandard water quality in the tidal freshwater region of the Delaware Estuary. The salt intrusion associated with the combination of sea-level rise and summertime streamflow declines associated with climate change poses a threat to the City of Philadelphia's drinking water as the saltwater line extends further north on the Delaware River.

g. The freshwater tidal wetlands along Pennsylvania's southeastern coast are a rare, diverse, and ecologically important resource. Climate change poses a threat to these wetlands because of salinity intrusion and sea-level rise. Sea-level rise, however, has the potential to drown wetlands if their accretion rates are less than rates of sea-level rise.

h. Climate change has damaged state-owned and state-regulated infrastructure in Pennsylvania and continues to pose a continued risk to further damage roads, bridges, dams and other critical state-owned and state-regulated infrastructure due to more frequent and extreme storm events, which causes flooding and other adverse effects.

Costs to Commonwealth Government

21. Weaker GHG standards will result in increased GHG emissions in Pennsylvania, and therefore, will place the burden of additional costs onto the Commonwealth.

22. Climate change impacts have co-related costs which will be experienced in all the above-referenced areas.

23. One such cost through increased climate change impacts will be the increase in medical costs that are borne in large part by the Commonwealth through its Medicaid and Childhood Health Insurance Programs. One of the medical cost impacts will be an increase in asthma cases and episodes, and thus, asthma-related expenditures. Asthma places a significant economic burden on the United States, with a total cost of asthma including costs of missed work and school and mortality of $81.9 billion in 2013. Approximately 2,480,000 Pennsylvanians are on Medicaid and CHIP; these

programs bear a large part of the asthma-related costs in the Commonwealth, with for example, Medicaid alone bearing 37% of asthma related hospitalization costs.[7]

24. Another such cost to the Commonwealth will be the increase in costs associated with damages to infrastructure owned and maintained by the Commonwealth resulting from more frequent extreme storm events associated with climate change. In 2018 alone, climate-related costs to the Commonwealth totaled at least $261 million dollars, which included $125.7 million in in infrastructure damages as a result of flooding and landslides.[8] From April 2011 through September 2018, there was approximately $212 million in costs to the Commonwealth as result of damages to state-maintained roads and bridges from flooding and landslide events.[9] Weaker

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[7] U.S. Dep't of Health and Human Services, Medicaid.gov, August 2020 Medicaid & CHIP Enrollment Data Highlights, available at: https://www.medicaid.gov/medicaid/program-information/medicaid-and-chip-enrollment-data/report-highlights/index.html; *See* Pennsylvania Dep't of Health, 2012 Pennsylvania Asthma Burden Report, p. 37, available at: http://www.paasthma.org/images/docs/2012_asthma_burden_report.pdf

[8] Pennsylvania Auditor General Eugene A. DePasquale, Climate Crisis Special Report: The Rising Cost of Inaction, pp. 1 available at: https://www.paauditor.gov/Media/Default/Reports/RPT_Climate_crisis_111219_FINAL.pdf; *See* Pennsylvania Dep't of Envt'l Prot., "Climate Change in PA," available at: https://www.depgis.state.pa.us/ClimateChange/index.html

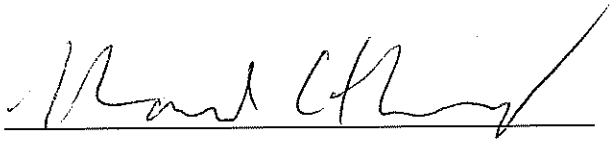
[9] Pennsylvania Dep't of Transportation, PennDOT Flooding/Slide Damages- April 2011 to September 2018, available at: https://www.penndot.gov/PennDOTWay/Pages/Article.aspx?post=165

GHG emission standards will contribute to increasing these costs for the Commonwealth in the future.

Conclusion

25. In sum, the EPA's GHG Standards Rule will benefit the Commonwealth by reducing emissions of GHGs from light-duty vehicles through more stringent GHG emission standards. A court ruling that would result in weakened or less stringent GHG emissions standards would lead to additional costs associated with increased emissions and poorer air quality as well as undermine the Commonwealth's air quality planning and implementation efforts.

I declare under penalty of perjury that the foregoing is true and correct.



Mark Hammond

December 22, 2021

Date