

IN THE SUPREME COURT OF PENNSYLVANIA  
MIDDLE DISTRICT

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111 MAP 2023

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CITIZENS FOR PENNSYLVANIA'S FUTURE, CLEAN AIR COUNCIL, THE  
SIERRA CLUB AND ITS PA CHAPTER, AND THE ENVIRONMENTAL  
DEFENSE FUND  
Intervenor-Appellants

v.

BOWFIN KEYCON HOLDINGS, LLC, ET AL.,  
Appellees

v.

PENNSYLVANIA DEPT. OF ENVTL. PROT., ET AL.,  
Appellees

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BRIEF OF *AMICUS CURIAE* DAMASCUS CITIZENS FOR  
SUSTAINABILITY IN SUPPORT OF INTERVENOR-APPELLANTS

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Appeal of the November 1, 2023 Order of the Commonwealth Court  
at 247 M.D. 2022

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## STATEMENT OF INTEREST OF AMICUS CURIAE

*Amicus curiae* Damascus Citizens for Sustainability, Inc. (“DCS”) is a 501(c)(3) non-profit, grassroots organization established in 2008 to, *inter alia*, protect the Delaware River Basin and watershed from the risks associated with oil and natural gas exploration, production, processing and transportation and to promote the health and prosperity of Delaware River Basin communities. DCS is also dedicated to protecting clean air, land, and water, including in non-Basin communities, from pollution caused by fossil fuel extraction and use.

To this end, DCS routinely provides individuals in Pennsylvania, across the country, and internationally, with information about how fossil fuels are extracted, processed, transported, and used; the risks those processes pose to human health and the environment; and federal, state, and local laws, regulations, and policies that govern fossil fuel extraction and related processes.

Since its inception, DCS has worked to understand the impacts and hidden costs of, and to push for better regulation and oversight of, oil and natural gas extraction, production, and transportation. This includes addressing the industry’s contributions to human-driven climate change.

The issues in this appeal regarding the validity and constitutionality of

Pennsylvania's Regional Greenhouse Gas Initiative ("RGGI") regulations directly affect DCS's decade and a half of work to prevent and remedy damage from fossil fuel industry activities. The Commonwealth Court's invalidation of the RGGI regulations also risks significantly hindering Pennsylvania's executive branch authority to act in accordance with scientific and public health data and the dictates of Article I, Section 27 of the Pennsylvania Constitution (the Environmental Rights Amendment). In this brief, DCS also seeks to provide a brief background on the economic principles of emissions trading frameworks like RGGI, which DCS's counsel has previously studied.

DCS declares that no person or entity other than DCS, its members, and/or counsel paid for and/or authored this brief.

## SUMMARY OF ARGUMENT

The Commonwealth Court's decision misclassifies RGGI as a tax. RGGI is not a tax, and it is not a traditional license fee. RGGI pertains to, *inter alia*, payments for the private use and occupation of a valuable, constitutionally-protected trust resource (the air/atmosphere) under Article I, Section 27 of the Pennsylvania Constitution ("Section 27") – a trust resource that is presently severely degraded and threatens the wellbeing of present and future generations of Pennsylvanians. RGGI is most similar to: (1) programs like submerged lands licenses, which require prepayment to occupy public trust resources (i.e. streambeds of navigable waterways, whereas RGGI requires prepayment to occupy the atmosphere with carbon dioxide); and (2) natural resources damages frameworks, except that here, RGGI requires companies to pay for their degradation of a trust resource *in advance*, instead of *afterward*, and uses those funds to further ameliorate the degraded trust resource (the air/atmosphere). Consistent with this Court's prior decisions, Section 27 limits how Pennsylvania may use RGGI auction allowance proceeds; however, because no concrete plan exists yet for the expenditure of RGGI auction allowance proceeds, detailed discussion is premature.

If the Commonwealth Court's decision stands, it will interfere with

Pennsylvania executive agencies' ability to fulfill their obligations under Section 27 and undercut this Court's decisions interpreting Section 27, particularly decisions addressing use of trust resources and funds from leases or programs governing private occupation of trust resources.

The decision below harmfully narrows executive agencies' ability, if not their constitutional obligation, to use their statutory authority to require companies to pay for private use of public natural resources protected by the Section 27 trust. Such a result also threatens existing programs such as submerged lands licenses and streambed oil and gas leases. The decision below will block or otherwise interfere with the statutory authority of the Pennsylvania Department of Environmental Protection ("PADEP"), or any entity of the executive branch, to require companies to pay for the social cost of their pollution and to direct that money toward ensuring that such private pollutional costs do not degrade trust resources and harm Section 27 trust beneficiaries. The decision below will stymie agencies' development of innovative ways to address emerging environmental degradation, or new knowledge about such degradation – something that remains very needed, particularly given the heavy and continued burden on Pennsylvania's environment from the energy sector and related operations, including to present and future generations of Pennsylvanians.



## ARGUMENT

RGGI requires fossil-fuel-powered electricity generating units (“EGUs”) to pay for their private use (pollution) of a public natural resource (air, the atmosphere) protected under the Section 27 trust – a trust resource that is scientifically shown to be degraded to such an extent that present and future generations<sup>1</sup> of Pennsylvanians may lose not only their right to benefit from Pennsylvania’s wealth of public natural resources, but also their health and livelihoods. 52 Pa. Bull. 2471, 2472-75 (Apr. 23, 2022). In economics terminology, RGGI requires that these companies pay for the social cost of their emissions that, otherwise, would be externalized onto Pennsylvanians, as has been done for well over a century.

The auction allowance proceeds must be used for Section 27 trust purposes because of their inherent connection to the usage of a public natural resource, Pa. Env'tl. Def. Found. v. Com. (“PEDF II”), 255 A.3d 289, 314 (Pa. 2021); see also Pa. Env'tl. Def. Found. (“PEDF I”), 161 A.3d 911, 933-36 (Pa. 2017); however, in-depth discussion of the usage of auction allowance proceeds is not yet ripe because PADEP and the EQB did not, in

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<sup>1</sup> Present generations are already affected, as can be seen by increased occurrences and duration of extreme rainfall events and droughts, as some examples. However, the most dire consequences will be to generations yet to come if we continue to fail to act with haste and purpose to lower greenhouse gas emissions.

the challenged rulemaking/regulations, establish how the proceeds were going to be used. 52 Pa. Bull. at 2507.

Nonetheless, the Commonwealth Court below and the regulation challengers relied on such non-final allocations to claim that RGGI is an unconstitutional tax because, allegedly, the auction allowance proceeds exceed program administration costs. The Commonwealth Court's decision, and the challengers' arguments, fail to address how RGGI – a cap-and-trade emissions framework – is neither a tax nor a traditional license fee. They further ignore the constitutional dimensions tied up with RGGI's operation and what the auction allowance proceeds actually represent, that is, advance compensation for natural resource damages to a constitutionally-protected public trust resource. The decision below likewise is contrary to the economic principles that underpin emissions markets – principles that ultimately dovetail with Section 27's requirements, particularly those of the Section 27 trust.

I. RGGI Requires That Companies Pay for Their Private Use (Degradation/Pollution) of A Protected Trust Resource (the Air/Atmosphere) Consistent With Article I, Section 27 of the Pennsylvania Constitution

Without getting into every detail of RGGI,<sup>2</sup> the most challenged part

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<sup>2</sup> E.g. offsets, allocated allowances to waste coal plants and heat/light (cogeneration) plants, ability to bank allowances, etc.

of RGGI is that EGUs generally must, via quarterly auction, purchase allowances to emit a certain amount of carbon dioxide into the atmosphere. The atmosphere that Pennsylvanians rely upon for clean air to breathe is a trust resource protected under Section 27. 1970 Pa. Legis. Journal – House 2269, 2274, 2275 (April 14, 1970) (noting, *inter alia*, that air is recognized as a “public good” in economics). But, like any trust resource, the atmosphere has limitations on how much degradation it can withstand before it cannot provide beneficiaries – present and future Pennsylvanians – with what they are constitutionally owed. Section 27 protects against degradation of the atmosphere to such an extent that it cannot support human or other life, now and in the future:

Section 27 recognizes the practical reality that environmental changes, whether positive or negative, have the potential to be incremental, have a compounding effect, and develop over generations. The Environmental Rights Amendment offers protection equally against actions with immediate severe impact on public natural resources and against actions with minimal or insignificant present consequences that are actually or likely to have significant or irreversible effects in the short or long term.

Robinson Twp. v. Com. (“Robinson II”), 83 A.3d 901, 959 (Pa. 2013)

(plurality) (discussing duty of impartiality); see also id. at n.46 (discussing “inevitable” political “bias toward present consumption of

public resources by the current generation” for which the trustee must account); PEDF I, 161 A.2d 916-919; 1970 Pa. Legis. Journal—House at 2271 (“This bill is a great step forward in assuring for ourselves and our posterity a natural environment of quality, rather than relegating ourselves to extinction or a mere survival level of existence.”).

For example, a cold-water trout stream has only so much assimilative capacity for pollutants, including temperature, before it no longer can sustain healthy trout species and provide recreational and aesthetic values to local communities and fishermen.

The atmosphere is no different. The atmosphere can only hold so much (in this instance) carbon dioxide before not only air quality suffers, but also and more alarmingly, particularly for future generations of Pennsylvanians, it can no longer sustain life. 52 Pa. Bull. at 2472-75. Human-generated carbon dioxide emissions have degraded the atmosphere to such a dangerous extent that future generations of Pennsylvanians’ constitutional right to a life-supporting atmosphere is in serious jeopardy. Id.; cf. Held v. Montana, 2023 Mont. Dist. LEXIS \*2, \*123-125 (CDV 2020-307), *on appeal to Montana Supreme Court at DA 23-*

0575.<sup>3</sup>

Further, Pennsylvania’s electricity generation sector, which RGGI focuses on:

is the ***greatest source of GHG [greenhouse gas] emissions in the Commonwealth***, accounting for nearly 30% of total emissions. GHG emissions from this sector are emitted ***primarily by burning fossil fuels such as coal and natural gas***. . . . Pennsylvania is the third-largest coal-producing state in the nation and second-largest natural gas producer.

PADEP 2021 Climate Action Plan, p.81 (emph. added)<sup>4</sup>; 52 Pa. Bull. at 2474-75<sup>5</sup>; cf. Held v. Montana, 2023 Mont. Dist. LEXIS \*2, at \*85-\*88.

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<sup>3</sup> This Court previously recognized that: (a) Pennsylvania and Montana are among the very small contingent of states that have placed environmental rights on par with political rights; and (b) reference to Montana case law may be helpful in defining the contours of Pennsylvania’s Environmental Rights Amendment. See, e.g. Robinson II, 83 A.3d at 953 (plurality) (comparing first clause of Section 27 to Montana’s interpretation of its Constitution); PEDE I, 161 A.3d at 918-19 (quoting same passage of Robinson II); see also 83 A.3d at 962-63 (plurality) (referencing other states).

<sup>4</sup> Available at: <http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=3925177&DocName=2021%20PENNSYLVANIA%20CLIMATE%20ACTION%20PLAN.PDF%20%20%3cspan%20style%3D%22color:green%3b%22%3e%3c/span%3e%20%3cspan%20style%3D%22color:blue%3b%22%3e%28NEW%29%3c/span%3e%209/21/2023#>

<sup>5</sup> PA’s RGGI rulemaking is consistent with the 2021 Climate Action Plan’s observations, and also states: “Considering that this Commonwealth has ***the fifth leading CO2 emitting electricity generation sector in the country***, this final-form rulemaking is a significant component in achieving the Commonwealth’s goals to reduce GHG emissions.”(emph. added).

For decades, if not centuries, both before and after Section 27 was enshrined in the Pennsylvania Constitution, private companies have sent pollutants from their operations into the air/atmosphere (a public trust resource) without much regard for the impact of those emissions on Pennsylvanians.<sup>6</sup> What was permitted as the *status quo* was private appropriation (via degradation) of a public good, which is fundamentally at odds with even common law public trust law’s restraints on alienation, Ill. Cent. RR. Co. v. State of Illinois, 146 U.S. 387 (1892); In re Downingtown, 161 A.3d 844, 877 (Pa. 2017),<sup>7</sup> in addition to Section 27. See, e.g., Robinson II, 83 A.3d at 955 (plurality)(noting drafters intended “public natural resources” to “capture the full array of resources implicating the public interest, as these may be defined by statute or at common law.”).

Traditional “command and control” permitting programs that mandate certain control technologies<sup>8</sup> to reign in private appropriation of the

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<sup>6</sup> And not just air either. As explained in Robinson Twp. v. Com., Pennsylvania has a “notable history of what appears retrospectively to have been a shortsighted exploitation of its bounteous environment, affecting its minerals, its water, its air, its flora and fauna, and its people.” 83 A.3d 901, 976 (Pa. 2013)(plurality).

<sup>7</sup> “The common law public trust doctrine strictly prohibits a governmental body from conveying public lands to an entity or person for private use.”

<sup>8</sup> LaCount, et al., “Reducing power sector emissions under the 1990 Clean Air Act Amendments: A retrospective on 30 years of program development,” 245 Atmospheric Env’t, Article 118012, p.2 (2021).

atmosphere for pollution do not tie emissions limitations directly to the actual social cost (degradation and its related impacts on human and wildlife) of the allowed emissions on the trust resource. They also rarely address the cumulative impact of emissions allowed across one or any industry. They also provide little to no flexibility or incentive to regulated entities to determine the most cost-effective means to reduce emissions.<sup>9</sup>

In contrast, auction-based<sup>10</sup> cap-and-trade or emissions trading programs such as RGGI address the cumulative impact of emissions and

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<sup>9</sup> LaCount, et al., at p.2; see also id. at p.5 (noting that the EPA's acid rain and similar emissions trading programs "contributed to development of effective pollution controls, providing covered sources with a variety of control options . . . by creating competition among different technologies, leading to improvements and innovations in those technologies and, as a result, lower costs.")

<sup>10</sup> Not every cap-and-trade system auctions allowances. For instance, the EPA's highly-successful sulfur dioxide trading system (with the goal of reducing acid rain) allocated allowances, which companies could trade between themselves as needed. This trading between companies still occurs in RGGI, but *after* each company or other entity purchases the allowances at auction.

In an allocation scenario, the regulatory agency does not obtain from companies the cost of the permitted emissions on the trust resource (the atmosphere). This conflicts with Section 27 and common law trust principles because the companies do not pay over to the trustee the funds needed to sustain and remedy the trust corpus; such funds could also have been used to support communities that experienced higher emissions for a period of time from power plants that needed more time to implement long-term capital investments to reduce pollution. Under an allocation framework, companies must still pay for the social cost of their emissions because that is a fundamental part of any emissions trading scheme, but *how* they pay the cost is more diffuse and, in some instances, companies that can make emissions reductions quickly without substantial capital investments stand to benefit more by selling allowances that they never needed in the first place.

The auction framework puts all companies on a more equal footing, and complies with Section 27 trust obligations by providing the trustee with funds to remedy atmospheric damage, and advance equity among communities that are

have requirements tied to the social cost of permitted emissions. Cap-and-trade programs internalize the negative externalities of pollution and its costs to society that normally would go unpaid by the business, but that are borne by communities and the environment.

Emissions trading programs are based on economic principles, including social cost and negative externalities. In a “typical” microeconomic market setting, a company does not “see” the cost of its pollution (a negative externality) as part of budget and production decisions. This does not mean that the company is not aware of the pollution resulting from its electricity production (i.e. its cost to society); rather, it means only that its *social cost* of pollution is not part of the company’s internal costs and budgeting decisions because there is no direct cost to the company as there would be with labor or capital. In basic economic market situation, an EGU would budget for coal (or another fossil fuel) and other inputs needed for production; equipment; technology and other operating and possibly legal costs. However, it does not budget for, *inter alia*, pollution cleanup or payment of health fees for those whose

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disproportionately affected by the regulated pollutant and/or the operation of the emission trading framework.



respiratory problems worsen because of the EGU's operations.<sup>11</sup> It likewise does not, in a typical market setting, pay for the impact of its emissions on the carrying capacity of the atmosphere.

An emissions market (cap-and-trade scheme) such as RGGI changes this arrangement. In an emissions market, the tradable good is an allowance or permit that is equal to a certain amount of a pollutant (here, carbon dioxide).<sup>12</sup> The "cap" on total emissions of that pollutant from all regulated entities accomplishes two things: (1) it accounts for the cumulative impact of those emissions; and (2) sets the overall supply of allowances in the market based on scientific data on the condition of the atmosphere (the trust resource) and what is needed to ameliorate past and ongoing damage to that trust resource.<sup>13</sup> Demand for emissions allowances to use the atmosphere – the trust resource – for the purpose of expelling carbon dioxide emissions depends on various exogenous factors such as (but not limited to): customer types (residential, industrial, etc.); overall demand; weather; and fuel costs.

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<sup>11</sup> This is under most normal conditions; however, legal action or legislation in response to significant health damage may result in the company paying these fees. Still, the company does not base its typical internal costs on such fees.

<sup>12</sup> LaCount, et al., at p.3.

<sup>13</sup> LaCount, et al., at p.3.

Thus, in economics terms, the Section 27 trust requires companies to bear the costs of their own externalities (pollution), rather than foisting those costs onto the public in the form of degradation of air quality and the atmosphere's (in)ability to support and foster continued human life and ecological stability. The RGGI auction allowance proceeds represent the cost to society of the carbon dioxide emissions allowed to be released into the air.

Translated from economic into trust terms, RGGI – as implemented by Pennsylvania – requires that companies pay for their private use (occupation of the air/atmosphere with pollution) of a public trust resource. The cost/price to use the trust resource (the air/atmosphere) results from science (the cap on cumulative emissions and how many allowances are to be auctioned) and market demand for use of the degraded trust resource.

The cap component of RGGI targets the cumulative impact of emissions from fossil-fuel-driven EGUs. The eventual lowering of the cap provides a means for balancing the constitutional obligation to protect the atmosphere/air quality and remedying degradation with ensuring that a valuable commodity – electricity – does not become prohibitively expensive or cease being produced by having a cap start out too low when companies are first adjusting to the regulatory framework. See Robinson II, 83 A.3d at

954 (protection of individual environmental rights means “economic development cannot take place at the expense of an unreasonable degradation of the environment;”); id. at 958 (no “freeze” of use of public natural resources necessary) (plurality).

II. Auction Allowance Proceeds Are Neither a Tax Nor a Traditional License Fee Because They Pertain to Usage of Trust Resources

RGGI’s cap-and-trade-and-invest framework governs use of a constitutionally-protected trust resource and generates funds subject to Section 27 trust limitations. It is similar both to existing programs that require payment to the Commonwealth to occupy trust property, and to compensation for natural resource damages.

The RGGI challengers and the Commonwealth Court focused on the narrow issue of whether RGGI functions as a tax, or a license fee in the traditional sense (as opposed to, for instance, submerged lands licenses, which govern usage of trust resources). However, RGGI technically is neither because it pertains to constitutionally-protected trust resources, and not simply the ability of a company to, for instance, operate a taxicab or barbershop. Indeed, in her dissent, Judge Ceisler noted this very issue:

Based upon the record before us, it does not seem that the emissions allowance auction process would impose what could be deemed fees in the traditional sense, but, by the same token, it is not entirely clear that the proceeds raised thereby would constitute a

tax. Given this, there is a genuine issue of material fact regarding the question of whether the Rulemaking establishes a tax or a fee. Accordingly, I would deny summary relief regarding this issue to both Petitioners and Respondents, and dissent from the majority's decision to the contrary.

Bowfin KeyCon Holdings, LLC v. Pa. Dep't of Env't Prot., 309 A.3d 157, 2023 Pa. Commw. Unpub. LEXIS 581, \*16 (Pa. Commw. Ct. 2023) (Ceisler, J., dissenting).

Under a traditional license fee framework, the fee has no “extra” representative meaning. It is nothing more than “a charge . . . imposed by the sovereign . . . upon a person within its jurisdiction for the privilege of performing certain acts and **which has for its purpose** the defraying of the expense of the regulation of such acts for the benefit of the general public.” Pa. Liquor Control Bd. v. Publicker Commercial Alcohol Co., 32 A.2d 914, 917 (Pa. 1943) (emph. added).

Similarly, with taxes, there is no “extra” meaning to tax revenue. “[A]n excise or a property tax . . . is levied by virtue of the government’s taxing power **solely for the purpose** of raising revenues.” Id. (emph. added). Unlike RGGI funds, taxes are held in the general fund. RGGI funds *cannot* be deposited in the general fund and used for non-trust purposes because the auction allowance funds are generated from usage of a Section 27 trust

resource. PEDF II, 255 A.3d at 314; see also PEDF I, 161 A.3d at 933-36; 35 P.S. § 4009.2(a).

Under RGGI and Section 27 as interpreted by this Court, RGGI auction proceeds cannot be put in the general fund and instead must go toward bolstering and remediating the trust resource – the atmosphere – and addressing the social costs of the companies’ private emissions. PEDF II, 255 A.3d at 314; see also PEDF I, 161 A.3d at 933-36. PADEP is also statutorily-limited to only use monies it collects “for use in the elimination of air pollution.” 35 P.S. § 4009.2(a); 52 Pa. Bull. at 2477.

Thus, RGGI in Pennsylvania is a cap-and-trade-and-*invest* program, where the investments must be used to ameliorate trust resource degradation, prevent further accumulation of the target pollutant that would worsen degradation, and support those most impacted by such degradation. See, e.g., 52 Pa. Bull. at 2482, 2507. The Commonwealth Court’s tax vs. license analysis completely ignores this Court’s precedent on funds from trust resources, and treats the auction proceeds as if they were to be spent like general fund monies, not funds restricted for Section 27 trust resource usage.

Thus, neither category (tax or traditional license fee) fits how RGGI functions. The RGGI auction allowance proceeds are the cost of private

companies' usage of, and associated impacts on, the atmosphere, which is a Section 27 trust resource. In economic terms, the auction proceeds represent what the company must pay under RGGI to compensate for the social cost of the emissions permitted to be released by the allowances. Without RGGI, that social cost would continue to be externalized onto Pennsylvanians, and companies would persist in appropriating trust resources for private purposes (i.e. pollution).

Existing Pennsylvania examples that *are* similar to RGGI include submerged lands licenses and streambed oil and gas leases, both of which require companies to pay for their private occupation of a trust resource (or “public good”) under both Section 27 and at common law: the beds of navigable waterways. See, e.g., 32 P.S. § 693.15; 25 Pa. Code §§ 105.31-105.35.<sup>14</sup> Under RGGI, a company must obtain allowances to effectively occupy part of the atmosphere (a trust resource) with a harmful pollutant, with a limitation on total emissions from the regulated entities set by RGGI.

Another example of payments connected to degradation of trust resources are natural resource damages, which are “a rare example of the

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<sup>14</sup> PADEP's website at <https://www.dep.pa.gov/Business/Water/Waterways/Encroachments/PermittingAndAuthorizations/Pages/Submerged-Lands-License-Agreement.aspx> outlines the additional statutory, regulatory, and common law public trust underpinnings for its submerged land license requirements.

‘polluter pays’ principle in practice—they require repayment for private externalities affecting natural resources.” Karen Bradshaw, Settling for Natural Resource Damages, 40 Harv. Envtl. L. Rev. 211, 226 (2016).<sup>15</sup>

Whereas submerged lands licenses require payment to occupy a given amount of a trust resource, natural resource damages focus on ensuring that the result of that private occupation – pollution/trust resource degradation – is monetarily compensated for so that the public does not bear the cost instead.

Natural resource damages are common in federal environmental statutes, wherein a particular entity of the federal government is a trustee charged with pursuing claims against polluters who damage a trust resource under the trustee’s jurisdiction. Id. at 227-230. Natural resource damages are a “remedy designed to make the public whole after environmental harm by restoring injured natural resources to their baseline conditions. The remedy is neither a fine nor payment for cleanup. Funds must be spent on restoration—they go directly to restoring the harmed resources.” Id. at 213-14. In other words, because of the trust framework under federal natural resource damages statutes, funds paid to federal

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<sup>15</sup> Available at: <https://journals.law.harvard.edu/elr/wp-content/uploads/sites/79/2015/11/Bradshaw-40-HELLR-211.pdf>

trustees in accordance with such laws must be held in trust and only used to remediate the damage for which they were paid. Id. at 219.

In Pennsylvania, we already have a system akin to federal natural resource damages statutes: the Environmental Rights Amendment, which, *inter alia*, establishes the Commonwealth as trustee of public natural resources. Pa. Const. art. I, § 27. Agencies like PADEP must use their statutory authority to accomplish similar but broader requirements than their federal trustee counterparts when it comes to protecting public natural resources from pollution.<sup>16</sup> RGGI does just that, with one difference from natural resources damages. Consistent with Section 27’s “reactive” and “anticipatory” protections, PEDE I, 161 A.3d at 919 (quoting Robinson II, 83 A.3d at 960-63), RGGI requires *prepayment* for private externalities,<sup>17</sup>

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<sup>16</sup> Federal government is a government of enumerated, and thus limited, power; whereas state governments have plenary police power to act for the general welfare, including delegation of authority to agencies like PADEP to act to promote wellbeing. Robinson II, 83 A.3d at 946-47 (plurality). However, regardless of who acts under state law, those actions must be consistent with the Environmental Rights Amendment. Id.

<sup>17</sup> To be clear, it is not DCS’s position that environmental degradation is consistent with the Environmental Rights Amendment so long as a company pays money to the Commonwealth to address the expected degradation. There needs to still be, *inter alia*, a compelling reason for the degradation and it needs to be the least degradation/intrusion on protected rights and resources possible, consistent with strict scrutiny standards as befits the fundamental rights protected by the Environmental Rights Amendment. Cf. 25 Pa. Code § 105.32(a)(limiting submerged lands licenses to water-connected projects).

RGGI addresses a necessary product in society – electricity and its production – and seeks to find a way to ensure that we continue to have reliable electricity *and* a livable environment. Stated differently, electricity may be necessary, but *fossil-fuel-*



consistent with past decisions of this Court that declare, *inter alia*, “The key to protecting our water is to *prevent* pollution from occurring.” Machipongo Land & Coal Co. v. Dep’t of Env’tl. Prot., 799 A.2d 751, 774 (Pa. 2002)(emph. added).

Indeed, Pennsylvanians have learned from history that forcing companies to prevent their pollution, and to provide funds to remedy degradation, is far less costly than the alternative, which is the very real tax – both monetarily and physically – that Pennsylvanians still bear from centuries of unrestrained private profits of the coal, timber, and oil and gas industries. PEDF I, 161 A.3d at 919 (quoting Robinson II, 83 A.3d at 960-63); cf. Held, 2023 Mont. Dist. LEXIS \*2, at \*125.

As with natural resources damages, but unlike taxes, RGGI auction proceeds cannot be sent into “general fund coffers”, 40 Harv. Env’tl. L. Rev. at 219; rather, under Section 27 and in accordance with this Court’s prior rulings, RGGI auction proceeds must be used to protect and support the trust corpus for the benefit of present and future generations of

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*produced* electricity is not, at least not to such an extent that we threaten our children and grandchildren’s futures. This is different than, for instance, a company’s desire to expand its manufacturing operations or to install a gas wellsite. Although it may be wise for the Commonwealth to require advance monetary payments for expected degradation that cannot be eliminated, the mere payment of money, without more (e.g. prevention of degradation in the first place), cannot make any kind of environmental degradation constitutional.

Pennsylvanians. PEDF II, 255 A.3d at 314; see also PEDF I, 161 A.3d at 933-36; Pa. Const. art. I, § 27. The Air Pollution Control Act also limits auction proceeds usage. 35 P.S. § 4009.2(a). Indeed, because the auction allowance proceeds represent the social cost of allowing a certain amount of carbon dioxide emissions (or, in different phrasing, the cost of a certain level of degradation to the trust corpus (including past damage that needs to be remedied)), the funds are subject to trust principles under Section 27 just like monies generated by oil and gas leases on state forest land.<sup>18</sup>

Natural resource damages allow “[m]ultiple potentially responsible parties . . . [to] be named for a single injury.” 40 Harv. Envtl. L. Rev. at 240. RGGI implements this principle by targeting fossil-fuel-fired EGUs for carbon dioxide reduction, as such operations necessarily rely on fossil fuel extraction, which carries its own hefty set of negative externalities including carbon and methane emissions, but which may be harder to regulate in a cap-and-trade framework. By focusing on fossil-fuel-fired EGUs, RGGI can

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<sup>18</sup> Auction allowance proceeds could also be used in part to address “hotspots” of heavier emissions in certain communities, which may result from a local power plant needing more time to implement pollution-reduction technology. The proceeds from auction allowances provide a means to support the local population that bears those heavier costs, which advances the trustee’s obligation of equity and impartiality under Article I, Section 27. Other RGGI state participants do use RGGI funds for, *inter alia*, “investing in environmental justice communities.”

<https://www.nyserda.ny.gov/About/Funding/Regional-Greenhouse-Gas-Initiative/Regional-Greenhouse-Gas-Initiative-Funded-Programs>

introduce incentives for fuel switching, technological development, modernizing, and other mechanisms that decrease carbon emissions not just from the regulated EGUs, but also the supply chain of fossil fuels.

Lastly, as a functioning market, RGGI (like other cap-and-trade programs) allows non-regulated entities such as NGOs to participate and buy allowances. In contrast, a typical tax framework “does not attract volunteers,” further hinting at the different goal and purpose of auction proceeds under RGGI. Cal. Chamber of Commerce v. State Air Res. Bd., 216 Cal. Rptr. 3d 694, 723 (Ct. App. 2017).

Pennsylvania’s RGGI rulemaking is a long-overdue effort to account for cumulative impacts, regulate harmful emissions, and ease the burden on over-polluted communities. This latter includes proposals (but not final) to use auction allowance proceeds to address historic environmental disinvestment and economic diversification that would help lessen environmental burdens and dependence on polluting industries, and correct environmental injustices. Use of the auction allowance proceeds is also appropriate to remedy and prevent further accumulation of the target pollutant – carbon dioxide – and thus continued environmental

degradation.<sup>19</sup> The market framework allows EGUs flexibility to determine for themselves how best to comply with the RGGI requirements, in contrast to a typical “command-and-control” regulation. All of this is consistent with trustee obligations under Section 27 to prevent and remedy the “degradation, diminution, or depletion” of public natural resources, in addition to ensuring sustainable development. PEDF I, 161 A.3d at 932 (quoting Robinson II, 83 A.3d at 956-57 (plurality)); Robinson II, 83 A.3d at 954, 958 (plurality). In sum, PADEP is using its existing statutory authority consistent with its Section 27 constitutional obligations to remediate a degraded trust resource that is currently projected to worsen without crucial action. See Robinson II, 83 A.3d at 959 (plurality).

III. The Commonwealth Court Relied on Non-Final Assumptions and a Limited Record, and Ignored Obligations Under Article I, Section 27 of the Pennsylvania Constitution, With Severe Implications

The Commonwealth Court’s decision undermines all of the foregoing, and in turn, threatens much more than simply climate change regulation.

First, as for its reasoning, the Commonwealth Court took an extremely narrow view of the auction proceeds, based on a limited record since it granted summary relief, and thus failed to recognize the specific

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<sup>19</sup> Reductions in carbon dioxide emissions may also improve air quality more broadly by reducing other pollutants such as sulfur dioxide and particulate matter emissions.

context and purpose of the auction proceeds and what they represent. The Commonwealth Court did not engage in any Section 27 discussion or analysis, or any discussion of what the auction proceeds represent either in Section 27 terms (prepayment for harm to a protected trust resource, and financial support for remedial action to that resource) or in economics terms (the social cost, across all EGUs, of the carbon dioxide permitted to be released in accordance with the allowances). The Commonwealth Court did not consider the Commonwealth's trustee obligation to prevent *and remedy* damage to air quality and atmosphere's health. PEDF I, 161 A.3d at 932 (quoting Robinson II, 83 A.3d at 956-57 (plurality)). The Commonwealth Court's decision undercuts this Court's PEDF decisions regarding the Environmental Rights Amendment and how revenue from trust-degrading activities is to be handled and used, and forces state agencies to ignore their Section 27 obligations when exercising their statutory authority.

It likewise ignored that the final allocation of revenue from auction proceeds *is not yet set*, and instead based its decision granting summary relief on "modeling [done] to estimate the economic impacts of this final-form rulemaking." 52 Pa. Bull. at 2507. PADEP produced such modeling likely to support the rulemaking's presentation to the Independent

Regulatory Review Commission; however, that modeling does not represent the final allocations of auction proceeds: “The Department plans to develop a draft plan for public comment outlining reinvestment options ***separate from this final-form rulemaking.***” 52 Pa. Bull. at 2507 (emph. added). Thus, arguably, the issue of whether the auction proceeds and RGGI as a whole are a license, a tax, or something else is not even ripe considering that there is no final agency plan of auction proceed usage.

Despite an incomplete record and failure to consider Section 27 in its analysis, the Court below found that RGGI is an unconstitutional tax because, allegedly, the auction allowance proceeds exceed modeled program administration costs. It did not analyze the auction allowance proceeds as prepayment for degradation to public natural resources, or its potential use to advance Section 27 trust purposes.

These flaws are serious and grounds for reversal, but the implications of allowing the Commonwealth Court’s decision (including by extension its reasoning) are far worse. If the Commonwealth Court’s decision is not corrected, it will undermine agencies’ existing statutory authority to require companies to pay for the actual financial impact (social cost) of their activities on constitutionally-protected public natural resources. It will undermine existing programs that already accomplish such purposes,

including submerged lands licenses and streambed oil and gas lease requirements for when companies drill under navigable waterways. It also may interfere with the Commonwealth’s ability to structure oil and gas leases on state land in such a fashion that the externalized costs of oil and gas development to trust resources do not outweigh the resulting revenue.

The decision below, if allowed to stand—which it should not—would also complicate or block new laws and regulations with such goals, i.e. to require companies to pay for the cost of their operations on trust resources. One prominent example includes the cost of plugging oil and gas wells, which, while companies do post bonds for plugging, they rarely cover long-term costs and Pennsylvanians are still paying to plug hundreds of thousands of abandoned oil and gas wells across the Commonwealth.<sup>20</sup>

The Commonwealth Court’s decision will block creative market-based systems, such as RGGI, that allow maximal flexibility for companies in complying with emissions and related requirements, in contrast to traditional “command and control” permitting. It is counterintuitive to squash a regulatory scheme that allows more flexibility for companies to

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<sup>20</sup> See Ted Boettner – Ohio River Valley Institute, “Addressing Pennsylvania’s Orphaned Well Crisis”, March 25, 2024 Testimony before Pennsylvania House Environmental Resources and Energy Committee, *available at*: <https://ohiorivervalleyinstitute.org/addressing-pennsylvanias-orphaned-well-crisis/>

comply with the law and to operate in such a way that Pennsylvanians benefit both from economic development and a healthy environment for decades to come.

All of the aforementioned consequences are directly contrary to the Environmental Rights Amendment. See, e.g., Robinson II, 83 A.3d at 977, 982 n.58 (plurality) (General Assembly cannot remove “necessary and reasonable authority” to carry out Section 27 obligations); PEDF I, 161 A.3d at 936.

Pennsylvania taxpayers and future generations are still paying “a tribute” for the failure of Pennsylvania government to make companies pay for their impacts to trust resources. PEDF I, 161 A.3d at 918-919 (quoting Robinson II, 83 A.3d at 960-63 (plurality)). If there is any tax here, it is on the people of Pennsylvania in the form of the continued burden on their health and wellbeing, both from pollution and degraded trust resources, *and* their pocketbooks to clean up the damages to the natural wealth<sup>21</sup> of this state that private entities have profited from without bearing the cost of their pollution – some of which is incredibly difficult (and, at times,

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<sup>21</sup> 1969 Pa. Legis. Journal 721, 722 (June 2, 1969)(“[L]et us pass this bill and give constitutional protection to the greatest wealth Pennsylvania has – its natural resources.”).



impossible) to remediate, such as acid mine drainage and aquifer contamination.

The decision below will allow, if not continue to allow, private appropriation of Section 27 trust resources, which is contrary not just to Section 27 but also to fundamental public trust principles. The use of the atmosphere for private pollution “storage” or emissions threatens not just our present generations, but also future generations of Pennsylvanians’ ability to live and survive. That private appropriation must be phased out and/or paid for accordingly to revive the trust resource so that it may sustain life and ensure the promise of the Section 27 trust for generations yet to come. The Commonwealth Court’s decision also continues to allow environmental injustices to persist across the Commonwealth, with the health, safety, and environment of communities in fossil-fuel-rich areas seen as less important than those people and places who benefit from such extraction and burning of fossil fuels. Absent programs like RGGI, Pennsylvania’s continued failure to take meaningful action to reign in greenhouse gas emissions is a dereliction of the state's duties under Section 27, and the Commonwealth Court’s decision exacerbates that failure.

RGGI puts the cost of environmental and trust resource degradation back where it belongs — with the companies and people causing it. There is no doubt that such a cost may be large – this Court recognized that fact in Robinson II and in PEDF when noting that restoration from coal exploitation could cost over 15 *billion* dollars. PEDF I, 161 A.3d at 917 (quoting Robinson II, 83 A.3d at 960-63 (plurality)). However, basic equity, and, ever since 1971, the Pennsylvania Constitution, requires that cost to be borne by the private entities and companies responsible for it. The Environmental Rights Amendment demands that Pennsylvania circumscribe economic development – even crucial economic activity such as electricity production – within the limits of what we, as human beings, need to exist, i.e., pure water, clean air, healthy ecosystems, and an atmosphere that can sustain life for generations to come.

### CONCLUSION

The Commonwealth Court erred in finding that RGGI is a revenue-generating tax. RGGI auction allowance proceeds are private entity payments to use a Section 27 trust resource, and would be subject to this Court's ruling that circumscribe the use of such funds – funds that can be used to address air quality degradation caused by the RGGI participants and for such necessary social and environmental programs that are

consistent with the mandates of Section 27. The Commonwealth Court erred in not considering Pennsylvania's participation in RGGI within the context of Section 27, particularly given that RGGI furthers the goals and purpose of the Environmental Rights Amendment. We respectfully urge this Honorable Court to reverse the decision below and uphold RGGI.

In the alternative, even if this Honorable Court were to find that the result of the decision below were valid, the reasoning for the result must be independently set forth in order to avoid erosion of agency statutory authority and threats to existing programs, and to ensure consistency with the Environmental Rights Amendment and this Court's jurisprudence illuminating the rights and duties of the Commonwealth thereunder.

Date: July 22, 2024

Respectfully,

/s/ Lauren M. Williams

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## **ATTACHMENT A**

Held v. Montana, 2023 Mont. Dist. LEXIS \*2 (CDV 2020-307), *on appeal to Montana Supreme Court at DA 23-0575*



Cited

As of: July 22, 2024 5:54 AM Z

## *Held v. State*

First Judicial District Court of Montana, Lewis and Clark County

August 14, 2023, Decided; August 14, 2023, Filed

Cause No. CDV-2020-307

### Reporter

2023 Mont. Dist. LEXIS 2 \*

RIKKI HELD, et al., Plaintiff, v. STATE OF MONTANA, et al., Defendant.

**Judges:** [\*1] Kathy Seeley, District Court Judge.

**Opinion by:** Kathy Seeley

### Opinion

#### **FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER**

#### **PROCEDURAL HISTORY**

On March 13, 2020, sixteen Montana youth (collectively Plaintiffs or Youth Plaintiffs) filed a Complaint for Declaratory and Injunctive Relief (Doc. 1) against the State of Montana, the Governor, Montana Department of Environmental Quality, Montana Department of Natural Resources and Conservation, Montana Department of Transportation, and Montana Public Service Commission (collectively Defendants or State). Plaintiffs' Complaint challenged the constitutionality of the State's fossil fuel-based state energy system, which they allege causes and contributes to climate change in violation of their constitutional rights guaranteed under Article II, Section 3; Article II, Section 4; Article II, Section 15; Article II, Section 17; Article IX, Section 1; Article IX, Section 3 of the Montana Constitution; and the Public Trust Doctrine. (Doc. 1 ¶¶ 3-4).

Specifically, the Complaint challenged the constitutionality of fossil fuel-based provisions of [Montana's State Energy Policy Act, Mont. Code Ann. § 90-4-1001\(1\)\(c\)-\(g\)](#); a provision of the [Montana Environmental Policy Act \(MEPA\), Mont. Code Ann. § 75-1-201\(2\)\(a\)](#) (MEPA Limitation), which forbids the State and its agents from considering the impacts of greenhouse gas (GHG) emissions or climate change in their environmental reviews; and the aggregate acts the State has taken to implement and perpetuate a fossil fuel-based energy system [\*2] pursuant to these two statutory provisions. (Doc. 1 ¶¶ 4, 105, 108, 118).

Youth Plaintiffs asked the Court for a declaration of law concerning their constitutional rights; a declaration of law that the fossil fuel-based provisions of [Montana's State Energy Policy, Mont. Code Ann. § 90-4-1001\(1\)\(c\)-\(g\)](#), are unconstitutional; a declaration of law that the MEPA Limitation is unconstitutional; and a declaration of law that Defendants' past and ongoing affirmative aggregate actions to implement a fossil fuel-based energy system—carried out in furtherance of the State Energy Policy and perpetuated through the MEPA Limitation—are unconstitutional. (Doc. 1, Requests for Relief # 1-5). The Complaint further requested injunctive relief to enjoin Defendants from subjecting Plaintiffs to the fossil fuel-based State Energy Policy, [Mont. Code Ann. § 90-4-1001\(1\)\(c\)-\(g\)](#), the MEPA Limitation, and aggregate acts; order Defendants to prepare a statewide GHG accounting; order Defendants to develop a remedial plan to reduce statewide GHG emissions; retain

jurisdiction until Defendants have fully complied with the Court's orders; and, if necessary, appoint a special master to review the remedial plan for efficacy. (Doc. 1, Requests for Relief # 6-9). Plaintiffs also requested an order awarding Youth Plaintiffs [\*3] their reasonable attorneys' fees and costs, and any such further or alternative relief as the Court deems just and equitable. (Doc. 1, Requests for Relief # 10-11).

On April 24, 2020, Defendants filed a motion to dismiss pursuant to Mont. R. Civ. P. 12(b)(1), 12(b)(6), and 12(h)(3). (Doc. 11). After briefing and oral argument, the Court issued an Order on Motion to Dismiss on August 4, 2021, (Doc. 46), partially granting and partially denying Defendants' motion to dismiss.

The Court found that Plaintiffs' requests for the Court to order Defendants to develop a remedial plan, to retain jurisdiction over the matter until Defendants complied with the remedial plan, and, if necessary, appoint a special master to assist the Court in reviewing the remedial plan exceeded the Court's authority under the political question doctrine. (Doc. 46 at 21). Nevertheless, the Court held that prudential standing considerations did not merit dismissal because the Court "may grant declaratory relief regardless of injunctive relief. The court possesses the authority to grant declaratory or injunctive relief, or both." (Doc. 46 at 22).

Finally, the Court declined to dismiss Plaintiffs' challenge to MEPA for want of administrative exhaustion, finding [\*4] that "Youth Plaintiffs properly brought this action in district court rather than through the administrative review process." (Doc. 46 at 24). The Order granted Defendants' motion with respect to Plaintiffs' Requests for Relief # 6, 7, 8, and 9, and denied Defendants' motion with respect to Plaintiffs' Requests for Relief # 1, 2, 3, 4, and 5.

Defendants filed their Answer on September 17, 2021, (Doc. 53), denying virtually all allegations in the Complaint and raising several affirmative

defenses.

Pursuant to the December 27, 2021, Scheduling Order (Doc. 61), the parties engaged in discovery throughout 2022.

On May 6, 2022, Defendants filed a Motion for Clarification of Order on State's Motion to Dismiss pursuant to Rule 60(a), Mont. R. Civ. P. (Doc. 84), seeking clarification on whether Plaintiffs' Request for Relief # 5 had been dismissed by the August 04, 2021, Order on Motion to Dismiss. Plaintiffs filed a Response in Opposition on May 20, 2022. (Doc. 102).

On June 10, 2022, Defendants filed a Petition for Writ of Supervisory Control (OP 22-0315), requesting the Montana Supreme Court exercise supervisory control and "dismiss Request for Relief 5 from this case." On June 14, 2022, the Supreme Court denied the Petition. [\*5] (OP 22-0315).

On June 15, 2022, the Court issued an Order Partially Granting Defendants' Motion to Modify Scheduling Order and Setting Scheduling Conference. (Doc. 145) (Modified Scheduling Order). The Modified Scheduling Order governed the timeline thereafter. Pursuant to the Modified Scheduling Order, the parties engaged in discovery through January 9, 2023 — including disclosing expert witnesses (Docs. 222, 227), rebuttal expert witnesses (Docs. 240, 242), and conducting dozens of depositions.

On June 30, 2022, the Court issued an Order on Defendants' Rule 60(a) Motion for Clarification (Doc. 158), clarifying that "requests for injunctive relief contained in the complaint were dismissed, except for Request for Relief 5." (Doc. 158 at 3).

On July 19, 2022, Defendants filed a Motion for Independent Medical Examination, or, in the Alternative, Motion to Strike Opinions and Testimony of Plaintiffs' Expert Dr. Lise Van Susteren Pursuant to Rule 35(a), Mont. R. Civ. P. (Doc. 163), alleging that Plaintiffs' allegations of mental health impacts as a result of climate change

had placed their mental health at issue. (Doc. 163 at 2). On October 14, 2022, the Court issued an Order denying Defendants' motion (Doc. 225), ruling that [\*6] IMEs were unwarranted because "Plaintiffs have not placed their mental health at the center of this case, nor is it really and genuinely in controversy," (Doc. 225 at 6), and because "Defendants have not established good cause for the requested examinations." (Doc. 225 at 7).

On July 20, 2022, Defendants filed a Second Motion for Clarification of Order on State's Motion to Dismiss pursuant to Rule 60(a), Mont. R. Civ. P. (Doc. 167). Defendants' second motion for clarification sought clarification from the Court as to why Plaintiffs' Requests for Relief # 1, 2, 3, 4, and 5 "don't violate the political question doctrine." (Doc. 167 at 3). On September 22, 2022, the Court issued an Order (Doc. 217), denying Defendants' Second Rule 60(a) Motion for Clarification of Order on State's Motion to Dismiss.

On September 30, 2022, pursuant to the Modified Scheduling Order, Plaintiffs disclosed their expert witnesses and expert disclosures. (Doc. 222). On October 31, 2022, Defendants disclosed their expert witnesses and expert disclosures. (Doc. 227). On November 30, 2022, the parties exchanged rebuttal expert disclosures. (Docs. 239, 242).

Discovery closed on January 9, 2023. Between the parties, discovery included the completion of [\*7] thirty-six depositions, the exchange of twenty-two expert reports, the exchange of over 50,000 pages of documents, and responses to dozens of interrogatories.

On February 1, 2023, Plaintiffs and Defendants file motions *in limine*. Plaintiffs filed seven motions *in limine* (Docs. 260, 262, 264, 266, 268, 270, 272) and Defendants filed seven motions *in limine* (Docs. 284, 286, 288).

On February 1, 2023, Defendants filed a Motion for Summary Judgment pursuant to Mont. R. Civ. P. 56. (Doc. 290). On February 14, 2023, Plaintiffs filed a response brief opposing summary judgment.

(Doc. 299). Plaintiffs filed sixteen declarations from Plaintiffs, experts, and counsel in support of their response brief. (Docs. 300-315). On February 28, 2023, Defendants filed a reply. (Doc. 332).

On March 16, 2023, Governor Greg Gianforte signed House Bill 170 into law, repealing the [Montana State Energy Policy, Mont. Code Ann. § 90-4-1001](#).

On March 31, 2023, Defendants filed a Motion to Partially Dismiss for Mootness pursuant to Mont. R. Civ. P. 12(b)(1), 12(b)(6), and 12(h)(3). (Doc. 339). Defendants moved to dismiss Plaintiffs' claims premised on the [Montana State Energy Policy Act, Mont. Code Ann. § 90-4-1001](#), on the ground that the repeal of [Mont. Code Ann. § 90-4-1001](#) (HB 170) mooted claims concerning the statute.

On April 14, 2023, Plaintiffs filed a Response Brief in Opposition to Defendants' Motion to Partially [\*8] Dismiss for Mootness. (Doc. 354). Plaintiffs filed nine declarations from experts in support of their response. (Docs. 355-363).

On April 26, 2023, unable to reach agreement on a joint proposed Pre-Trial Order, the parties submitted separate proposed pre-trial orders. (Docs. 366, 367). On April 27, 2023, a Final Pre-Trial Conference was held with the Court.

In response to Judge Moses' April 6, 2023, Order on Summary Judgment in *MEIC, et al. v. DEQ, et al.*, Yellowstone County Cause No. DV-56-2021-1307, the Montana Legislature adopted House Bill 971, an amendment to clarify the MEPA Limitation. On May 10, 2023, Governor Greg Gianforte signed into law HB 971, which clarified [Mont. Code Ann. § 75-1-201\(2\)\(a\)](#). The clarifications in HB 971 explicitly prohibit Montana's agencies from considering "an evaluation of greenhouse gas emissions and corresponding impacts to the climate in the state or beyond the state's borders" in their MEPA reviews.

On May 12, 2023, the Court heard oral argument

on Defendants' Motions for Summary Judgment, Motion to Partially Dismiss for Mootness, and Motion to Stay Proceedings.

On May 18, 2023, Defendants filed a Motion to Dismiss MEPA Claims based on the enactment of HB 971. (Doc. 376). On June [\*9] 1, 2023, Plaintiffs filed a response brief opposing Defendant's motion to dismiss the claims. (Doc. 382). Defendants filed a reply and request for oral argument on June 9, 2023. (Doc. 385).

On May 19, 2023, Governor Gianforte signed into law Senate Bill 557, amending several provisions of MEPA, [Mont. Code Ann. § 75-1-201](#).

On May 23, 2023, the Court issued an Order on Defendants' Motions to Partially Dismiss for Mootness and For Summary Judgment. (Doc. 379). As to Defendants' Motion to Partially Dismiss for Mootness (Doc. 343), the Court granted Defendants' motion and dismissed without prejudice Plaintiffs' Claims involving the State Energy Policy and Defendants' aggregate acts taken pursuant to and in furtherance of the State Energy Policy on redressability and prudential standing grounds. (Doc. 379 at 3-4). The Court denied Defendants' motion for summary judgment and allowed Plaintiffs' MEPA claims to proceed to trial. (Doc. 379 at 20-26).

On June 1, 2023, the Court issued an order on the remaining Motions *in limine*. (Doc. 381). The Court granted Plaintiffs' motion # 2; granted in part and denied in part Plaintiffs' motions # 3 and 5; and denied Plaintiffs' motions # 4, 6, and 7. The Court granted Defendants' [\*10] motions # 1, 4, 5, 6, 7; and denied Defendants' motions # 2 and 3.

On June 2, 2023, Defendants filed an Emergency Petition for Writ of Supervisory Control with the Montana Supreme Court (OP 23-0311), requesting again that the Supreme Court exercise supervisory control and reverse this Court's denial of the State's motion for summary judgment. The State also asked the Supreme Court to stay the trial set to begin June 12, 2023.

On June 6, 2023, the Montana Supreme Court denied the Emergency Petition for Writ of Supervisory Control. (OP 23-0311). The Supreme Court observed that Defendants had "not demonstrated that HB 971's amendments alter the allegations the Plaintiffs make in the Complaint" concerning the MEPA provision. (OP 23-0311 at 3).

On June 7, 2023, this Court entered the Final Pre-Trial Order governing this proceeding. (Doc. 384). In addition to "supersed[ing] the pleadings as to the remaining issues and govern[ing] the course of the trial of this case," (Doc. 384 at 38), the Court's Final Pre-Trial Order denied Defendants' Motion to Dismiss MEPA Claims (Doc. 376). (Doc. 384 at 38).

Trial began June 12, 2023, and ended on June 20, 2023.

On June 19, 2023, while trial was proceeding, [\*11] Defendants filed a Bench Memorandum on the Constitutional and Procedural Limits of the Montana Environmental Policy Act. (Doc. 396). On June 25, 2023, Plaintiffs filed a response (Doc. 402). This briefing discussed in detail SB 557.

## FINDINGS OF FACT <sup>1</sup>

The Findings of Fact and Conclusions of Law are based on the evidence and arguments presented at trial. The Court heard live testimony from twenty-seven witnesses. Plaintiffs presented testimony from twenty-four witnesses and Defendants presented testimony from three witnesses. The Court admitted one hundred sixty-eight of Plaintiffs' exhibits and four of Defendants' exhibits.

## I. PARTIES

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<sup>1</sup> Citations to the trial transcript, exhibits, and demonstrative slides are in brackets and identified by witness using their initials. For example, "SR-14", refers to Steven Running demonstrative slide 14.



## A. Plaintiffs

1. Plaintiffs are youth citizens of Montana. When the Complaint was filed in March 2020, Plaintiffs were from two to eighteen years old. They are now between five and twenty-two years old.
2. Plaintiffs are Rikki Held, Lander Busse, Sariel Sandoval, Kian Tanner, Georgianna Fischer, Kathryn Grace Gibson-Snyder, Olivia Vesovich, Claire Vlases, Taleah Hernandez, Badge B., by and through his guardian Sara Busse, Eva L., by and through her guardian Mark Lighthiser, Mica K., by and through his guardian Rachel Kantor, Jeffrey K., by and through his guardian [\*12] Laura King; Nathaniel K., by and through his guardian Laura King, Ruby D., by and through her guardian Shane Doyle, and Lilian D., by and through her guardian Shane Doyle.
3. Rikki Held is from Broadus, Montana, was eighteen years old when this case was filed, and is currently twenty-two years old.
4. Lander Busse is from Kalispell, Montana, was fifteen years old when this case was filed, and is currently eighteen years old.
5. Sariel Sandoval is from Ronan, Montana, and lives on the Flathead Indian Reservation. She was seventeen years old when this case was filed and is currently twenty years old.
6. Kian Tanner is from Bigfork, Montana, was fourteen years old when this case was filed, and is currently eighteen years old.
7. Georgianna Fischer is from Bozeman, Montana, was seventeen years old when this case was filed, and is currently twenty-one years old.
8. Kathryn Grace Gibson-Snyder is from Missoula, Montana, was sixteen years old when this case was filed, and is currently nineteen years old.
9. Olivia Vesovich is from Missoula, Montana, was sixteen years old when this case was filed, and is

currently twenty years old.

10. Claire Vlases is from Bozeman, Montana, was seventeen years old [\*13] when this case was filed, and is currently twenty years old.
  11. Taleah Hernandez is from Poison, Montana, was sixteen years old when this case was filed, and is currently nineteen years old.
  12. Badge B. is from Kalispell, Montana, was twelve years old when this case was filed, and is currently fifteen years old.
  13. Eva L. is from Livingston, Montana, was fourteen years old when this case was filed, and is currently seventeen years old.
  14. Mica K. is from Missoula, Montana, was eleven years old when this case was filed, and is currently fifteen years old.
  15. Jeffrey K. is from Montana City, Montana, was six years old when this case was filed, and is currently nine years old.
  16. Nathaniel K. is from Montana City, Montana, was two years old when this case was filed, and is currently five years old.
  17. Ruby D. is from Bozeman, Montana, was twelve years old when this case was filed, and is currently fifteen years old.
  18. Lilian D. is from Bozeman, Montana, was nine years old when this case was filed, and is currently twelve years old.
- ## B. Defendants
19. Defendants are the State of Montana, Governor Greg Gianforte, Montana Department of Environmental Quality, Montana Department of Natural Resources [\*14] and Conservation, Montana Department of Transportation, and Montana Public Service Commission.
  20. The State of Montana is a governmental entity.

21. Greg Gianforte is the current Governor of Montana. He is sued in his official capacity.
22. As Governor, Governor Gianforte is charged with seeing that the State's laws are faithfully executed, including the Constitution. [Mont. Const. Art. VI, Sec. 4.](#)
23. Governor Gianforte has supervisory authority over the principal departments of the executive branch.
24. Governor Gianforte holds cabinet meetings, communicates with other state officers, oversees budget expenditures, and has authority to issue executive orders. [Def. Answer, Doc. 11 ¶ 84].
25. Defendant Montana Department of Environmental Quality (DEQ) is a department of the State of Montana.
26. DEQ is the primary administrator of Montana's environmental regulatory, environmental cleanup, environmental monitoring, pollution prevention, and energy conservation laws. [Def. Answer, Doc. 11 ¶ 88].
27. DEQ is mandated to ensure that projects and activities for which it issues permits, licenses, authorizations, or other approvals comply with Montana's environmental laws and rules (including MEPA) to maintain and improve Montana's [\*15] natural environment. [Agreed Facts, Final PTO, Doc. 384 at 2; Def. Answer, Doc. 11 ¶ 88].
28. DEQ is mandated to comply with the Montana Constitution and state law. [CD 1308:6-12].
29. DEQ issues air quality permits for applications that demonstrate compliance with all applicable requirements of the Federal and/or Montana Clean Air Act and their implementing rules, including but not limited to coal and natural gas-powered energy plants, coal mining operations, and oil and gas refineries. [Agreed Facts, Final PTO, Doc. 384 at 2; 3. Answer, Doc. 11 ¶ 90].
30. DEQ prepares environmental review documents under MEPA, including for projects related to fossil fuels, such as natural resource extraction and power generating facilities. [CD 1313:21-1315:13].
31. DEQ has authority to certify certain pipelines that meet the definition provided in the Major Facility Siting Act, § 75-20-104(9)(b), MCA, and that comply with the requirements of the Major Facility Siting Act. [Agreed Facts, Final PTO, Doc. 384 at 2; Def. Answer, Doc. 11 ¶ 91].
32. DEQ permits coal mining for applications which meet the requirements set forth in Titles 82 (Minerals, Oil, and Gas) and 75 (Environmental Protection). DEQ has issued permits for surface coal mining in Montana [\*16] on state, private, and federal land. [Agreed Facts, Final PTO, Doc. 384 at 2; Def. Answer, Doc. 11 ¶ 92].
33. Pursuant to its statutory authority, DEQ has discretion to deny and revoke permits. [SN 1392:24-1393:6].
34. Since 2011, pursuant to the MEPA Limitation, DEQ has not analyzed in its environmental review documents the cumulative impacts of the permits it issues on GHG emissions or climate change. [AH 846:1-3, 818:11-819:10].
35. Defendant Montana Department of Natural Resources and Conservation (DNRC) is a department of the State of Montana.
36. DNRC prepares environmental review documents under MEPA. [Shawn Thomas Perpetuation Deposition, 42:1-16].
37. DNRC manages the resources of the state trust lands through the State Board of Land Commissioners (Land Board). [Agreed Facts, Final PTO, Doc. 384 at 2; Def. Answer, Doc. 11 ¶ 95].
38. DNRC regulates, permits, and authorizes activities that result in GHG emissions in Montana. [Agreed Facts, Final PTO, Doc. 384 at 2].
39. DNRC issues leases, permits, and licenses for uses of lands under its jurisdiction, including

- licenses for exploration and leases for production and extraction of oil and gas in Montana and permits for drilling. [Agreed [\*17] Facts, Final PTO, Doc. 384 at 2].
40. DNRC has exercised its authority to grant easements for the operational rights-of-way for interstate pipelines, with the approval of the Land Board, and issues land use licenses for the construction of rights-of-way and other activities on state lands and waterways for the construction and operation of interstate pipelines, which are used to transport fossil fuels. [Agreed Facts, Final PTO, Doc. 384 at 2; Def. Answer, Doc. 11 ¶ 95].
41. DNRC, through its Forestry Division, is responsible for planning and implementing forestry and fire management programs, as well as authorizing and permitting commercial timber sales on trust lands. [Agreed Facts, Final PTO, Doc. 384 at 3; Def. Answer, Doc. 11 ¶ 97].
42. Defendant Montana Department of Transportation (MDT) is a department of the State of Montana.
43. MDT is responsible for state planning in the transportation sector and is charged with collecting and enforcing fuel taxes. [Agreed Facts, Final PTO, Doc. 384 at 3].
44. Defendant Montana Public Service Commission (PSC) is a governmental entity.
45. PSC regulates, supervises, and controls public utilities, common carriers, railroads, and pipelines. [Agreed [\*18] Facts, Final PTO, Doc. 384 at 3].
46. PSC sets standard-offer contracts for qualifying facilities and utility rates. [Agreed Facts, Final PTO, Doc. 384 at 3].
47. PSC is responsible for the safety of interstate pipelines, including crude oil or petroleum products that operate within or through Montana. [Agreed Facts, Final PTO, Doc. 384 at 3].
48. Defendants' performance of their respective governmental functions has resulted in the extraction, transportation, and consumption of fossil fuels. [Agreed Facts, Final PTO, Doc. 384 at 3].
49. The extraction, transportation, and consumption of fossil fuels results in GHG emissions. [Agreed Facts, Final PTO, Doc. 384 at 3].
50. Defendants authorize the operation of coal-fired powerplants in Montana. [Def. Answer, Doc. 11 ¶ 118].
51. The drilling for and production of oil in Montana is authorized by Defendants. [Def. Answer, Doc. 11 ¶¶ 90, 96].
52. Montana has an abundance of energy sources, including fossil fuels yet to be extracted. [PE 944:24-946:4; PE-37].
53. The Montana Legislature enacted [Mont. Code Ann. § 90-4-1001](#) (repealed) and the MEPA Limitation as amended. [Def. Answer, Doc. 11 ¶ 82].
54. Montana's State Energy Policy was codified at [Mont. Code Ann. § 90-4-1001](#). [Def. Answer, Doc. 11 ¶ 112]. [\*19]
55. [Mont. Code Ann. § 90-4-1001](#) was enacted by the Montana Legislature in 1993 and amended in 2011. [Def. Answer, Doc. 11 ¶ 115].
56. The Montana Legislature repealed [Mont. Code Ann. § 90-4-1001](#) in 2023. The Governor signed the repeal, HB 170, into law on March 16, 2023.
57. The provisions of MEPA governing environmental reviews are codified at [Mont. Code Ann. § 75-1-201](#).
58. In 2011, the Montana Legislature amended MEPA to limit the scope of environmental reviews—enacting the MEPA Limitation, which prohibited Montana's agencies from considering in their MEPA reviews "actual or potential impacts beyond Montana's borders . . . [or] actual or

potential impacts that are regional, national, or global in nature."

59. The Montana Legislature adopted amendments to clarify the MEPA Limitation in 2023. The Governor signed the clarifying legislation, HB 971, into law on May 10, 2023.

60. The MEPA limitation now provides that Montana's agencies are prohibited from considering "an evaluation of greenhouse gas emissions and corresponding impacts to the climate in the state or beyond the state's borders." [Mont. Code Ann. § 75-1-201\(2\)\(a\)](#) (enacted by HB 971, 68th Legislature (2023)).

61. The 2023 Montana Legislature amended various provisions of MEPA that pertain to legal challenges to MEPA environmental reviews. [\*20]

62. SB 557 was introduced on March 27, 2023, passed by the Legislature, and signed into law by the Governor on May 19, 2023.

63. SB 557 enacted a new provision, [Mont. Code Ann. § 75-1-201\(6\)\(a\)\(ii\)](#), which eliminates the preventative, equitable remedies for MEPA litigants who raise GHG or climate change issues. The new subsection provides in part:

[a]n action alleging noncompliance or inadequate compliance with a requirement of parts 1 through 3, including a challenge to an agency's decision that an environmental review is not required or a claim that the environmental review is inadequate based in whole or in part upon greenhouse gas emissions and impacts to the climate in Montana or beyond Montana's borders, cannot vacate, void, or delay a lease, permit, license, certificate, authorization, or other entitlement or authority unless the review is required by a federal agency or the United States congress amends the federal Clean Air Act to include carbon dioxide as a regulated pollutant.

[Mont. Code Ann. § 75-1-201\(6\)\(a\)\(ii\)](#) (enacted by SB 557, 68th Legislature (2023)).

64. Defendants cited [Mont. Code Ann. § 75-1-201\(6\)\(a\)\(ii\)](#) and SB 557 as foreclosing redressability in this case in their June 19, 2023, Bench Memorandum on the Constitutional and Procedural Limits of the Montana Environmental Policy Act. (Doc. [\*21] 396).

## II. CLIMATE SCIENCE AND PROJECTIONS.

### A. Climate Science

65. Dr. Steven Running is a University Regents Professor Emeritus of Global Ecology in the College of Forestry and Conservation at the University of Montana. [SR-2]. Dr. Running currently co-chairs the standing Committee for Earth Science and Application from Space of the National Academy of Science. In 2007, Dr. Running shared the honor of the Nobel Peace Prize as a chapter Lead Author for the 4th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). [P193]. Dr. Running provided expert testimony in the general areas of the climate system, including the energy balance and imbalance, the physics of GHG emissions that are driving climate change, the global carbon cycle, the global hydrologic cycle, how they control this energy imbalance, and then how human caused fossil fuel development is harming Montana's ecosystems and hydrology. Dr. Running is a well-qualified expert, and the Court found his testimony informative and credible.

66. Dr. Cathy Whitlock is Regents Professor Emerita of Earth Sciences and a Fellow of the Montana Institute on Ecosystems at Montana State University (MSU). Dr. Whitlock was lead [\*22] author of the 2017 Montana Climate Assessment, and in 2020 co-authored a state-level Montana Climate Solutions Plan and a 2021 special report of the Montana Climate Assessment entitled Climate Change and Human Health in Montana. Dr. Whitlock was also co-lead author of the 2021 Greater Yellowstone Climate Assessment. Dr. Whitlock provided expert testimony explaining

how human-caused fossil fuel development and the resulting release of CO<sub>2</sub> into the atmosphere are harming Montana's ecosystems, water supplies, communities, and the Plaintiffs themselves. Dr. Whitlock also discussed recent trends and future projections in temperature, precipitation, snow accumulation and snowmelt, and stream runoff in Montana and explained how they affect terrestrial ecosystems, communities, and the livelihoods of people that depend on these ecosystem services. Dr. Whitlock's testimony included projections for Montana's future based on continuing or increasing the present rate of GHG emissions. Dr. Whitlock's testimony primarily focused on the effect GHG emissions in Montana. Dr. Whitlock is a well-qualified expert, and the Court found her testimony informative and credible.

67. There is overwhelming scientific [\*23] consensus that Earth is warming as a direct result of human GHG emissions, primarily from the burning of fossil fuels. [SR 102:10-103:9, 125:11-22, 141:18-20; CW 257:14-25; P6, P13, P23, P34, P223, P143; SR-22].

68. Fossil fuels include coal, crude oil or its derivatives (such as gasoline or jet fuel), and natural gas. [PE 901:24-902:8].

69. While several GHGs are emitted from the burning of fossil fuels, carbon dioxide (CO<sub>2</sub>) is the GHG most responsible for trapping excess heat within Earth's atmosphere. [SR 114:20-116:10].

70. Science is unequivocal that dangerous impacts to the climate are occurring due to human activities, primarily from the extraction and burning of fossil fuels. [SR 103:5-9; P6, P23, P34, P223, P143; SR-46, SR-47].

71. A substantial portion of every ton of CO<sub>2</sub> emitted by human activities persists in the atmosphere for as long as hundreds of years or millennia. As a result, CO<sub>2</sub> steadily accumulates in the atmosphere. [SR 166:2-10, 168:2-10; CW 279:14-20, 314:20-315:8, 318:2-5].

72. The cumulative effect of GHG emissions causes the impacts to the climate being experienced today. [SR 168:2-16]. Human activity and the burning of fossil fuels have accelerated the accumulation [\*24] of CO<sub>2</sub> to the point that 42% of the total accumulation of CO<sub>2</sub> emissions has happened in the last thirty years. [SR 141:16-142:2; SR-42].

73. It has long been understood that certain GHGs, including CO<sub>2</sub> and methane (CH<sub>4</sub>), trap heat in the atmosphere, causing the Earth to warm. [SR 107:16-25]. An American, Eunice Newton Foote, was one of the first scientists to research and write about the ability of atmospheric carbon dioxide to affect solar heating in the 1850s. [SR 108:22-109:3; SR-14].

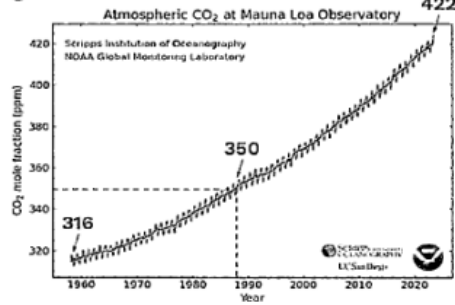
74. In 1896, Svante Arrhenius, a Swedish chemist, wrote that the practice of burning fossil fuels emitting CO<sub>2</sub> could one day warm the planet. [SR 108:1-8]. Arrhenius, and other early climate scientists, understood that the more CO<sub>2</sub> that was added to the atmosphere, the more the surface of the Earth would warm. [SR 108:8-13]. At the time of Arrhenius's work, atmospheric CO<sub>2</sub> levels were approximately 295 parts per million (ppm). Pre-industrial levels were approximately 280 ppm. [SR 109:22-25; SR-14].

75. In 1958, Dr. David Keeling began the modern monitoring of atmospheric CO<sub>2</sub> at Mauna Loa, Hawaii, a remote location not near any local CO<sub>2</sub> sources. [SR 111:12-21]. Keeling's data, now replicated at dozens [\*25] of stations worldwide, proved that CO<sub>2</sub> has continued to rise every year from 1958 to the present from an initial concentration of 315-316 ppm in 1958, to an annual mean level of around 424 ppm today. [SR 112:22-113:4, 113:16-114:8]. The curve showing a long-term increase in CO<sub>2</sub> concentrations has become known as the "Keeling Curve." [SR 110:22-111:11, 113:20].

76. Between 1960 and 2000, CO<sub>2</sub> levels rose at about 2 ppm per year, but since approximately 2000, CO<sub>2</sub> levels are rising at about 3 ppm per year,

primarily from fossil fuel emissions. [SR 117:14-20, 118:1-12, 121:9-11; SR-21].

#### Keeling Curve



77. CO<sub>2</sub> levels have fluctuated throughout history, but the rate of increase in atmospheric CO<sub>2</sub> is 100 times faster than in natural CO<sub>2</sub> fluctuations and cycles, and it is happening in a very short timeframe that is unprecedented in the geologic record. [SR 119:20-121:11; SR-19].

78. The continuous rise in atmospheric CO<sub>2</sub> has caused global, national, and Montana air temperatures to rise, as measured by meteorological stations. Total global temperature rise over the last 120 years is on average 2.2°F, or about 1.2°C. [SR 132:19-22; SR-38; CW 262:4-21; CW-18, CW-19, CW-20].

79. Montana is heating faster than the [\*26] global average because higher latitudes are heating more quickly. [CW 263:20-264:7].

80. Montana is warming, and the rate of warming is increasing. [CW 266:15-16].

81. The Earth has warmed by 1.3 to 2.2°F in only the last thirty-five years, as atmospheric CO<sub>2</sub> concentrations have risen from 350 ppm to over 420 ppm today. [SR 130:14-18; SR-35, SR-64]. It previously took 140 years for the Earth to warm by 0.9°F. [SR-35]. The Earth is heating more quickly now. 2020 was the second warmest year on record, and land areas were record warm. The ten warmest years on record have occurred since 2005, and since 1981, a new global temperature record has been set every three years. Since 1980, the Earth has not experienced a single year with below long-term average temperatures. [SE 131:20-132:10; SR-

37].

82. The Earth's energy imbalance (the difference in energy from sun arriving at the Earth and the amount radiated back to space) is what climate scientists describe as the most critical metric for determining the amount of global heating and climate change we have already experienced and will experience as long as the Earth's energy imbalance exists. [SR 122:1-15, 129:17-20; SR-34]. Scientists measure [\*27] and calculate how much extra energy, or heat, is being retained in Earth's systems, like oceans, ice, air, and land surface, compared to what Earth's natural balance would be if more heat escaped our atmosphere. [SR 122:1-15, 129:21-130:4].

83. The Earth's energy imbalance is currently significant and is due to accumulation of energy within Earth's oceans, ice, land, and air, with the energy measured in joules and the rate of additional energy measured in watts per square meter. [SR 124:14-125:18]. A watt is the addition of one joule of energy in one second, which is then averaged by the area of the Earth to yield watts per square meter. From 1971 to 2018, the Earth gained about 360 zeta joules of heat (a zeta is a unit with 21 zeros; a trillion has 12 zeros). [SR-29]. Adding this much energy over forty-eight years yields an energy imbalance of about 0.5 W m<sub>2</sub>. However, the rate of energy addition has continued to increase due to increasing GHG emissions and the Earth's energy imbalance for 2010 to 2018 is about 0.9 W m<sub>2</sub>. [SR 122:14-24; SR-29; P79].

84. 358 zeta joules are enough energy to bring Flathead Lake to boil 40,000 times over. [SR 125:3-6; SR-30].

85. As long as there is an [\*28] energy imbalance, the Earth will continue to heat, ice will continue to melt, and weather patterns will become more extreme. [SR 127:7-22, 131:9-15, 137:6-9, 149:2-14]. If more GHGs are added to the atmosphere and more incoming energy received from the sun is trapped as thermal energy, the Earth's climate system will continue to heat up. [SR 125:7-22].

86. The scientific consensus is that CO<sub>2</sub> from fossil fuel pollution is the primary driver of Earth's energy imbalance. [SR 117:21-118:12; 125:11-22]. Due to the buildup of CO<sub>2</sub> from about 280 ppm to 419 ppm in the last 140 years (and to a lesser extent other GHGs), more solar energy is now retained on Earth and less energy is released back to space. [SR 130:8-14; P20, P22, P79; SR-14].

87. The buildup of CO<sub>2</sub> and the current Earth energy imbalance is due to anthropogenic changes in the environment, not natural variability. [SR 103:5-9, 121:7-11].

88. Approximately 89% of annual anthropogenic CO<sub>2</sub> emissions, or 35 gigatons of CO<sub>2</sub>, is attributable to burning fossil fuels. [SR 115:9-17; SR-20]. Approximately 11% of annual anthropogenic CO<sub>2</sub> is from land use change, which includes wildfires, agricultural burning, and deforestation. [SR 115:18-22, [\*29] 116:7-15; SR-20]. This means that fossil fuel use is around 10 times as large as other sources of emissions due to human management. [SR 115:15-21]. In terms of the CO<sub>2</sub> humans emit each year, approximately 48% of these emissions end up in the atmosphere, 29% are absorbed in back up in the biosphere, and 26% are absorbed by the oceans. [SR 115:7-117:10; SR-20].

89. Until atmospheric GHG concentrations are reduced, extreme weather events and other climactic events such as droughts and heatwaves will occur more frequently and in greater magnitude, and Plaintiffs will be unable to live clean and healthy lives in Montana. [SR 128:22-129:5, 131:5-15, 149:2-150:7; SR-45; LVS-44].

90. There is scientific certainty that if fossil fuel emissions continue, the Earth will continue to warm. [SR 106:15-18, 168:20-24; SR-46, SR-47].

91. Each additional ton of GHGs emitted into the atmosphere exacerbates impacts to the climate. [SR 106:15-18, 188:3-6; CW 279:14-20, 314:20-315:8, 318:2; P143].

92. Every ton of fossil fuel emissions contributes to global warming and impacts to the climate and thus increases the exposure of Youth Plaintiffs to harms now and additional harms in the future. [SR 168:17-169:7; [\*30] CW 279:14-20, 314:20-315:8, 318:2-5; PE-40].

## **B. Climate Change Projections.**

93. Computer models used by scientists are an important tool for predicting climate change and are reasonably relied upon by members of the scientific community. [SR 90:23-91:9].

94. Projections indicate atmospheric CO<sub>2</sub> and other GHGs will increase the severity of all impacts to the climate for the foreseeable future, absent drastic reduction in fossil fuel use and the resulting GHG emissions. [SR 106:1-18, 169:22-170:10, 170:16-22; CW 269:14-18; SR-46, SR-47].

95. There is a strong scientific consensus that as GHG emissions continue to increase, impacts to the climate will become more severe. [SR 106:15-18, 137:3-9; SR-43].

96. The yearly days in Montana with extreme heat, meaning temperatures over 90 degrees, is expected to increase by 11-30 days by midcentury, and by as much as two months by the end of the century. [CW 273:6-20; CW-24, CW-28]. At the same time, the number of days above freezing will increase by weeks to months in the future. [CW 273:6-20, 2:75:21-276:7; CW-27; P222].

97. Projections indicate a high-emission scenario results in 9.8°F of warming in Montana by 2100, relative to temperatures in 1971-2000. [\*31] An intermediate emission scenario projects an increase of 5.6°F in Montana by 2100, relative to temperatures in 1971-2000. [CW 270:1-271:9; CW-23; P222].

98. According to the Intergovernmental Panel on Climate Change (IPCC), "Climate change is a threat to human well-being and planetary health (*very high confidence*). [SR-48]. There is a rapidly



closing window of opportunity to secure a liveable and sustainable future for all (*very high confidence*) . . . The choices and actions implemented in this decade will have impacts now and for thousands of years (*high confidence*)." [SR 149:15-150:7; P143; SR-48, SR-63; LB-43].

99. According to the IPCC, "[i]n the near term, every region of the world is projected to face further increases in climate hazards (*medium to high confidence*, depending on region and hazard), increasing multiple risks to ecosystems and humans (*very high confidence*). Hazards and associated risks expected in the near-term include an increase in heat-related human mortality and morbidity (*high confidence*), food-borne, water-borne, and vector-borne diseases (*high confidence*)." [SR-46, SR-47; LB-42].

### **III. CLIMATE CHANGE HARMS CHILDREN AND SPECIFICALLY THE YOUTH PLAINTIFFS.**

100. [\*32] Dr. Lori Byron obtained a Doctor of Medicine degree in 1984. She has been a board-certified pediatrician since 1988. Dr. Byron earned a M.S. in Energy Policy and Climate from Johns Hopkins in 2020. From 1988-2015, Dr. Byron worked with the Indian Health Service in Crow Agency, Montana, providing primary care, emergency care, and public health services to Crow Indian children. Dr. Byron now works as a pediatric hospitalist at SCL Health in Billings, Montana. Dr. Byron has decades of experience caring for children who have suffered Adverse Childhood Events (ACEs). Over the past decade, Dr. Lori Byron and her husband, Dr. Rob Byron, have made presentations on climate change and health locally, nationally, and internationally. Dr. Lori Byron finished a six-year term on the Executive Committee of the Council on Environmental Health and Climate Change with the American Academy of Pediatrics and a six-year term on the Children's Health protection Advisory Committee with the Environmental Protection Agency (EPA). Dr.

Byron was an author on the 2021 report "Climate Change and Human Health in Montana: A Special Report of the Montana Climate Assessment," as well as other climate and health publications. [\*33]

101. Dr. Byron provided expert testimony that climate change and the air pollution associated with it are negatively affecting children in Montana, including Youth Plaintiffs, with a strong likelihood that those impacts will worsen in the absence of aggressive actions to mitigate climate change. Dr. Byron outlined ways in which climate change is already creating conditions that are harming the health and well-being of the Youth Plaintiffs. Dr. Byron testified that reducing fossil fuel production and use, and mitigating climate change now, will benefit the health of the Youth Plaintiffs now and for the rest of their lives. Dr. Byron is a well-qualified expert, and the Court found her testimony informative and credible.

102. Dr. Lise Van Susteren is a board certified general and forensics clinical psychiatrist, in practice for thirty years. She is a Clinical Associate Professor of Psychiatry and Behavioral Sciences at George Washington University in Washington, D.C. In 2009, Dr. Van Susteren co-convened one of the first conferences on the psychological effects of climate change. In 2013, Dr. Van Susteren worked with Dr. James Hansen and other experts on a paper, Assessing "Dangerous Climate [\*34] Change": Required Reductions of Carbon Emissions to Protect Young People, Future Generations and Nature. (Hansen et al., 2013). In May 2018, Dr. Van Susteren received the Distinguished Fellow award of the American Psychiatric Association, its highest membership honor. Dr. Van Susteren has helped develop youth climate anxiety assessment tools, conducted research and reviewed data in assessing the mental health of young people faced with climate change. Dr. Van Susteren provided expert testimony on the physiological harms caused by climate change to Montana's youth, including the Youth Plaintiffs, the psychological harms caused by the MEPA Limitation, and the availability of remedies to



alleviate Plaintiffs' psychological injuries. Dr. Van Susteren is a qualified expert, and the Court found her testimony credible.

103. Michael Durglo, Jr., is a member of the Confederated Salish and Kootenai Tribes (CSKT). He has a Bachelor of Science degree in Environmental Science from Salish Kootenai College. Mr. Durglo has worked in different capacities for the CSKT for over three decades. In his current role as Head of the Tribal Preservation Department and Chairman of the Climate Change Advisory [\*35] Committee (CCAC), Mr. Durglo has worked extensively with tribal elders and youth on climate related issues. He has been involved with the Institute for Tribal Environmental Professionals' Climate Change Adaptation Planning Workshop, and he served as the co-chair of the National Tribal Science Council and the chair of the EPA Region 8 Tribal Operations Committee, consisting of EPA tribal environmental directors in Montana, Wyoming, Colorado, Utah, and North and South Dakota. He has taught workshops and seminars on climate adaptation planning throughout North America. Mr. Durglo is a qualified expert and the Court found him informative and credible.

104. Children are uniquely vulnerable to the consequences of climate change, which harms their physical and psychological health and safety, interferes with family and cultural foundations and integrity, and causes economic deprivations. [LB 473:12-24, 474:12-477:12; LVS 1177:5-8, 1202:6-24, 1215:13-24, 1217:2-1222:11; MDJ 597:9-18, 600:23-604:14, 609:23-610:10; LB-9, LB-15, LB-16; LVS-11, LVS-25].

105. Children are at a critical development stage in life, as their capacities evolve, and their physiological and psychological maturity develops [\*36] more rapidly than at any other time in life. [LB 474:12-477:12, 485:10-486:1; LVS 1177:10-21, 1213:7-23, 1215:13-24].

106. The brains and lungs of children and youth are not fully developed until around age 25. [LB 474:18-25; LVS 1213:7-16].

107. All children, even those without pre-existing conditions or illness, are a population sensitive to climate change because their bodies and minds are still developing. [LB 473:12-24, 474:12-477:12; LVS 1177:2-1178:12, 1213:7-23; LB-9; LVS-11].

108. The physical and psychological harms are both acute and chronic and accrue from impacts to the climate such as heat waves, droughts, wildfires, air pollution, extreme weather events, the loss of wildlife, watching glaciers melt, and the loss of familial and cultural practices and traditions. [LB 498:12-25, 524:11-22; LVS 1178:13-1179:6, 1196:6-11, 1200:7-1201:25, 1202:6-24, 1204:21-1205:19, 1206:19-1209:12, 1218:2-16, 1219:25-1220:11, 1221:19-21; MDJ 595:18-596:2, 597:6-18, 600:23-604:14, 606:11-607:2, 608:1-13, 609:23-610:10].

109. Climate change can cause increased stress and distress which can impact physical health. [LB 526:8-16; LVS 1188:16-24; LVS-15]. Dr. Van Susteren observed that Youth Plaintiffs [\*37] testified to specific personal consequences. For example:

a. Grace feels fearful due to the glaciers disappearing from a state she loves.

b. Sariel has suffered significant distress due to the impacts of climate change on culturally important plants, and snow for creation stories. Her cultural connection to the land increases this impact.

c. Mica has experienced a sense of loss from having to stay inside due to wildfire smoke.

d. Olivia expressed despair due to climate change.

e. Claire has been impacted by fear and loss from glaciers melting, and anxiety over whether it is a safe world in which to have children.

110. Heat waves are associated with significant psychological stress. Increased heat and temperature negatively affect cognition and are linked to increased incidence of aggression and exacerbation of pre-existing mental health

- disorders. [LVS 1197:1-1198:7, 1200:7-12; LVS-29].
111. Children have a higher risk of becoming ill or dying due to extreme heat. [LB-15, LB-16].
112. Drought is associated with anxiety, depression, and chronic despair. [LVS 1200:24-1201:25].
113. Wildfires, including those witnessed by Badge, are traumatic. Being surrounded by wildfires can make the world feel [\*38] unsafe and the inability to breathe clean air creates anxiety. [LVS 1202:6-24, 1204:21-1205:19].
114. The threat of loss can be enough to cause mental health harms, especially when there are no signs the future will be any different. [LVS 1203:15-1204:6].
115. As climate disruption transforms communities, some Plaintiffs are experiencing feelings that they are losing a place that is important to them.
116. The IPCC has found, with *very high confidence*, that climate change has "detrimental impacts" on mental health and the harms to mental health are expected to get worse. [LVS 1185:12-1186:3, 1192:23-1194:9, 1195:6-13; P127; LVS-23, LVS-24].
117. The 2021 report, *Climate Change and Human Health in Montana*, found that "[t]he mental health impacts of climate change are profound and varied." [LVS-27]. Extreme weather events, prolonged heat and smoke, and environmental change can all impact mental health and increase feelings of disconnectedness and despair. [LVS 1196:6-11; P31; LVS-28].
118. Exposure to extreme heat can cause heat rash, muscle cramps, heatstroke, damage to liver and kidney, worsening allergies, worsening asthma, and neurodevelopmental effects. [LB 485:2-9; P31; LB-13, LB-14]. [\*39]
119. The psychological harms caused by the impacts of climate change can result in a lifetime of hardships for children. [LVS 1194:4-9, 1210:2-1211:2, 1213:24-1215:4; P127; LVS-12].
120. The physiological features of children make them disproportionately vulnerable to the impacts of climate change and air pollution. [LB 474:14-25, 475:4-10; LVS 1213:7-23; LB-9, LB-10; LVS-11].
121. Children have a higher basal metabolic rate, which makes it harder for them to dissipate heat from their bodies. [LB 475:14-21].
122. Children breathe in more air per unit of time than adults and consume more food and water proportional to their body weight, making children more susceptible to polluted or contaminated air, water, or food. [LB 476:21-477:12].
123. Typical child behavior and physiology—which involves spending more time recreating outdoors and more difficulty self-regulating body temperature—render children more susceptible to excess heat, poor air quality, and other climate change impacts. [LB 476:21-477:12, 481:9-19].
124. Childhood exposure to climate disruptions and air pollution can result in impaired physical and cognitive development with lifelong consequences. Air pollution can trigger or [\*40] worsen juvenile idiopathic arthritis, leukemia, and asthma in children. [LB 482:9-21, 502:4-22; LB-25; LVS 1205:20-1206:8, 1207:18-1208:3].
125. The air quality where Plaintiffs live has been negatively impacted by smoke from wildfires contributed to by climate change.
126. Allergies are increasingly prevalent among children and anthropogenic climate change is extending the allergy season and exacerbating allergy symptoms. An increase in these symptoms can affect children's physical and psychological health by interfering with sleep, play, school attendance, and performance. [LB 484:25-485:9, 508:2-16; LVS-30].
127. Climate change is contributing to an increase

in the severity and frequency of asthma in children. Six million children in the U.S. ages 0-17 have asthma, which translates to approximately one in every twelve children. [LB 485:7-8, 503:1-14, 505:4-25; LB-26, LB-30].

128. Children who have pre-existing respiratory conditions, including asthma, are especially vulnerable to climate impacts, including increasing air pollution and rising temperatures. Wildfire smoke has harmed the health of Plaintiffs Olivia, Jeffrey, and Nate, all who have pre-existing health conditions, and other [\*41] Plaintiffs, including Badge and Eva. [LB 505:12-506:20, 508:23-509:1; LB-28].

129. Plaintiffs Olivia and Grace are distressed by feeling forced to consider foregoing a family because they fear the world that their children would grow up in. [LB 497:4-21; LVS 1214:21-1215:1, 1221:19-1222:5; GGS 208:3-22].

130. Plaintiffs Rikki, Kian, Claire, and Taleah, face economic deprivations, including barriers to keeping family wealth and property intact and decreased future economic opportunities.

131. Extreme heat threatens the health of competitive athletes, including Kian, Georgi, Claire, and Grace. [LB 490:6-491:15; LB-18].

132. For indigenous youth, like Ruby, Lilian, and Sariel, extreme weather harms their ability to participate in cultural practices and access traditional food sources, which is particularly harmful to indigenous youth with their place-based cultures and traditions. [LB 491:23-493:9; MDJ 579:19-580:9].

133. Because of their unique vulnerabilities, their stages of development as youth, and their average longevity on the planet in the future, Plaintiffs face lifelong hardships resulting from climate change. [LB 474:14-25, 475:4-10; LVS 1177:2-1178:12, 1189:1-6, 1194:4-9, 1210:2-1211:2, [\*42] 1213:7-23, 1215:13-24].

134. Youth are more vulnerable to the mental

health impacts of climate change because younger people are more likely to be affected by the cumulative toll of stress and have more adverse childhood experiences (ACEs). ACEs increase the likelihood of cumulative trauma that leads to mental and physical illness, as well as an increased risk of early death. [LB 521:14-16, 5236-15; LVS 1210:2-1211:2; LB-33; LVS-31].

135. ACEs can cause prolonged fear, anxiety, and stress, cognitive impairments, and unhealthy risk behaviors. ACEs can also cause long-term health impacts including increased risk of obesity, diabetes, heart disease, depression, strokes, chronic obstructive pulmonary disease, and broken bones. [LB 516:3-20, 519:16-520:4, 522:17-523:2; LB-34].

136. Children born in 2020 will experience a two to sevenfold increase in extreme events, particularly heatwaves, compared with people born in 1960. [LB 495:1-11, 497:1-3; P45; LB-20].

137. According to the IPCC, "Climate change is a threat to human well-being and planetary health (*very high confidence*)." The IPCC stated, "Without urgent, effective, and equitable mitigation and adaptation actions, climate change increasingly [\*43] threatens ecosystems, biodiversity, and the livelihoods, health and wellbeing of current and future generations (*high confidence*)." [LB 530:11-533:9; LB-43, LB-44; P143; SR-61].

138. The unrefuted testimony at trial established that climate change is a critical threat to public health. [LB 536:10-537:14].

139. Actions taken by the State to prevent further contributions to climate change will have significant health benefits to Plaintiffs. [LB 534:25-535:9].

#### **IV. CLIMATE CHANGE IS ALREADY ADVERSELY AFFECTING MONTANA'S NATURAL ENVIRONMENT.**

140. Anthropogenic climate change is impacting, degrading, and depleting Montana's environment and natural resources, including through increasing temperatures, changing precipitation patterns, increasing droughts and aridification, increasing extreme weather events, increasing severity and intensity of wildfires, and increasing glacial melt and loss. [JS 655:2-658:10, 659:6-660:11; *see generally* SR, CW, DF; CW-56; DF-20].

141. Climate change impacts result in hardship to every sector of Montana's economy, including recreation, agriculture, and tourism. For example, private water supplies will be harmed. [SR 144:13-145:17; CW-52].

142. Montana has already [\*44] warmed significantly more than the global average. [CW 263:12-17, 263:20-264:7; CW-18, CW-19].

143. All parts of Montana have seen a long-term trend of increasing mean annual temperatures since 1950. Winter and spring have warmed the most [CW 267:18-268:20; CW-21; P6].

144. There is a scientific consensus that rising temperatures in Montana are due to rising GHG concentrations, primarily CO<sub>2</sub>. [SR 103:5-9, 117:25-118:12; CW 269:18-25].

145. Montana's snowpack has been decreasing and is likely to Continue decreasing with warmer temperatures, as a long-term trend caused by impacts to the climate. [CW 283:11-19; CW-33, CW-35, CW-55; DF 421:12-23].

146. Montana's April 1, Snow Water Equivalent, which is an important metric for how much water will be available during the dry summer months in Montana, has been declining since the 1930s. [CW 284:23-286:15; CW-34].

147. The decline in snowpack is directly attributed to elevated temperatures due to high levels of GHG emissions. [CW 283:11-19, 288:3-10].

148. Warming temperatures in Montana are resulting in more precipitation falling as rain

instead of snow, particularly in western Montana. This results in reduced snowpack and shorter snowpack runoff [\*45] duration in the spring and summer. Warming temperatures and rapid snowmelt and rain-on-snow events have been a major cause of spring flooding in Montana. [CW 291:17-292:20].

149. Extreme spring flooding events are consistent with climate change, including more spring precipitation, which can cause flash flooding when rain falls on snow. [SR 144:24-145:8; SR-44]. Spring flooding is expected to increase in frequency with increased climate change. [CW 291:15-292:20].

150. The 2018 Shields River flooding and the 2022 Yellowstone River flooding event are examples of rain on snow and heavy precipitation events that will be more frequent with climate change. [CW 291:15-292:20].

151. Dr. Dan Fagre holds a Ph.D. from the University of California, Davis. He joined the National Park Service as a research scientist in 1989 and, in 1991, he became the Climate Change Research Coordinator at Glacier National Park as part of the nationwide United States Global Change Research Program. His position was transferred to the United States Geological Survey (USGS), where he served until his retirement in 2020, after which he has continued as Scientist Emeritus. At Glacier National Park, Dr. Fagre helped develop [\*46] a national climate change research program within the National Park Service, coordinating with other scientists at national parks from Florida to Alaska. He built a research program centered on Glacier Park as a representative mountain ecosystem, engaging faculty and scientists from Montana universities and across the U.S. [P190]. Dr. Fagre is a well-qualified expert, and his testimony was informative and credible.

152. Glacier National Park is a major driver of the regional economy and a source of fresh water for countless communities. [Def. Answer, Doc. 54 ¶ 159; DF 404:10-406:10, 407:1-3, 408:11-25, 426:2-

17; DF-13].

153. The glaciers in Glacier National Park were an early focus of the U.S. Geological Survey climate change research because they are excellent indicators of impacts to the climate. Located above the rest of the mountain ecosystem, glaciers respond only to climatic forces that affect summer temperatures that melt ice and snow and winter snow accumulation (i.e., snowpack). [DF 394:15-396:1, 396:25-397:17].

154. Of the approximately 146 glaciers present in Glacier National Park in 1850, only twenty-six glaciers larger than twenty-five acres remained in 2015. 82% of Glacier [\*47] Park's glaciers are gone and there has been a 70% loss of area of all glaciers. [DF 418:1-8, 422:25-424:4; DF-17, DF-20].

155. Since 1900, glaciers in Glacier Park lost 66% of their area, making Montana the largest region for glacier loss in the U.S. lower forty-eight. Agassiz Glacier, Grinnell Glacier, Jackson Glacier, Sperry Glacier, and Thunderbird Glacier have all experienced significant retreat. [DF 409:9-23, 410:23-415:5, 412:13-21, 415:12-416:20; P61-P64; DF-8, DF-15, DF-16, DF-18, DF-20, DF-21].

156. The scientific consensus is that the retreat of Glacier Park's glaciers over the past century is due to human GHG emissions (mainly CO<sub>2</sub> from fossil fuel burning). [DF 409:24-410:19, 416:21-417:15, 422:8-19, 424:5-11, 428:13-24].

157. The current ice retreat of Glacier Park's glaciers is in response to modern, human-caused warming of the region. [DF 428:13-24].

158. Computer models project the loss of Glacier Park's glaciers if fossil fuel emissions continue to rise. [DF 425:9-23].

159. The loss of Glacier National Park's glaciers will affect the water sources of many communities, stream and river hydrology, local economies, and the recreational opportunities of several Plaintiffs because [\*48] they will be denied access to natural

resources enjoyed by previous generations of Montanans. [DF 404:10-406:10, 407:1-3, 408:11-25, 426:2-17; DF-13].

160. If GHG emissions are reduced glaciers would slow their melting, eventually stabilize, and then begin to grow again. [DF 428:1-12].

161. Climate change results in water levels in Montana's rivers and lakes that are routinely well below normal levels in summer and fall months and water temperatures that are well above historical levels. [JS 686:18-687:4, 690:7-17, 692:22-25, 693:2-7; JS-25].

162. Dr. Jack Stanford received his Ph.D. in Freshwater Ecology at the University of Utah. [JS-2]. He is Professor Emeritus at the Flathead Lake Biological Station (FLBS) of the University of Montana. He was the Director and Bierman Professor of Ecology at the University of Montana (1980-2016). His primary area of research is aquatic ecosystem processes, including influences of human activities. He has published over 220 scientific papers and books on aquatic ecosystem processes, including influences of human activities. [P194]. Dr. Stanford is a well-qualified expert, and his testimony was informative and credible.

163. Montana is part of the northern [\*49] Rocky Mountain region. The northern Rocky Mountains are a headwaters region, including for the Missouri River system to the East and the Columbia River System to the West, where most of the water originates as snow. [Def. Answer, Doc. 54 ¶ 157].

164. Montana is a key "water tower" of the Continent. Water that drains from the Rocky Mountains feeds three of the great rivers of North America: the Columbia, the Saskatchewan, and the Missouri-Mississippi. Snow at high elevations provides eighty-five percent of the fresh water that people use in Montana. [DF 405:22-406:10, 407:16-409:1; DF-13; JS 656:21-657:7].

165. The accumulation of winter snowpack in the mountains naturally acts as a reservoir for the

hotter, drier months, gradually melting with onset of spring, and in summer providing continuous flow downstream, which is critical in the period of less precipitation and warmer temperatures. [SR 152:2-18]. Some accumulations are held in mountain glaciers which add meltwaters to the flow paths. [DF 407:16-409:1; DF-13].

166. Precipitation also is retained in lakes and wetlands where a large share of runoff penetrates into the ground, feeding aquifers that store water or augment river and [\*50] stream flows. [JS 655:20-24, 657:13-17, 660:12-661:7; JS-4].

167. Montana's river and lake ecosystems are interconnected with each other and with aquatic and terrestrial ecosystems beyond Montana's borders. [JS 646:2-647:2]. The interconnectivity of Montana's river and lake ecosystems includes being connected with groundwater and atmospheric waters. [JS 661:8-12; JS-4, JS-8, JS-9; P82].

168. The rivers of Montana are interlinked and their flows and the quantity of materials (e.g., sediments) that they naturally transport are now, without functioning glaciers, increasingly dependent on seasonal rain and Snow. These river networks transport and deliver the water and materials that sustain the natural and cultural (human) elements of Montana's ecosystems. [JS 661:8-664:18, 646:2-647:2; JS-4; DF-19].

169. Montana's water resources are critically important to Youth Plaintiffs and all Montana citizens and to many people beyond the State's borders. Montanans must have a dependable supply of clean freshwater. [JS 659:6-19; JS-25].

170. Anthropogenic climate change is disrupting the natural range of variation in the flow paths of Montana's river systems. Compared to the 1960s, the summer streamflow [\*51] in Montana's rivers has decreased by approximately 20% and stream temperatures have increased between 1-2°C. [JS 666:15-667:20; JS-10, JS-25].

171. As a result of anthropogenic climate change:

a. Surface temperatures in Flathead Lake are too warm for bull and cutthroat trout to sustain their historic populations. [JS 687:5-14].

b. The Flathead River is experiencing low streamflow and a decline in cutthroat trout populations due to warm temperatures and low water. Bull trout populations have also declined in Flathead Lake. [JS 687:5-14].

c. The Missouri River is experiencing discharge declines, and increase in stream temperatures, fishing restrictions, and algae blooms. [JS 687:15-688:25].

d. The Clark Fork River is experiencing low streamflow and discharge declines. [CW 292:21-293:18; CW-42].

e. The Yellowstone River is experiencing discharge declines, low streamflow, increasing temperatures, fish die offs due to diseases, record-setting floods, a decline in brown trout populations, and algae blooms. [JS 676:4-25, 689:9-690:1].

f. The Powder River is experiencing low streamflow and a decline in water quality. [JS 690:7-17].

g. The Madison River is experiencing increased temperatures, declining [\*52] discharge, fishing closures, a decline in brown trout populations, algae blooms, fish die offs and river closures. [JS 692:2-10].

h. The Blackfoot River is experiencing declining discharge, increased temperatures, and river closures. [JS 692:22-25].

i. The Smith River is experiencing record low flows in June, increased temperatures, and fishing restrictions. [JS 693:2-7].

j. The Shields River is experiencing low flows and river closures. [JS 693:9-10].

k. The Bitterroot River has experienced increased temperatures, a reduction in bull trout habitat, algae blooms, and fishing closures. [JS 693:12-22].

172. One impact of anthropogenic climate change to Montana's aquatic ecosystems is that runoff (spring spate) from snowmelt is days to weeks earlier. Loss of snowpack also accelerates warming and water loss owing to reduced reflection than would occur if the snowpack was sustained. [JS 670:20-671:2].

173. Low water levels and abnormally warm water temperatures create harmful conditions for fish and other aquatic organisms. [JS 671:3-17].

174. Access to boating and fishing on certain rivers and lakes in Montana has been limited, and in some instance completely foreclosed, because of low river [\*53] flows or high-water temperatures. These changes limit the ability of some Plaintiffs to fish and access the State's rivers and lakes for sport or recreation. [SR 152:25-153:9, 153:10-13; JS 679:7-15].

175. Wildfires resulting from climate change have caused nitrogen levels in Montana's lakes to increase. This has caused nutrient imbalances that threaten the plant and animal life in the lakes. [JS 683:1-684:4].

176. If GHG emissions continue to rise, impacts to the climate will further harm Montana's wildlife and fisheries, and the ability of Plaintiffs to hunt and fish. [JS 679:7-15; 687:8-14].

177. The western United States, including Montana, has experienced a trend of increased drought and heat stress from climate change, which has killed trees and altered ecosystem dynamics, and this trend toward hotter and drier summers will continue in the future. [SR 106:1-18, 146:18-21, 156:2-17; CW 258:24-259:8, 283:3-10; CW-44].

178. Droughts in Montana are more expansive and longer term which negatively affects stream systems: aquifer systems become depleted due to reduced infiltration of streamflow and rainfall. Where aquifers contribute significantly to base flow maintenance in Montana streams, [\*54] the outcome is even more extreme and with sustained

drying. [JS 677:7-678:1].

179. Anthropogenic climate change is producing a shift from snow to rain earlier in the year, and flooding from intense but extreme, short-duration flooding is more commonly occurring today than in the past (especially in the spring). That ultimately means less water is retained in the drainage network. [JS 676:12-25].

180. Increases in the frequency, duration, and/or severity of and heat stress associated with climate change are fundamentally altering the composition, structure, and biogeography of forests in Montana. [SR 106: 1-14]. There is already evidence of accelerating forest mortality in western forests, and this acceleration is clearly tied to increasing temperatures and plant water stress. [SR 156:2-17, 163:9-164:2].

181. Montana's forests are being drastically altered due to the combination of drought, pest infestations, and wildfires. [SR 156:12-157:15].

182. Climate scientists have long known that increasing temperatures intensify drought conditions, and the combination of drier and hotter weather leads to larger, more frequent, and severe wildfires. [SR 106:1-14, 157:2-158:6].

183. The wildfire season [\*55] in Montana is two months longer than it was in 1980s. [SR 159:7-13]. The lengthening of the fire season is largely due to declining mountain snowpack, earlier spring snowmelt, decreased summer precipitation, and warmer summer temperatures leading to deficits in soil and fuel moisture—which are all due to increasing GHG emissions. [SR 106:1-14, 156:24-157:13, 159:18-160:6, 160:22-24; SR-54; CW 305:3-24; CW-47].

184. The extent of area burned in the U.S. each year has increased since the 1980s. According to National Interagency Fire Center data, of the ten years with the largest acreage burned, all have occurred since 2004, including the peak year of 2021. This period coincides with many of the

warmest years on record nationwide. [SR 158:4-11; SR-52].

185. Wildfires in Montana are expected to become significantly worse in the coming years without immediate steps to reduce GHG emissions. [SR 106:1-24; CW 306:11-307:11; CW-49].

186. The effects of anthropogenic climate change, including rising temperatures, changing precipitation patterns, and drought conditions, create challenges and uncertainty for farmers. [CW 312:2-313:15].

187. Climate change affects wildlife, and some species will be [\*56] more sensitive to impacts to the climate than others. Species may adapt, move, or go extinct. For example, the American pika and Snowshoe hares are considered highly sensitive to climate change due in large part to their dependence on subalpine habitat and snow cover, which is also projected to decline. [SR-59; P72; DF 406:11-15]. Dependence on climate-sensitive habitats like seasonal streams, wetlands and vernal pools, seeps and springs, alpine and subalpine snowfield areas, grasslands and balds, is a large driver of species sensitivity. [SR 164:5-16, 165:6-166:6].

188. Rising temperatures will increase the number of freeze-free days in Montana and increase in the number of days above 90°F. [CW 273:6-20, 275:18-276:7; P6; CW-24, CW-27].

189. There will be increasing seasonal variation in Montana's precipitation, with more precipitation falling in the spring and fall and less in the winter and summer. The change in precipitation timing and a decrease in precipitation during the summer months, combined with increasing summer temperatures, will contribute to increasing risk of summer drought conditions in parts of Montana and more precipitation falling as rain as opposed to snow. [CW 281:4-21; [\*57] CW-30, CW-35; P6, P34].

190. Increasing temperature will offset small

increases in precipitation by increasing rates of evaporation and transpiration and will make late-summer and fall droughts highly likely and increasingly severe. [CW 283: 3-10].

191. The current decline in Montana snowpack and snow accumulation is projected to continue. The loss of snowpack and snow accumulation is primarily driven by increasing temperatures, which are caused by anthropogenic GHG emissions. [CW 283:11-19, 284:23-285:21, 286:9-15, 287:15-288:10, 290:20-291:9; CW-35].

192. Spring runoff in Montana is projected to increase through the 21st century because of warmer temperatures and earlier snowmelt. Increased January-April runoff will lead to increasingly low streamflow in July-September. [CW 293:8-18].

193. The science is clear that there are catastrophic harms to the natural environment of Montana and Plaintiffs and future generations of the State due to anthropogenic climate change. [SR 105:9-21, 149:15-150:7]. The degradation to Montana's environment, and the resulting harm to Plaintiffs, will Worsen if the State continues ignoring GHG emissions and climate change. [SR 105:22-106:18, 137:10-15, 168:17-169:7, [\*58] 169:19-21; CW 318:2-5, 316:17-317-14; DF 428:6-12; JS 712:8-12].

### **CLIMATE CHANGE IS ALREADY HARMING PLAINTIFFS.**

194. The unrefuted testimony established that Plaintiffs have been and will continue to be harmed by the State's disregard of GHG pollution and climate change pursuant to the MEPA Limitation.

195. Plaintiff Rikki Held lives on her family's ranch twenty miles outside of Broadus, Montana. Broadus is a ranching community in Southeastern Montana, with a population of approximately 450 people in the town and approximately 2000 in Powder River County.

a. Rikki has experienced climate change-related



harms to herself and her family ranch, including harms from flooding, severe storms, wildfires, and drought.

b. The Powder River runs through Rikki's ranch. The ranch includes five pivot fields and pine-covered hills. Rikki and her family have raised cattle on the ranch, grew crops to feed cattle, and owned horses.

c. Rikki started riding horses and herding livestock when she was four. Rikki grew up involved in ranching activities, working with livestock, haying, and fixing fences.

d. Rikki's grandparents are from Broadus and her dad grew up in Broadus.

e. Rikki and her family run a motel that [\*59] rents rooms to travelers. Rikki often works for the family motel business. The primary source of Rikki's family's income is the ranch (currently leased) and motel business. Loss of this income affects Rikki personally.

f. Impacts to the climate are already harming Rikki's home, family, community, income, and way of life.

g. Rikki was often required to work outside on the ranch regardless of the temperatures or air quality. Rikki's physical well-being has been harmed by wildfires and wildfire smoke, as well as extreme heat.

h. In 2012, the Ash Creek fire burned seventy miles of power poles, causing the loss of electricity on Rikki's ranch for a month. Electricity is required to access water for both cattle and Rikki's house on the ranch, so the loss of electricity harmed both cattle and Rikki.

i. Climate change has impacted the snowpack on the ranch in recent years, with snow typically not lasting through the winter. Reduced winter snowpack means less natural water available for cattle. As a result, the cattle must rely on water tanks, which are far apart and expensive to install.

With less water, there is also less grass available for the cattle to eat.

j. With less water and grasses, cattle [\*60] travel further for water and food, and lose weight. This means the cattle are not as valuable and the ranch profits and income declined.

k. Wildfires have closed roads around Broadus limiting the number of people that can reach Rikki's family motel business, causing lost income for Rikki and her family.

l. Climate change has caused increased variability in water levels in the Powder River. Rikki's family relies on the river to water their livestock. Increasingly, the river levels are extremely low while at other times the river floods.

m. In 2017, the Powder River flooded and eroded the riverbank on Rikki's ranch, undercutting a fifty-year-old fence. Since then, continued flooding has eroded about fifty feet of riverbank, with floodwaters that nearly reach Rikki's home.

n. Rikki experiences stress and despair from how climate change impacts her well-being, the well-being of her family, and the well-being of other Montanans. Montana is Rikki's home and seeing how climate change is impacting Montana and her family ranch is a heavy emotional burden for Rikki.

o. Rikki faces economic harm, including barriers to keeping family wealth and property intact and decreased future economic opportunities. [\*61]

196. Plaintiffs Lander Busse and Badge B. are brothers, living in Kalispell, Montana.

a. Lander and Badge enjoy hunting and fishing.

b. Lander and Badge hunt with their parents and grandparents. Hunting is an important family activity.

c. Lander and Badge's ability to hunt and fish is inhibited due to climate change consequences, including extreme heat and wildfires.

- d. Climate change has adversely impacted Lander and Badge's ability to fish by rendering certain waterways impassible by raft due to low instream levels or too-warm water temperatures, which harm fish and decrease their populations.
- e. Lander and Badge have had their ability to fish limited or foreclosed due to fishery closures as a result of climate change-induced conditions in Montana's rivers. Lander and Badge have also had their access to rivers limited for other recreational activities.
- f. The extreme temperatures and smoke have at times made hunting unbearable and impossible for Lander and Badge. Smoky conditions have also impacted their fishing activities.
- g. Due to climate change, the wildfire smoke in Kalispell, and in other parts of Montana where Badge recreates, makes it difficult for Badge to breathe and triggers a[\*62] cough, which negatively impacts his health and well-being.
- h. In 2018, a wildfire near the Busse's home forced their family to prepare to evacuate. Preparing to evacuate was a traumatic experience for Lander and Badge. Badge is worried that wildfires will continue to threaten his home.
- i. Lander has seasonal pollen allergies, which are worsening due to the increased pollen count and a changing climate.
- j. Lander is an accomplished musician and theater performer and often performs outdoors. Climate change and wildfires have hampered his ability to perform music and theater at a high level and have negatively impacted his physical well-being.
- k. Badge is named after the Badger-Two Medicine, an area where he frequently recreates and fishes. Wildfires in the Badger-Two Medicine have destroyed trees and have degraded areas important to Badge and where he enjoys visiting and recreating, which has had a powerful emotional impact on Badge. Badge experiences a sense of loss and distress knowing that the area is being damaged and degraded due to climate change. Badge feels as if a Part of him were lost in the Badger Two-Medicine fire.
- l. Badge is passionate about skiing and has skied for as long [\*63] as he can remember. Climate change is reducing Badge's ability to participate in this important recreational activity.
- m. Badge is anxious when he thinks about the future that he, and his potential children, will inherit.
- n. Lander and Badge care deeply about protecting Montana's environment, which is an integral part of their family traditions, Culture, and identity. Witnessing the current impacts of climate change in Montana is traumatic for both Lander and Badge.
- o. Lander and Badge are experiencing the loss of ties to the land in Montana.
197. Plaintiff Sariel Sandoval is a member of the Confederated Salish and Kootenai Tribes and is from Ronan, Montana.
- a. Sariel and her family have a deep connection to the natural world, and have a unique connection to the land, the natural environment, and the seasons. Climate change is harming Sariel's culture and tribal practices. Sariel went to a Salish language immersion school called Nkwusm in Arlee. At school, Sariel was taught her native language and learned about the Salish culture.
- b. Sariel was excited to receive her Salish name, which means "Person Who Brings the Cedar." Cedar has important cultural significance because it provides a connection [\*64] through the land to the Creator.
- c. Sariel feels a strong sense of connection to her community. She believes that carrying on her community's traditions is important because it is their way of life and reflects their connection to the land.
- d. Gathering and using sweet grass and bear root is

important to Sariel culturally and spiritually.

e. Sariel is concerned about how climate change affects the seasons because her culture is very ingrained with the land and the seasons. It also affects plants and foods her tribe needs to survive, and she is concerned that these changes will change the community itself. Because of earlier-than-normal snowmelt and the consequent drying of mountain streams as a result of climate change, plants used in Salish and Kootenai medicines are becoming scarcer and more difficult for tribe members to gather.

f. Coyote Stories are a culturally important type of Creation Story that can only be told when there is snow on the ground. Sariel is concerned because the snow is not staying on the ground as long, and she does not know what will happen to the stories when there is no more snow.

g. Climate change impacts Sariel's ability to partake in cultural and spiritual [\*65] activities and traditions, which are central to her individual dignity. Climate change has disrupted tribal spiritual practices and longstanding rhythms of tribal life by changing the timing of natural events like bird migrations.

h. Sariel worked at Blue Bay Campground the summer after she graduated high school. Sariel lost a few weeks of work and income due to the nearby Finley Point fire (also known as the Boulder 2700 Fire) in 2021. The fire also led to the road being shut down, homes being lost, and people being evacuated.

i. Sariel is often unable to see the mountains near her home due to wildfire smoke.

j. Berry picking is a staple cultural activity for Sariel and her family. Some huckleberry bushes are not producing fruit because of drought and Sariel must travel higher up into the mountains to find healthy huckleberries.

k. Climate change has a profound emotional impact on Sariel, who experiences stress and despair about

the impacts her community is facing due to climate change.

I. Sariel was greatly distressed when she learned that Montana was almost at the point of no return with respect to climate change.

198. Plaintiff Kian Tanner lives on his family's property in Bigfork, Montana. [\*66]

a. Kian's property has been degraded by wildfire smoke.

b. Kian is a passionate fly fisher and has fished with his dad since he was about four years old. Kian hopes he will be able to preserve this tradition and fish for the next fifty years or more.

c. The warmer water temperatures, lower oxygen levels, and declining instream flows due to climate disruption are harming Montana's rivers and fish. These climate impacts have decreased fishing opportunities for Kian as he has had to cancel fishing trips due to wildfires. Not being able to fish is devastating for Kian.

d. Kian lives near and enjoys visiting and recreating in Glacier National Park, which is a very special place for Kian. He is distressed he will never be able to see the natural glaciers as they have historically existed, and as other generations experienced them.

e. Kian enjoys downhill and cross-country skiing, which is an activity he does with his mom, who taught him to ski. Kian cross-country skis on his family's property. Impacts to the climate have reduced his opportunities to downhill and cross-country ski.

f. Increased smoke in the summer has harmed Kian's ability to play soccer, fish, and otherwise recreate outside, activities [\*67] which are crucial for his emotional health and foundational to his family. Kian's soccer practices have been cancelled due to heat and wildfire smoke.

g. The smoke often forces Kian to seek refuge

indoors, which makes him feel very claustrophobic.

h. Kian's fears about impacts to the climate take an emotional toll on him and he feels a heavy burden to carry the mantle of the generation that must address climate change.

199. Plaintiff Georgianna Fischer (Georgi) is from Bozeman, Montana.

a. Georgi's family has lived in Montana for generations. Georgi's great grandmother, Mary "Polly" Wisner Renne, is someone that Georgi admires because of her work to protect Montana's environment. Renne was a key figure in establishing protections for the Lee Metcalf Wilderness Area.

b. Georgi is a competitive Nordic skier. She has competed on the national level, including Junior National Championships, U.S. National Championships, and the 2021 NCAA competition. She trains eleven months of the year, six days a week. Georgi's ability to compete and participate in Nordic skiing has been directly impacted by climate disruption. Declining winter snowpack has inhibited Georgi's ability to complete necessary and [\*68] appropriate training and hinders her ability to continue to compete at a high level, which adversely impacts her health and mental well-being.

c. In recent years there has not been enough snow to groom trails or create tracks in the snow to Nordic ski race until January, although historically tracks were created in November.

d. Georgi's summer Nordic skiing training has been impacted by wildfires and wildfire smoke. Practices have been cancelled or curtailed due to smoke and the smoke prevents Georgi from training at a high intensity. Georgi is increasingly worried about the long-term effects that the exposure to heavy wildfire smoke while training has on her health and respiratory system. Extreme heat also harms Georgi and her ability to recreate and train outdoors. The heat has caused her to feel dizzy, nauseous,

generally unwell, and has caused persistent nosebleeds that led Georgi to seek medical attention.

e. Georgi enjoys paddleboarding, rafting, backpacking, hiking, and other outdoor activities. Georgi's recreation on Montana's rivers has been impaired due to low water levels and stream flows. Georgi and her family have had to cancel river rafting trips, including one on the Smith [\*69] River, due to low stream flow.

f. Georgi experiences feelings of despair and hopelessness because of the declining winter snowpack and what that trend entails for her snow-based sport.

200. Kathryn Gibson-Snyder (Grace) is from Missoula, Montana.

a. Grace's recreation on Montana's rivers and streams has been affected due to both low water levels and flooding conditions. Because of climate change, Grace's access to the Clark Fork River for recreational activities has been increasingly impaired, limiting her ability to enjoy activities important to her health and family.

b. Grace enjoys many outdoor activities, including long-distance biking, hiking, soccer, and kayaking.

c. Grace has been harmed by wildfire smoke and extreme heat; which have adversely impacted her ability to play competitive soccer. Smoke and heat have led to fewer soccer practices and the cancellation of games. Wildfires have impacted Grace's ability to go outside, enjoy outdoor activities, and have placed her safety, health, and well-being at risk.

d. One of Grace's environmental community education events was cancelled due to wildfire smoke.

e. Grace has had hiking activities impacted by wildfire smoke.

f. Grace experiences [\*70] psychological harms, is

distressed from day-to-day climate conditions, and is anxious about climate change. It is devastating for Grace to think that Montana's special landscapes, like Glacier National Park's glaciers, will not exist as they have in the past, or at all, when she is older.

g. Even though Grace would like to raise children in Montana, she questions whether she can morally bring children into the world, because of her knowledge and fear of the world that her children would grow up in if climate change is not ameliorated.

201. Plaintiff Olivia Vesovich is from Missoula, Montana.

a. Olivia has exercise-induced asthma and is therefore particularly vulnerable to smoke-filled air. In smoky conditions, Olivia feels she is suffocating if she spends more than thirty minutes outdoors. During smoky conditions, Olivia is forced to stay inside and reduce or eliminate the outdoor activities she enjoys. Olivia has been forced to spend recent summers away from Montana due to the smoke-filled air and her asthma.

b. Olivia suffers from spring pollen allergies, which force her to stay indoors and prevent her from engaging in the recreational activities she enjoys. Olivia's spring allergies [\*71] cause her eyes to swell shut and cause eye pain for weeks at a time. Olivia's allergies have become progressively worse in recent years.

c. Olivia is affected emotionally and psychologically by climate change, and experiences bouts of depression when she thinks about the dire projections of the future. Olivia would like to have children of her own, but she questions whether this is an option in a world devastated by the effects of climate change.

d. Olivia experiences psychological harms and is distressed from day-to-day climate conditions and is anxious about climate change. There are days

when Olivia feels paralyzed by the impacts and threats of climate change and she fears that it is too late to address climate change.

e. For Olivia, climate anxiety is like an elephant sitting on her chest and it feels like a crushing weight. This climate anxiety makes it hard for her to breathe.

202. Plaintiff Claire Vlases is from Bozeman, Montana.

a. Claire works as a ski instructor at Big Sky Resort, and her ability to earn money is harmed by climate disruption, which is decreasing Montana's winter snowpack and the number of days Claire can work. Claire has been sent home from her job as a ski instructor [\*72] without working her scheduled shift, and without pay, because of insufficient snow. Claire relies on her income as a ski instructor, so the lost income is a financial hardship for her.

b. Claire regularly visits Glacier National Park where she loves to hike. Seeing the loss of glaciers in Glacier National Park is terrifying for Claire and reduces her enjoyment of the park. Claire's ability to enjoy hiking in Glacier National Park has also been diminished due to increasing wildfire smoke, which obstructs the beautiful views and is harmful to her health.

c. Claire has been harmed by the reduced snowpack in Montana and the related impacts to winter sports and tourism.

d. Claire's ability to run cross-country has been harmed by extreme heat and wildfire smoke. Claire has had cross-country practices cancelled due to dangerously smoky air quality conditions. The heat and smoke make it difficult for Claire to train and compete.

e. Claire's family has water rights to Bozeman Creek. Claire and her family use the water for drinking, plumbing, watering their garden, and all other water needs at their home.

f. Claire's water security is threatened by Montana's melting glaciers, declining snowpack, [\*73] and increasing summer drought conditions, which lead to water scarcity and low water levels in Bozeman Creek.

g. As an individual born with a disability, Claire relies on the outdoors for recreational therapy to replace the physical therapy her insurance stopped providing when she was ten years old. The outdoors helped Claire to grow strong and she continues to rely on activities like skiing, biking, hiking, and running to maintain her physical health. Claire depends on a clean and healthful environment for her physical and mental health and well-being.

h. Climate change impacts harm Claire's mental health, causing her to feel stress, anxiety, and a sense of helplessness about the future.

203. Plaintiff Taleah Hernandez is from Polson, Montana, and lives on the Flathead Indian Reservation.

a. Taleah has been forced to remain inside for extended periods of time during the summer because of poor air quality caused by excessive wildfire smoke. Wildfires have caused Taleah to lose electricity at her home and forced her to prepare to evacuate her home. The Boulder 2700 fire in 2021, forced Taleah to cut down trees around her property for fire safety.

b. Taleah works outdoors with horses and [\*74] other animals. Dangerous air quality conditions created by wildfire smoke have caused Taleah to miss days of work, lose pay, and lose opportunities to ride horses.

c. Wildfires and wildfire smoke have prevented Taleah from participating in outdoor recreation activities, including hiking and paddleboarding on Flathead Lake.

d. Changes in weather and climate patterns, including warming winter temperatures, have reduced the number of opportunities Taleah has to

ice skate on Flathead Lake in the winter.

e. Wildfires and wildfire smoke have caused Taleah physical and emotional distress.

204. Plaintiff Eva L. is from Livingston, Montana.

a. Eva enjoys many outdoor activities, including backpacking, climbing, and cycling, which are central to her family life.

b. Eva has been harmed by wildfire smoke in Montana on numerous occasions, and Eva has suffered eye, nose, and throat irritation and headaches because of the smoky air.

c. Eva and her family had a family trip to Glacier National Park negatively impacted by excessive wildfire smoke, which posed risks to Eva's health and safety.

d. Eva has been harmed by the impacts of extreme flooding. In 2018, flooding along the Shields River damaged a bridge [\*75] and rendered impassable for more than a year the primary route from Eva's home to the town of Livingston. A temporary bridge was also washed away due to extreme flooding. Eva's family eventually decided to relocate because of this hardship. Being cut off from town was very stressful for Eva and her family.

e. Eva moved to Livingston and now lives near the Yellowstone River. Eva feels a strong connection to the river. In 2022, there was major flooding along the Yellowstone River, including in Livingston. [CW-41; JS-11]. Eva helped fill sandbags to hold back the flood waters. [P108, P109]. A park near Eva's home was underwater. [P110]. Eva saw her community and close friends lose property due to flooding.

f. The 2022 flooding in Livingston caused Eva acute emotional distress, panic, and dread. Parks and other public places she often visits were significantly damaged, preventing her enjoyment of them.

- g. Eva's access to the Yellowstone River in summer 2016 was significantly curtailed, as a 180-mile portion of the river was closed for several weeks due to a parasite growth in cutthroat and rainbow trout perpetuated by abnormally high air temperatures and historically low river flows.
- h. Eva [\*76] has experienced forced relocation and the loss of ties to the land.
- i. Eva has had her ability to access Montana's rivers for other recreational activities limited due to river conditions.
- j. Wildfire smoke has impacted Eva's ability to hike and spend time outdoors with her family.
- k. Eva is anxious about how she, her family and community can adapt to the devastation of public resources and infrastructure as the impacts of climate change worsen. Eva is increasingly anxious about the climate change impacts she and her family are experiencing. She is distressed that climate change will worsen if action is not immediately taken.
205. Plaintiff Mica K. is from Missoula, Montana.
- a. Rising temperatures and wildfires resulting from climate change make it difficult for Mica to recreate outdoors and participate in activities he loves, and which are important to his health and well-being.
- b. Mica has been forced to spend extended periods of time indoors and has lost school recess time because of wildfire smoke. In 2019, a forest fire started approximately one mile from Mica's home, and Mica is anxious that, as climate change worsens, he may lose his family home.
- c. Wildfire smoke has impacted Mica's [\*77] training as a long-distance runner. Mica is an avid runner, running his first half-marathon when he was nine. He runs regularly with his dad. Running is a way for Mica to be in nature and relieve stress. Running in smoke makes Mica feel sick, so he cannot run as much due to increasingly smoky summers in Missoula. Smoke has limited Mica's ability to train and compete in sports.
- d. Mica gets frustrated when he is required to stay indoors during the summer because of wildfire smoke.
- e. Mica's family now avoids camping and other outdoor activities in August and September due to wildfire smoke and its negative effect on Mica's health.
- f. Mica was recently diagnosed with exercise-induced asthma, which puts him at greater risk for respiratory hardship when the air is smoky.
- g. Mica's favorite animal is the pika. Mica understands the pika is uniquely vulnerable to climate impacts, and its survival is in jeopardy due to climate change.
- h. Mica's outdoor recreation activities such as enjoying the views of glaciers in Glacier National Park are disrupted by climate change. Seeing the glaciers recede in Glacier National Park is depressing for Mica.
- i. Climate change causes Mica to feel anxious, stressed, [\*78] and depressed, and makes it hard for him to sleep at times.
206. Plaintiffs Jeffrey K. and Nathaniel K. are brothers who grew up in Montana City, Montana.
- a. Jeffrey K. has pulmonary sequestration and is uniquely susceptible to respiratory complications, such as infections. Nathaniel K. also has respiratory issues. Both Jeffrey and Nate are therefore especially vulnerable to poor air quality, such as smoke-filled air caused by wildfires. [LB 487:21-488:11, 505 :4-25].
- b. The increasing length and severity of the wildfire season harms Jeffrey's and Nathaniel's health, especially given their young age and pre-existing respiratory health conditions. It has forced their family to make changes in daily activities. [LB 487:21-488:11, 505:4-25].

207. Plaintiffs Ruby D. and Lilian D. are from Bozeman, Montana. Shane Doyle is their father and he testified on their behalf.

a. Ruby and Lilian are members of the Crow Nation. Ruby and Lilian regularly travel to the Crow Reservation to visit family members and engage in traditional cultural activities.

b. Ruby's Crow name is Biachagata, which means "Pretty Woman." Lilian's Crow name is Malesch, which means "Loved by Many."

c. Abnormal and extreme weather [\*79] conditions caused by climate change have impacted Ruby's and Lilian's ability to engage and otherwise partake in cultural practices that are central to their spirituality and individual dignity.

d. Ruby and Lilian visit their family on the Crow Reservation several times a year. Ruby and Lilian attend Crow Fair on the Crow Reservation every year. Crow Fair takes place each August and is a large gathering to celebrate cultural activities and events. Many people, including Ruby and Lilian, stay in teepees. Attending Crow Fair is a highlight for Ruby and Lilian. Ruby and Lilian love dancing at Crow Fair, and enjoy the parades, the rodeo, and doing family events.

e. In recent years, increasing temperatures at Crow Fair have made it hard to wear traditional regalia and participate in cultural activities because it is dangerously hot, sometimes over 100 degrees.

f. Wildfire smoke has also made it difficult for Ruby and Lilian to enjoy the Crow Fair.

g. It is a huge disappointment to Ruby and Lilian when they are unable to dance or participate in other events at the Crow Fair due to heat or smoke.

h. Crow Fair used to coincide with when chokecherries were ripe, which was important because many [\*80] meals eaten at Crow Fair involved chokecherries. In recent years chokecherry harvest has become much harder to predict, and drought has meant there are less

chokecherries available for the festival.

i. Ruby and Lilian pick chokecherries with their family as part of the Crow tradition. They enjoy participating in the process of picking the berries, processing them into syrup, and eating them. But due to drought and heat, fewer chokecherries are available and some stands that usually have berries had none. Increased wildfire frequency has impacted the ability of Ruby and Lilian to participate in these traditional cultural practices.

j. Ruby was diagnosed with asthma when she was eight years old and had an acute form of pneumonia. As a result, Ruby stays inside when it is smoky, and Lilian often stays inside too. This is a disappointment for Ruby and Lilian.

k. During the Bridger fire, which burned near Bozeman in 2020, Ruby and Lilian were worried to see a fire so close to their home and it brought up concerns about whether they were safe.

l. Climate disruption has impacted Ruby and Lilian's outdoor recreation activities, such as rafting, swimming, and floating. Drought has created low river [\*81] conditions that have impacted Ruby and Lilian's ability to enjoy recreating on the river because it has such low flow.

m. Ruby and Lilian believe that protecting Montana's environment and natural resources is important because in their culture taking care of the Earth is their responsibility.

208. The testimony of the Youth Plaintiffs and their guardian was credible and was undisputed.

## **VI. DEFENDANTS' ACTIONS CONTRIBUTE TO CLIMATE CHANGE AND HARM PLAINTIFFS.**

209. Anne Hedges received a B.S. in environmental policy analysis and planning from the University of California at Davis in 1988 and a Master of Environmental Law, *magna cum laude*, from Vermont Law School in 1993. She is Co-Director



and Director of Policy and Legislative Affairs at the Montana Environmental Information Center (MEIC). She directs MEIC's program work, including its legislative, regulatory, policy, and legal activities. She has worked at MEIC since 1993, and her work is focused on pollution-related policy issues in Montana, with a primary emphasis on impacts to air, water, landscapes, and climate from fossil fuels. Ms. Hedges is a well-qualified expert, and the Court found her testimony informative and credible.

210. [\*82] Peter Erickson received a bachelor's degree in Geology in 1998 at Carleton College, Minnesota, as well as coursework in intermediate microeconomics and macroeconomics at the University of Washington. Mr. Erickson has worked as an environmental and climate policy and technical analyst in greenhouse gas emission accounting, most recently with the Stockholm Environment Institute, an international research institution providing, in part, technical analysis to government and NGOs on the details of climate policy and emissions accounting. Mr. Erickson has served on both national and international committees devoted to GHG emissions accounting: one convened by the International Council of Local Environmental Initiatives (ICLEI) to create a U.S. Community-scale GHG Emissions Accounting and Reporting Standard, and one convened by the Greenhouse Gas Protocol to create the Greenhouse Gas Mitigation Goals Standard. [P192]. Mr. Erickson testified about Montana's fossil fuel consumption, extraction, and infrastructure, focusing on three categories: (1) extraction of fossil fuels; (2) processing and transportation of fossil fuels; and (3) consumption of fossil fuels by end users. For each of these [\*83] categories, Mr. Erickson quantified the amount of coal, oil, and gas and translated that in units of carbon dioxide (CO<sub>2</sub>) emissions released from the fuels once they are combusted. Mr. Erickson added up all the coal, oil, and gas to determine the emissions associated with the extraction, consumption, and transportation of those fuels. In his opinion, emissions from Montana's fossil fuel consumption, extraction, and

infrastructure are globally significant quantities. Mr. Erickson is a well-qualified expert, and the Court found his testimony informative and credible.

211. Defendants offered the testimony of Dr. Terry Anderson as an expert economist. Purporting to be based on data from the Energy Information Agency (EIA), Dr. Anderson provided extremely limited testimony in response three questions: (1) the total greenhouse gas emissions for the world; (2) the 2020 greenhouse gas consumption emissions for the state of Montana; and (3) the 2022 greenhouse gas consumption emissions for the state of Montana. Dr. Anderson's testimony was not well-supported, contained errors, and was not given weight by the Court.

212. Defendants permit three types of fossil fuel-related activities: (1) extraction [\*84] of fossil fuels; (2) processing and transportation of fossil fuels; and (3) consumption of fossil fuels by end users. [PE 914:12-915:3; PE-9].

213. Fossil fuel consumption includes any combustion, or burning, of these fuels, primarily for energy. Fossil fuel extraction is mining, pumping, drilling, or otherwise taking fossil fuels out of the ground for purposes of making fuels. Fossil fuel processing and transportation are activities that occur between that initial extraction and combustion by the end user, such as refining, or moving the fuels in bulk from one place to another. [PE 914:14-21; PE-11].

214. It is possible to calculate the amount of CO<sub>2</sub> and GHG emissions that results from fossil fuel extraction, processing and transportation, and consumption activities that are authorized by Defendants. [PE 915:13-21; P311; PE-10].

215. Data indicates that in 2019, the total annual fossil fuels extracted in Montana led to about 70 million tons of CO<sub>2</sub> being released into the atmosphere once the fuels were combusted, which is higher than many other countries, including Brazil, Japan, Mexico, Spain, or the United Kingdom. [PE 922:23-923:3, 928:18-929:11,

950:13-14; PE-17].

216. Data indicates [\*85] that in 2019, total annual fossil fuels consumed in Montana led to about 32 million tons of CO<sub>2</sub> being released into the Atmosphere.

217. In 2019, total annual fossil fuels transported and processed in and through Montana led to at least 80 million tons of CO<sub>2</sub> being released into the atmosphere once those fuels were combusted. [PE 923:19-924:4, 950:14-15]. That is equivalent to all the GHG emissions from Columbia, which has 50 times the population of Montana. [PE 930:11-23; PE-17, PE-20].

218. Accounting for overlap among fossil fuels extracted, consumed, processed, and transported in Montana, the total CO<sub>2</sub> emissions due to Montana's fossil fuel-based economy is about 166 million tons CO<sub>2</sub>. [PE 924:5-18, 950:16-18; PE-18]. This is a conservative estimate and does not include all the GHG emissions, including methane, for which Montana is responsible. [PE 928:5-9; PE-17].

219. The 166 million tons CO<sub>2</sub> due to Montana's fossil fuel-based economy is equivalent to the emissions from Argentina (with forty-seven million residents), the Netherlands (with eighteen million residents), or Pakistan (with 248 million residents). [PE 931:22-932:9; PE-22].

220. In terms of per capita emissions, Montana's [\*86] consumption of fossil fuels is disproportionately large and only five states have greater per capita emissions. [PE 930:19-23, 938:23-25; PE-25].

221. The cumulative CO<sub>2</sub> emissions from all fossil fuels extracted in Montana since 1960 is 3.7 billion metric tons of CO<sub>2</sub>. [PE 941:9-19; PE-26].

222. Montana is a major emitter of GHG emissions in the world in absolute terms, in per person terms, and historically. [PE 930:19-23].

223. Montana has six coal mines that Defendants authorize: Spring Creek Mine, Rosebud Mine,

Decker Mine, Absaloka, Bull Mountain, and Savage Mine. [PE 942:16-943:5]. Montana also has the largest estimated recoverable coal reserves in the U.S., and Montana is a substantial exporter of coal. [AH 791:1-25; AH-7-AH-13; PE 946:1-3].

224. Montana's annual coal production is 34 million short tons of coal. [PE 946:5-22]. Montana's coal reserves, as of 2019, are 707 million short tons. [PE 945 :21-25; PE-37] .

225. Montana is a substantial producer of oil and gas in the U.S. Defendants authorize the drilling and production of oil and gas in Montana. [PE 932:18-933:5, 949:7-15].

226. Montana has approximately 4,000 oil producing wells with an annual oil production of twenty-three [\*87] million barrels. As of 2019, Montana's oil reserves were 298 million barrels. [PE 946:23-947:8; PE-36, PE-37].

227. Montana has approximately 5,000 gas producing wells with an annual oil production of forty-three billion cubic feet. As of 2019, Montana's gas reserves were 613 billion cubic feet. [PE 947:14-19; PE-36, PE-37].

228. Between 1960 and 2019 the fastest growing category of fossil fuel consumption in Montana has been gas. [PE 942:11-12].

229. Montana is home to four state-authorized oil refineries. [PE 948:22-24, 949:10-15]. Montana's refineries process crude oil largely from Canada and Wyoming and distribute the refined product by railroad and pipeline throughout Montana and to nearby states. [PE 948:17-949:23; PE-38].

230. Montana's land contains a significant quantity of fossil fuels yet to be extracted. [Def. Answer, Doc. 54 ¶ 139; PE 945:21-946:4, 947:16-19, 945:1-25].

231. Montana's GHG emissions have grown significantly since the passage of the 1972 Montana Constitution. [AH 940:15-941:2; PE-27, PE-28].

232. Defendants continue to approve permits and licenses for new fossil fuel activities. [AH 862:1-5; SN 1354:12-16].

233. Defendants have authorized fossil fuel extraction, [\*88] transportation, and combustion resulting in high levels of GHG emissions that contribute to climate change. [AH 831:22-832:1, 846:25-847:11, 845:14-846:3; AH-50-AH-61; PE 932:18-933:5].

234. In taking action to authorize fossil fuel extraction, since 2011 Defendants have not considered or disclosed GHG or climate change impacts in their environmental reviews because they were statutorily precluded from doing so. [AH 836:2-13, 845:14-846:3; AH-50-AH-61].

235. DEQ issues air quality permits to facilities that emit GHG emissions. [AH 788:13-23; Def. Answer, Doc. 11 ¶ 90].

236. DEQ has authorized fossil fuel extraction, transportation, and combustion, which generate GHG emissions, contribute to climate change, and harm Plaintiffs. [AH 845:14-846:24; AH-50-AH-61].

237. What happens in Montana has a real impact on fossil fuel energy systems, CO<sub>2</sub> emissions, and global warming. [PE 976:8-24; PE-40].

## VII. THE MEPA LIMITATION AND ITS IMPLEMENTATION.

238. The 2011 MEPA Limitation provided in pertinent part:

(2)(a) Except as provided in subsection (2)(b), an environmental review conducted pursuant to subsection (1) may not include a review of actual or potential impacts beyond Montana's borders. It may not include actual or potential [\*89] impacts that are regional, national, or global in nature.

239. While this case has been pending, Judge

Moses held in *MEIC v. DEQ*:

Here, the plain language of [MCA 75-1-201\(2\)\(a\)](#) precludes agency MEPA review of environmental impacts that are 'beyond Montana's borders,' but it does not absolve DEQ of its MEPA obligation to evaluate a project's environmental impacts within Montana. DEQ misinterprets the statute. They must take a hard look at the greenhouse gas effects of this project as it relates to the impacts within the Montana borders.

Order on Summary Judgment at 29:3-9, *MEIC v. DEQ*, No. DV-56-2021-1307 (Thirteenth Dist. Ct., April 6, 2023).

240. Eight days after Judge Moses' ruling, on April 14, 2023, HB 971 was introduced in the Montana Legislature. HB 971 was passed, sent to enrolling on May 1 and signed by the Governor on May 10, 2023. HB 971 clarifies the MEPA Limitation to say:

(2)(a) Except as provided in subsection (2)(b), an environmental review conducted pursuant to subsection (1) may not include an evaluation of greenhouse gas emissions and corresponding impacts to the climate in the state or beyond the state's borders.

(b) An environmental review conducted pursuant to subsection (1) may include an evaluation if:

(i) conducted jointly by a state agency and a federal agency to the extent the review is required [\*90] by the federal agency; or

(ii) the United States congress amends the federal Clean Air Act to include carbon dioxide emissions as a regulated pollutant.

[Mont. Code Ann. § 75-1-201\(2\)\(a\)](#) (enacted May 10, 2023) (new language underlined).

241. On May 19, 2023, various provisions of MEPA that pertain to legal challenges to MEPA

environmental reviews were amended when the Governor signed SB 557 into law. SB 557 created Mont. Code Ann. § 75.-1-201(6)(a)(ii), which states:

(ii) An action alleging noncompliance or inadequate compliance with a requirement of parts 1 through 3, including a challenge to an agency's decision that an environmental review is not required or a claim that the environmental review was inadequate based in whole or in part upon greenhouse gas emissions and impacts to the climate in Montana or beyond Montana's borders, cannot vacate, void, or delay a lease, permit, license, certificate, authorization, or other entitlement or authority unless the review is required by a federal agency or the United States congress amends the federal Clean Air Act to include carbon dioxide as a regulated pollutant.

[Mont. Code Ann. § 75-1-201\(6\)\(a\)\(ii\)](#) (enacted by SB 557, 68th Legislature (2023)) (signed May 19, 2023).

242. Other components of SB 557 limit who can challenge an agency's final decision, the scope of the challenge, [\*91] and require challengers to pay a fee to compile and submit a certified record to the reviewing court. [AH 825:4-826:18; AH-45].

243. Both the 2011 and 2023 versions of the MEPA Limitation allowed Projects to be permitted without consideration of their impacts that increase emissions of greenhouse gases. [AH 851:9-852:23; AH-51-AH-60].

244. The State has known of the dangerous impacts of GHG emissions and climate change for at least the last thirty years. [CW 256:6-15; AH 802:13-18; AH-25, AH-26; P17, P19].

245. State government and scientists have known about the international scientific consensus of the dangers posed by climate change since at least the 1990s when the IPCC started issuing climate assessment reports. The State also had access to the congressionally mandated national climate

assessments undertaken in 2000, 2009, 2014, and 2017. [SR 139:12-140:1; AH 797:5-798:6, 802:13-18; CW 256:9-24; AH-32, AH-33, AH-34; P28, P262, P263].

246. In 2007, Defendants DNRC, DEQ, and the Office of the Governor were made aware of the issues concerning the impacts of climate change in Montana, including rising temperatures, accelerating warming, and reduced snowpack, and the need for Montana to [\*92] reduce its GHG emissions, as a result of the 2007 Montana Climate Change Action Plan and the 2007 Montana Greenhouse Gas Inventory and Reference Case Projections 1990-2020. [CW 243:14-244:3, 256:19-24; CW-12, CW-13, CW-14; AH 806:17-807:20; AH-35, AH-36, AH-37; P2, P18].

247. In 2017, Defendants DNRC, DEQ, and the Office of the Governor were again informed by the 2017 Montana Climate Assessment of the issues concerning the impacts of climate change in Montana. [CW 243:14-244:3; AH 832:12-24; AH-49; P6].

248. In 2019, when then Governor Steve Bullock promulgated Executive Order No. 8-2019 creating the Montana Climate Solutions Council, Defendants knew that "climate change poses a serious threat to Montana's natural resources, public health, communities, and economy," and "Montanans understand that climate change is occurring and are concerned about the impacts it will have on current and future generations." [AH 832:25-833:6; AH-49; P10].

249. In August 2020, when the Montana Climate Solutions Council released its final report, the Montana Climate Solutions Plan (Climate Solutions Plan), the State knew how climate change was already harming Montana and its residents, through rising temperatures, [\*93] early snowmelt, earlier spring runoff, flooding, changes in water availability and stream temperatures, increase in forest mortality due to insects, and increasing wildfires. [CW 244: 7-22; AH 833:7-835:10; AH-49; P36].

250. The Climate Solutions Plan included thirty-seven recommendations and strategies to reduce Montana's GHG emissions. [AH 833:7-835:10; AH-49; P36]. Defendants have not implemented the recommendations. [AH 835:8-10].
251. In 2021, the report Climate Change and Human Health in Montana was distributed to State officials. [CW 245:2-246-1].
252. Prior to 2011, Defendants were quantifying and disclosing GHG emissions and climate impacts from fossil fuel projects, including, for example, the Silver Bow Generation Project, the Roundup Power Project (Bull Mountain), and the Highwood Generating Station. [AH 808:10-19, 808:20-809:18, 809:19-810:24, 811:8-24, 813:6-23; AH-38, AH-39, AH-40; P231, P224, P232, P225, P226, P229, P237].
253. Since 2011, because of the MEPA Limitation, Defendants have been statutorily prevented from considering climate change impacts and GHG emissions when conducting environmental reviews. [AH 814:6-21, 816:17-817:14, 818:11-819:10; SN 1361:6-9; AH-42]. [\*94]
254. The MEPA Limitation explicitly prohibits state agencies from considering the impacts of climate change and GHG emissions in environmental reviews under MEPA. [AH 814:22-815:9, 816:17-817:14, 818:11-819:10; SN 1361:6-9; AH-42].
255. Pursuant to the MEPA Limitation, the State has ignored GHG emissions and climate impacts when authorizing fossil fuels activities. [AH 814:22-815:9, 816:17-817:14, 818:11-819:10; AH-51-AH-60].
256. The MEPA Limitation constrains Defendants from making fully informed decisions through their environmental analysis about the scope and scale of the impacts to the environment and Montana's children and youth when conducting environmental reviews. Mont. Code Ann. § 75-1-201(6)(a)(ii) attempts to constrain the authority of courts when reviewing agency permitting decisions and MEPA analyses.
257. If the MEPA Limitation is declared unconstitutional, state agencies will be capable of considering GHG emissions and the impacts of projects on climate change. [AH 807:23-808:19, 821:16-25; SN 1437:4-8; P231, P224, P232, P225, P226, P229, P237].
258. Montana's river and lake ecosystems are interconnected with each other, as well as aquatic and terrestrial ecosystems beyond Montana's borders. Because of this [\*95] interconnectivity to ecosystems both within and beyond Montana's borders, any prohibition on the consideration of either impacts within Montana or regional impacts of climate change, is not scientifically supported. [JS 642:23-15, 646:2-647:2].
259. Defendants' application of the MEPA Limitation during environmental review of fossil fuel and GHG-emitting projects, prevents the availability of vital information that would allow Defendants to comply with the Montana Constitution and prevent the infringement of Plaintiffs' rights. [AH 810:13-24, 816:9-16, 820:16-821:11, 822:1-823:10; AH-51-AH-60].
260. The State authorizes energy projects and facilities within Montana that emit substantial levels of GHG pollution, including, but not limited to, projects that burn and promote the use of fossil fuels, but pursuant to the MEPA Limitation, Defendants do not consider climate change and GHG emissions and measure those individual and cumulative emissions against the standards the Montana Constitution imposes on the State to protect people's rights, before authorizing energy projects and facilities. [AH 818:25-819:10, 824:8-825:3; AH-51-AH-60].
261. The State issues permits, licenses, and leases [\*96] that result in GHG emissions without considering how the additional GHG emissions will contribute to climate change or be consistent with the standards the Montana Constitution imposes on

the State to protect people's rights. [AH 832:2-11, 841:23-844:9, 843:1-844:5, 844:19-846:3; AH-51-AH-60].

262. The State authorizes four private coal power plants to operate in the State, which generate 30% of Montana's energy production, without considering how the additional GHG emissions will contribute to climate change or be consistent with the standards the Montana Constitution imposes on the State to protect people's rights. [AH 792:1-21].

263. The State continues to permit surface coal mining and reclamation in Montana, which results in substantial GHG emissions, without considering how the additional GHG emissions will contribute to climate change or be consistent with the standards the Montana Constitution imposes on the State to protect people's rights. [AH 836:16-846:3; PE 934:14-15].

264. The State authorizes, through licenses and leases, the exploration for and extraction of oil and gas in Montana, without considering how the additional GHG emissions will contribute to climate change or [\*97] be consistent with the standards the Montana Constitution imposes on the State to protect people's rights. [AH 793:6-18, 845:20-846:9].

265. Defendants have and continue to authorize projects, activities, and plans that cause emissions of GHG pollution into the atmosphere, all while ignoring the impacts of climate change and GHG emissions due to the MIEPA Limitation. [AH 836:16-846:3; AH-51-AH-60; PE 932:18-933:5]. For example:

a. Defendants authorize and certify energy projects and facilities within the State of Montana that emit substantial levels of GHG pollution, including, but not limited to, projects that burn and promote the use of fossil fuels. [AH 836:16-846:3; PE 932:18-933:5].

b. DEQ approved the AM4 expansion of Rosebud Strip Mine in December 2015, a 12.1-million-ton

coal mine expansion. Pursuant to the MEPA Limitation, DEQ refused to analyze how that decision would aggravate climate impacts. [AH 836:16-837:12; P259, P260, P277; AH-51].

c. DEQ issued a MSUMRA permit to Bull Mountain Mine in January 2016, authorizing Bull Mountain Mine to produce 176 million tons of coal per year. DEQ refused, pursuant to the MEPA Limitation, to analyze how the decision would aggravate climate [\*98] impacts. [AH 837:14-838:16; P243, P264; AH-52].

d. Between 2002 and 2014, DEQ issued twelve different permits for Signal Peak Energy to operate the Bull Mountain Mine. Since 2011, pursuant to the MEPA Limitation, DEQ refused, in its environmental assessments to consider how those GHG emissions would contribute to climate change or adversely impact Montana's environment and natural resources. [P245, P247, P256].

e. DEQ approved the TR3 expansion of Decker Mine in 2018, allowing for strip-mining of twenty-three million tons of coal. DEQ refused, pursuant to the MEPA Limitation, to analyze how that decision would aggravate climate impacts. [P236, P238, P250, P252, P257-258]

f. In 2020, DEQ approved revision to Spring Creek Mine, the largest coal mine in the State, allowing for recovery of additional seventy-two million tons of coal. In August 2019, DEQ refused, pursuant to the MEPA Limitation, to analyze impacts on the social cost of carbon and economic impacts from climate change in its EIS. [AH 841:23-842:20; P227, P248, P253, 1255; AH-56].

g. DEQ authorized the operation of Colstrip Steam Electric Station—which produced 13.2 million metric tons of carbon dioxide equivalent (CO<sub>2</sub>e), 38,015 [\*99] metric tons methane, and 65,919 metric tons nitrous oxide in 2018. CO<sub>2</sub>e is a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP). [P281, P285, P286].

h. In 2019, when DEQ issued its Record of Decision approving Western Energy's permit application to expand coal mining at Rosebud Coal Mine Area F, where "[t]he proposed mine permit application would add 6,746 acres and approximately 70.8 million tons of recoverable coal reserves to the Rosebud Mine, extending the operational life of the mine by eight Years (at the current rate of production)." DEQ, pursuant to the MEPA Limitation, did not consider how those GHG emissions would contribute to climate change or adversely impact Montana's environment and natural resources. [AH 830:25-840:16; SN 1322:21-1323:2; P254, P277, P297; AH-54].

i. DEQ issued the air quality permit to NorthWestern Energy for the Laurel Generating Station (now named the Yellowstone County Generating Station), a proposed gas-fired power plant. Pursuant to the MEPA Limitation, DEQ, in its environmental assessment, did not consider how the GHG emissions would contribute to climate change or adversely [\*100] impact Montana's environment and natural resources. [AH 831:9-21, 844:19-845:13; P294; AH-57].

j. In May 2022, DEQ issued its Final EIS for Rosebud Mine Area B AM5, in Colstrip. Pursuant to the MEPA Limitation, the environmental assessment did not consider how GHG emissions would contribute to climate change or adversely impact Montana's environment and natural resources. [AH 840:20-841:22; P228; AH-55].

k. DEQ continues to issue permits for fossil fuel energy projects, including oil and gas pipelines and associated compressor stations, coal mines and coal facilities, oil and gas facilities, oil and gas leases, oil and gas drilling, petroleum refineries, industrial facilities that burn fossil fuels, and fossil fuel power plants. Pursuant to the MEPA Limitation, DEQ does not consider how a proposed project would contribute to climate change or adversely impact Montana's environment and natural resources. [AH 845:14-846:24; PE 949:7-15, 954:2-9; P138, P224, P232, P239, P240, P241, P242, P246, P249, P251,

P264, P276, P277, P278, P279, P280, P281, P282, P285-301; AH-58, AH-59, AH-60].

1. DNRC issues permits for fossil fuel projects, including coal mines and oil and gas extraction. DNRC does [\*101] not consider how GHG emissions from projects will contribute to climate change or adversely impact Montana's environment and natural resources or violate the Constitution, because of the MEPA Limitation. [P217-217; P233, P234, P235, P265-P275, P283, P284].

266. Montana's annual, historical, and cumulative GHG emissions are increased by Defendants' actions to permit and approve fossil fuel activities with no environmental review of their impact on GHG levels in the atmosphere and climate change. [PE 932:18-933:5].

267. Defendants' actions cause emissions of substantial levels of GHG pollution into the atmosphere within Montana and outside its borders, contributing to climate change. [SR 164:18-166:16; PE 932:18-933:5].

268. The State's actions exacerbate anthropogenic climate change and cause further harms to Montana's environment and its citizens, especially its youth. [AH 845:14-846:2; P150].

## **VIII. THE MEPA LIMITATION PREVENTS FULL REVIEW OF THE TECHNOLOGICALLY AND ECONOMICALLY AVAILABLE ALTERNATIVES TO FOSSIL FUEL ENERGY IN MONTANA.**

269. Dr. Mark Jacobson obtained a M.S. in Environmental Engineering, from Stanford University. Dr. Jacobson also obtained both a M.S. and later a Ph.D. in [\*102] Atmospheric Sciences from UCLA. In 1994, Dr. Jacobson became an Assistant Professor in the Department of Civil & Environmental Engineering at Stanford. Since 2007, he has been a full professor in that Department. Dr. Jacobson was a co-founder and is



Director of Stanford's Atmosphere/Energy Program, as well as a Senior Fellow at Stanford's Precourt Institute for Energy, and Stanford's Woods Institute for the Environment. Since 2008, Dr. Jacobson has been Director and Co-founder of The Solutions Project, an organization that utilizes the combined efforts of individuals in the fields of science, business, and culture to accelerate the transition to 100% renewable energy use in the United States. Starting in 1999, Dr. Jacobson began examining clean, renewable energy solutions. In 2015, this research culminated in the development of roadmaps to transition the all-sector energy infrastructures of each of the fifty United States to 100% clean, renewable energy by 2050, which Dr. Jacobson updated in 2022. Dr. Jacobson has published six textbooks of two editions each and over 175 peer-reviewed journal articles. Dr. Jacobson's career has focused on understanding air pollution and global warming [\*103] problems and developing large-scale clean, renewable energy solutions to those problems. In this case, Dr. Jacobson summarized his research related to Montana and the feasibility of transitioning Montana swiftly from fossil fuels to clean and renewable energy in all sectors by mid-century, where all energy sectors include electricity, transportation, heating/cooling, and industry. Dr. Jacobson is a well-qualified expert, and his testimony was informative and credible.

270. The MEPA Limitation causes the State to ignore renewable energy alternatives to fossil fuels. [MJ 1030:7-1032:24, 1035:9-23, 1069:18-1071:8, 1066:6-17, 1067:10-20; MJ-15, MJ-62, MJ-63; AH 823:15-825:3; P312].

271. Non-fossil fuel-based energy systems across all sectors, including electricity, transportation, heating/cooling, and industry, are currently economically feasible and technologically available to employ in Montana. Experts have already prepared a roadmap for the transition of Montana's all-purpose energy systems (for electricity, transportation, heating/cooling, and industry) to a 100% renewable portfolio by 2050, which, in

addition to direct climate benefits, will create jobs, reduce air pollution, and save [\*104] lives and costs associated with air pollution. [MJ 1030:7-1032:24, 1035:9-23, 1069:18-1071:8, 1066:6-17, 1067:10-20; P312; MJ-15, MJ-62, MJ-63].

272. It is technically and economically feasible for Montana to replace 80% of existing fossil fuel energy by 2030 and 100% by no later than 2050, but as early as 2035. [MJ 1072:4-23, 1100:9-1101:4; P312; MJ-62, MJ-63]. A number of countries around the world with populations far larger than Montana's relied on >95% wind, water, and sunlight (WWS) to power their electricity sectors in 2021. [MJ-44].

273. To replace fossil fuel energy, Montana would need to electrify all energy sectors with existing or near-existing appliances and machines, and then generate the electricity for all sectors with 100% WWS, namely onshore wind, utility-scale photovoltaics (PV), rooftop PV, geothermal power, and hydroelectric power. [MJ 1043:9-1045:8, 1045:15-1047:10; P312; MJ-12, MJ-15, MJ-18, MJ-19, MJ-20, MJ-29].

274. All-purpose Montana energy in 2050 can be met, for example, in one scenario, with 4.5 gigawatts (GW) of onshore wind, 3 GW of rooftop PV, 2.9 GW of utility-scale PV, 0.17 GW of geothermal electricity, and 2.7 GW of hydropower (which already exists). [\*105] [MJ 1057:2-1058:15; MJ-29].

275. Converting from fossil fuel energy to renewable energy would eliminate another \$21 billion in climate costs in 2050 to Montana and the world. Most noticeable to those in Montana, converting to wind, water, and solar energy would reduce annual total energy costs for Montanans from \$9.1 to \$2.8 billion per year, or by \$6.3 billion per year (69.6% savings). [MJ-39]. The total energy, health, plus climate cost savings, therefore, will be a combined \$29 billion per year (decreasing from \$32 to \$2.8 billion per year), or by 91%. [MJ 1061:20-1063:24; MJ-15, MJ-39, MJ-40, MJ-41, MJ-42].



276. Wind, water, and solar are the cheapest and most efficient form of energy. Cost per unit of energy in a 100% WWS system in Montana would be about 15% lower than a business-as-usual case by 2050, even when including increased costs for energy storage. New wind and solar are the lowest cost new forms of electric power in the United States, on the order of about half the cost of natural gas and even cheaper compared to coal. [MJ 1045:9-1047:10, 1062:8-1063:24; MJ-20].

277. According to a 2018 Montana DEQ report, *Understanding Energy in Montana*, Montana has significant solar energy [\*106] potential, comparable to many other U.S. cities. [MJ 1086:21-1087:4; P9; MJ-50].

278. The new footprint over land required to implement a 100% renewable energy system in Montana would be only about 0.06% of Montana's land. Utility scale solar would occupy 0.01% of Montana's land (fourteen square miles), while new wind turbines, including the land around those turbines, which could be used for agriculture, open space, or more solar panels, would occupy about 0.05% (seventy-one square miles) of Montana's land. In comparison, Montana's oil and gas wells and associated infrastructure already occupy about 304 square miles of land (0.21% of Montana land area). [MJ 1079:25-1082:3; MJ-46].

279. There is an abundant supply of renewable energy and four ways to store renewable energy: heat storage (in water), cold storage (as ice), electricity storage (pumped hydropower, batteries, hydrogen fuel cells), and hydrogen as a form of storage (for use in long distance transportation and steel production). [MJ 1057:2-15, 1058:5-15, 1072:24-1073:7, 1076:9-1077:22, 1079:22-1082:8; MJ-15, MJ-19, MJ-45, MJ-62].

280. Montana's energy needs in 2050 under a 100% WWS roadmap would decline significantly (over fifty [\*107] percent) as compared to a business-as-usual energy system due to a mix of gains in energy efficiency in vehicles and appliances, and through eliminating the significant amounts of energy

required to extract, transport, and refine fossil fuels. [MJ 1045:9-1047:10; MJ-15, MJ-19, MJ-20, MJ-21, MJ-22, MJ-23, MJ-24, MJ-25, MJ-26, MJ-27, MJ-28, MJ-55].

281. Transitioning to WWS will keep Montana's lights on while saving money, lives, and cleaning up the air and the environment, and ultimately using less of Montana's land resources. [MJ 1061:4-1062:12, 1066:6-17, 1066:18-1067:20, 1079:22-1082:8; MJ-15, MJ-20-MJ-30, MJ-39, MJ-41, MJ-42, MJ-46, MJ-56, MJ-57, MJ-58, MJ-62].

282. The current barriers to implementing renewable energy systems are not technical or economic, but social and political. Such barriers primarily result from government policies that slow down and inhibit the transition to renewables, and laws that allow utilization of fossil fuel development and preclude a faster transition to a clean, renewable energy system. [MJ 1042:15-1043:2, 1059:9-1061:3, 1100:9-1101:4, 1103:11-1104:24; MJ-15, MJ-19, MJ-20, MJ-33, MJ-35, MJ-36, MJ-38, MJ-62, MJ-63].

283. Montana has abundant renewable [\*108] energy resources that can provide enough energy to power Montana's energy needs for all purposes in 2050. [MJ 1058:2-15; MJ-15, MJ-19, MJ-29, MJ-30, MJ-46, MJ-47, MJ-48, MJ-50, MJ-61, MJ-62].

## IX. THE 1972 MONTANA CONSTITUTION.

284. Mae Nan Ellingson was a delegate to the 1972 Montana Constitutional Convention. Ms. Ellingson's testimony was informative and provided useful context, including on the compilation of the records of the Constitutional Convention proceedings on which Montana courts regularly rely. Ms. Ellingson was elected to the Constitutional Convention as a delegate from Missoula County.

285. The first "delegate proposal" advanced during the Constitutional Convention was for a constitutional provision on environmental quality.

286. Article IX, Section 1 of the Constitution states that "[t]he state and each person shall maintain and improve a clean and healthful environment in Montana for present and future generations." This provision came about after long debate to strengthen the environmental article recommended by the Natural Resources Committee by including the words "clean" and "healthful."

287. As reflected in the Constitutional Convention Transcripts (March 1, 1972, Vol. V 1230), Ms. Ellingson suggested the [\*109] "legislature shall provide adequate remedies to prevent" language of Article IX, Section 1 to assure greater protections of the current environment. She believed that if you are trying to protect the environment, you need the ability to sue or seek injunctive relief before the environmental damage is done--paying someone monetary damages after the harm is done does little good. This position was complemented by including the right to a clean and healthful environment in the Declaration of Rights in Article II, Sec. 3 of the Montana Constitution. The decision to include the right to a clean and healthful environment as one of the unalienable rights included in the Bill of Rights passed by a large majority.

288. During the Constitutional Convention, there were concerns among the delegates over the constitutional rights for people under the age of eighteen, and Article II, Section 15 in the Declaration of Rights was included to ensure that Montana's youth have the same fundamental rights as adults. This section was adopted with broad support.

289. Delegates to the 1972 Constitutional Convention intended to adopt the strongest preventative and anticipatory constitutional environmental provisions possible to protect Montana's air, water, and lands for present and future generations.

## CONCLUSIONS [\*110] OF LAW

1. To the extent that any of the foregoing Findings of Fact incorporate Conclusions of Law or the application of law to fact, they are incorporated herein as Conclusions of Law.

2. This Court has jurisdiction over the parties and subject matter in this case.

3. The Conclusions of Law are conformed to the evidence presented at trial by both parties. Mont. R. Civ. P. 15(b)(2). The Court will address the constitutionality of [Mont. Code Ann. § 75-1-201\(6\)\(a\)\(ii\)](#), which was enacted by SB 557 and addressed by both parties during trial and in trial briefing. *See, e.g.*, Docs. 390, 402.

## I. PLAINTIFFS HAVE PROVEN STANDING.

### A. Plaintiffs Have Proven Injury.

4. As described in the Findings of Fact, Youth Plaintiffs have experienced past and ongoing injuries resulting from the State's failure to consider GHGs and climate change, including injuries to their physical and mental health, homes and property, recreational, spiritual, and aesthetic interests, tribal and cultural traditions, economic security, and happiness.

5. Plaintiffs' mental health injuries directly resulting from State inaction or counterproductive action on climate change, on their own, do not establish a cognizable injury. [Steel Co. v. Citizens for a Better Env't., 523 U.S. 83, 107 \(1998\)](#). However, Plaintiffs' mental health injuries stemming from the effects [\*111] of climate change on Montana's environment, feelings like loss, despair, and anxiety, are cognizable injuries.

6. Every additional ton of GHG emissions exacerbates Plaintiffs' injuries and risks locking in irreversible climate injuries.

7. Plaintiffs' injuries will grow increasingly severe and irreversible without science-based actions to address climate change.

8. Plaintiffs have proven that as children and youth, they are disproportionately harmed by fossil fuel pollution and climate impacts.

9. Plaintiffs have proven that they have suffered injuries that are concrete, particularized, and distinguishable from the public generally.

10. Plaintiffs suffer and will continue to suffer injuries due to the State's statutorily mandated disregard of climate change and GHG emissions in the MEPA Limitation, and due to SB 557's removal of MEPA's preventative equitable remedies with [Mont. Code Ann. § 75-1-201\(6\)\(a\)\(ii\)](#).

### **B. Plaintiffs Have Proven Causation at Trial.**

11. The PSC is exempted from MEPA as a matter of law. [Mont. Code Ann. § 75-1-201\(3\)](#).<sup>2</sup>

12. There is a fairly traceable connection between the MEPA Limitation and the State's allowance of resulting fossil fuel GHG emissions, which contribute to and exacerbate Plaintiffs' injuries.

13. There is a fairly traceable [\*112] connection between the State's disregard of GHG emissions and climate change, pursuant to the MEPA Limitation, GHG emissions over which the State has control, climate change impacts, and Plaintiffs' proven injuries. Unlike in *Bitterrooters Inc.*, the causal relationship between the permitted activities and the resulting environmental harms is reasonably close. [Bitterrooters for Planning, Inc. v. Mont. Dep't of Env'tl. Quality, 2017 MT 222, ¶ 25, 401 P.3d 712](#). The State authorizes fossil fuel activities without analyzing GHGs or climate impacts, which result in GHG emissions in Montana and abroad that have caused and continue to exacerbate anthropogenic climate change.

14. The Defendants have the authority under the statutes by which they operate to protect Montana's

environment and natural resources, protect the health and safety of Montana's youth, and alleviate and avoid climate impacts by limiting fossil fuel activities that occur in Montana when the MEPA analysis shows that those activities are resulting in degradation or other harms which violate the Montana Constitution.

15. Montana's contributions to GHG emissions can be measured incrementally and cumulatively both in terms of immediate local effects and by mixing in the atmosphere and contributing to global climate change and [\*113] an already destabilized climate system.

16. Montana's GHG contributions are not *de minimis* but are nationally and globally significant. Montana's GHG emissions cause and contribute to climate change and Plaintiffs' injuries and reduce the opportunity to alleviate Plaintiffs' injuries.

### **C. Plaintiffs Have Proven Redressability at Trial.**

17. The psychological satisfaction of prevailing in this lawsuit does not establish redressability. [Steel Co. at 107](#).

18. Defendants can alleviate the harmful environmental effects of Montana's fossil fuel activities through the lawful exercise of their authority if they are allowed to consider GHG emissions and climate change during MEPA review, which would provide the clear information needed to conform their decision-making to the best science and their constitutional duties and constraints, and give them the necessary information to deny permits for fossil fuel activities when inconsistent with protecting Plaintiffs' constitutional rights.

19. Montana's land contains a significant quantity of fossil fuels yet to be extracted. The State and its agents could consider GHG emissions and climate impacts and reject projects that would lead to unreasonable degradation of Montana's [\*114]

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<sup>2</sup>Hereinafter, when the Court refers to Defendants or the State, the PSC is excluded.

environment.

20. A reduction in Montana's GHG emissions that results from a declaration that Montana's MEPA Limitation is unconstitutional would provide partial redress of Plaintiffs' injuries because the amount of additional GHG emissions emitted into the climate system today and in the coming decade will impact the long-term severity of the heating and the severity of Plaintiffs' injuries.

21. It is possible to affect future degradation to Montana's environment and natural resources and injuries to these Plaintiffs.

22. Permitting statutes give the State and its agents discretion to deny permits for fossil fuel activities. See, e.g., [Mont. Code Ann. §§ 75-2-203](#) and - 204 (discretion under Clean Air Act of Montana to prohibit facilities that cause air pollution); § 75-2-211(2)(a) (DEQ to provide rules governing suspension or revocation of air quality permits); § 75-2-218(2) (DEQ has discretion to deny air quality permits); § 75-2-217(1) (DEQ to provide rules governing suspension or revocation of operating permits); 75-20-301 (DEQ can only approve permits for Major Facility Siting Act facilities after considering numerous discretionary factors, including environmental impacts and public health, welfare, and safety); § 77-3-301 (state lands "may" be leased for coal if "in the best interests [\*115] of the state"); § 77-3-401 (state lands "may" be leased for oil and gas if consistent with the Constitution); § 82-4-102(3)(a) (stating purpose of surface and underground mining and reclamation laws to vest DEQ with rulemaking authority to "either approve or disapprove" new strip mines or new underground mines); § 82-4-227 (DEQ has wide discretion to refuse mining permits).

23. The State must either: 1) have discretion to deny permits for fossil fuel activities when the activities would result in GHG emissions that cause unconstitutional degradation and depletion of Montana's environment and natural resources, or infringement of the constitutional rights of Montana's children and youth; or 2) the permitting

statutes themselves must be unconstitutional.

24. "[C]ourts should avoid constitutional issues whenever possible." [Park Cnty. Env'tl Council v. Mont. Dep't of Env'tl. Quality, 2020 MT 303, ¶ 54, 477 P.3d 288](#) (citing [Sunburst Sch. Dist. No. 2 v. Texaco, Inc., 2007 MT 183, ¶ 62, 165 P.3d 1079](#)). Under the doctrine of constitutional avoidance, this Court clarifies that Defendants do have discretion to deny permits for fossil fuel activities that would result in unconstitutional levels of GHG emissions, unconstitutional degradation and depletion of Montana's environment and natural resources, or infringement of the constitutional rights of Montanans and Youth Plaintiffs.

**II. MONT. CODE ANN. § 75-1-201(6)(a)(ii) IS NOT A [\*116] BARRIER TO REDRESSABILITY BECAUSE IT IS FACIALLY UNCONSTITUTIONAL UNDER PARK COUNTY.**

25. [Mont. Code Ann. § 75-1-201 \(6\)\(a\)\(ii\)](#) eliminates the preventative remedies available to MEPA litigants: vacatur and injunction. The State raised [Mont. Code Ann. § 75-1-201 \(6\)\(a\)\(ii\)](#) during trial as a barrier to redressability in this case, bringing it before the Court and making the issue unavoidable.

26. The Legislature is obligated under Article IX, Sec. 1(3) to provide "adequate remedies for the protection of the environmental life support system from degradation" and "to prevent unreasonable depletion and degradation of natural resources." [Mont. Const. Art. IX, Sec. 1\(3\)](#).

27. "MEPA is an essential aspect of the State's efforts to meet its constitutional obligations, as are the equitable remedies without which MEPA is rendered meaningless." [Park Cnty.](#) ¶ 89.

28. In [Park Cnty.](#) a unanimous Court reasoned:

Montanans' right to a clean and healthful environment is complemented by an

affirmative duty upon their government to take active steps to realize this right. Article IX, § 1, Subsections 1 and 2 of the Montana Constitution command that the Legislature 'shall provide for the administration and enforcement' of measures to meet the State's obligation to 'maintain and improve' the environment. Critically, Subsection 3 explicitly directs the Legislature to 'provide adequate remedies to prevent unreasonable [\*117] depletion and degradation of natural resources

...

Without a mechanism to prevent a project from going forward until a MEPA violation has been addressed, MEPA's role in meeting the State's 'anticipatory and preventative' constitutional obligations is negated. Whatever interest might be served by a statute that instructs an agency to forecast and consider the environmental implications of a project that is already underway—perhaps analogous to a mandatory aircraft inspection after takeoff—the constitutional obligation to prevent certain environmental harms from arising is certainly not one of them.

*Id.* ¶¶ 63, 72.

29. Pursuant to the Court's decision in *Park Cnty.*, Mont. Code Ann. § 75-1-201 (6)(a)(ii) is facially unconstitutional because it eliminates MEPA litigants' remedies that prevent irreversible degradation of the environment, and it fails to further a compelling state interest. *Park Cnty.* ¶¶ 63, 69-72.

### III. ALL PLAINTIFFS' CONSTITUTIONAL CLAIMS ARE PREDICATED ON DEGRADATION OF MONTANA'S CLEAN AND HEALTHFUL ENVIRONMENT.

30. All of Plaintiffs' claims hinge on whether the MEPA Limitation and Mont. Code Ann. § 75-1-201 (6)(a)(ii) violate Mont Const. Art. II, Sec. 3 and Art. IX, Sec. 1.

a. The Public Trust Doctrine is already codified in the Montana Constitution in Art. IX, Sec. 3. *Gait v. State*, 225 Mont. 142, 144, 146, 731 P.2d 912, 913, 914 (1987) (citing *Mont Coal for Stream Access v. Curran*, 210 Mont 38, 682 P.2d 163 (1984) and *Mont Const. Art. IX, Sec. 3(3)*).

b. Except for Plaintiffs' mental health [\*118] injuries resulting from government inaction on climate change, the alleged equal protection, dignity, liberty, and health and safety violations all stem from harm to Montana's environment.

c. Plaintiffs' mental health injuries resulting from government inaction alone do not establish a cognizable, redressable injury.

d. It would be impossible for the Court to find that the MEPA Limitation and Mont Code Ann. § 75-1-201(6)(a)(ii) do not violate Art. II, Sec. 3 and Art. IX, Sec. 1, and then find that the statutes violate the Public Trust Doctrine or the rights to equal protection, dignity, liberty, or health and safety.

### IV. DETERMINING WHETHER THE CONSTITUTIONAL PROVISIONS AT ISSUE ARE SELF-EXECUTING IS UNNECESSARY TO RESOLVE THIS CONTROVERSY.

31. It is possible to resolve this case without determining whether Art. II, Sec. 3 and Art. IX, Sec. 1 are self-executing.

32. A determination that a right is non-self-executing "does not end the inquiry. As here, (1) once the Legislature has acted, or 'executed,' a provision (2) that implicates individual constitutional rights, courts can determine whether that enactment fulfills the Legislature's constitutional responsibility." *Columbia Falls Elem. Sch. Dist. No. 6 v. State*, 2005 MT 69, ¶ 17, 109 P.3d 257 (citing *City of Boerne v. Flores*, 521 U.S. 507 (1997)).

33.

"Provisions that directly implicate rights



guaranteed to individuals under our Constitution are in a [\*119] category of their own. That is, although the provision may be non-self-executing, thus requiring initial legislative action, the courts, as final interpreters of the Constitution, have the final obligation to guard, enforce, and protect every right granted or secured by the Constitution . . ."

*Brown v. Gianforte*, 2021 MT 149, ¶ 23, 488 P.3d 548 (citing *Columbia Falls Elem. Sch. Dist.*, ¶ 18 (quoting *Robb v. Connolly*, 111 U.S. 624, 637 (1884))).

34. Like in *Park Cnty.*, the question presented to the Court by this case "is straightforward: has the Legislature met its obligation to provide adequate remedies with which to prevent potential future environmental harms when it removes what appears to be the *only* available legal relief positioned to do so?" *Park Cnty.* ¶ 78. The MEPA Limitation, especially in conjunction with *Mont. Code Ann. § 75-1-201 (6)(a)(ii)*, removes the only preventative equitable relief available to the public and MEPA litigants concerned about GHGs and climate change, which are degrading Montana's environment

## V. THE MEPA LIMITATION IS SUBJECT TO STRICT SCRUTINY.

35. Any statute, policy, or rule which implicates a fundamental right must be strictly scrutinized and can only survive scrutiny if the State establishes a compelling state interest and that the action is narrowly tailored to effectuate that interest. *Park Cnty.* ¶ 84.

36. The MEPA Limitation is subject to [\*120] strict scrutiny because it implicates Plaintiffs' fundamental right to a clean and healthful environment.

## VI. THE MEPA LIMITATION VIOLATES

## THE MONTANA CONSTITUTION.

### A. MEPA Limitation violates Plaintiffs' Right to a Clean and Healthful Environment - *Mont. Const. Art. II, Sec. 3, 15; Art. IX, Sec. 1.*

37. Montana's Constitution provides: "All persons are born free and have certain inalienable rights. They include the right to a clean and healthful environment...." *Mont. Const. Art. II, Sec. 3.* Consistent with the provision of these rights and responsibilities, the Montana Constitution further provides: "The state and each person shall maintain and improve a clean and healthful environment in Montana for present and future generations." *Mont. Const. Art. IX, Sec. 1(1).*

38. Article II, Sec. 3 and Article IX, Sec. 1 are to be read together, along with the Preamble to Montana's Constitution. *MEIC I*, ¶¶ 65, 77. 39. The right to a clean and healthful environment is a fundamental right protected by *Mont. Const. Art. II, Sec. 3* and Art. IX, Sec. 1(1). *MEIC I*, ¶ 64.

40. Montana's children under age eighteen, have a fundamental right to a clean and healthful environment. *Mont. Const. Art. II, Sec. 15.* The right to a clean and healthful environment is intended to protect Montana's children and future generations.

41. During Montana's 1972 Constitutional Convention, delegates placed significant emphasis on protecting natural [\*121] resources and improving Montana's environment. The Montana Supreme Court has recognized that "it was agreed by both sides of the debate that it was the convention's intention to adopt whatever the convention could agree was the stronger language." *MEIC I*, ¶ 75 (citing Convention Transcripts, Vol. IV at 1209, Mar. 1, 1972). The Montana Supreme Court has repeatedly found that the Framers intended the state constitution contain "the strongest environmental protection provision found in any state constitution." *Park Cnty.*, ¶ 61.

42. The Constitutional Framers "did not intend to merely prohibit that degree of environmental degradation which can be conclusively linked to ill health or physical endangerment." *MEIC I*, ¶ 77. As Delegate Foster noted: "[I]f we put in the Constitution that the only line of defense is a healthful environment and that I have to show, in fact, that my health is being damaged in order to find some relief, then we've lost the battle." *MEIC I*, ¶ 14 (citing Convention Transcripts, Vol. V at 1243-44, Mar. 1, 1972).

43. The right to a clean and healthful environment language in Montana's Constitution is "forward-looking and preventative language" which "clearly indicates that Montanans have a right not only to reactive measures [\*122] after a constitutionally-proscribed environmental harm has occurred, but to be free of its occurrence in the first place." *Park Cnty.*, ¶ 62.

44. The right to a clean and healthful environment requires enhancement of Montana's environment. According to the Constitutional Delegates, "*our intention was to permit no degradation* from the present environment and affirmatively require enhancement of what we have now." *MEIC I*, ¶ 69 (quoting Convention Transcripts, Vol. IV at 1205, Mar. 1, 1972) (emphasis in original).

45. Montanans' right to a clean and healthful environment is complemented by an affirmative duty upon their government to take active steps to realize this right. Article IX, Sec. 1(1) and (2) of the Montana Constitution command that the Legislature "shall provide for the administration and enforcement" of measures to meet the State's obligation to "maintain and improve" the environment. Critically, Subsection 3 explicitly directs the Legislature to "provide adequate remedies to prevent unreasonable depletion and degradation of natural resources." *Mont. Const. Art. IX, Sec. 1(3); Park Cnty.*, ¶ 63.

46. The obligations of the Legislature found in Article IX, Sec. 1 include providing "adequate

remedies for the protection of the environmental life support system from degradation." *Mont. Const. Art. IX, Sec. 1(3)*.

47. According to Delegate McNeil, "the term [\*123] 'environmental life support system' is all-encompassing, including but not limited to air, water, and land; and whatever interpretation is afforded this phrase by the Legislature and courts, there is no question that it *cannot be degraded*." *MEIC I*, ¶ 67 (citing Convention Transcripts, Vol. IV at 1201, Mar. 1, 1972) (emphasis in original).

48. Montana's constitutional right to a clean and healthful environment prohibits environmental degradation that causes ill health or physical endangerment and unreasonable depletion or degradation of Montana's natural resources for this and future generations:

Our conclusions in *MEIC I* are consistent with the constitutional text's unambiguous reliance on preventative measures to ensure that Montanans' inalienable right to a 'clean and healthful environment' is as evident in the air, water, and soil of Montana as in its law books. Article IX, Section 1, of the Montana Constitution describes the environmental rights of 'future generations,' while requiring ; 'protection' of the environmental life support system 'from degradation' and 'prevent[ion of] unreasonable depletion and degradation' of the state's natural resources. This forward-looking and preventative language clearly indicates that Montanans have a right not only to reactive measures after a constitutionally-proscribed [\*124] I environmental harm has occurred, but to be free of its occurrence in the first place.

*Park Cnty.*, ¶ 62.

49. Based on the plain language of the implicated constitutional provisions, the intent of the Framers, and Montana Supreme Court precedent, climate is included in the "clean and healthful environment" and "environmental life support system." *Mont.*

[Const. Art. II, Sec. 3](#); Art. IX, Sec. 1.

50. Montana's climate, environment, and natural resources are unconstitutionally degraded and depleted due to the current atmospheric concentration of GHGs and climate change.

51. The right to a clean and healthful environment allows plaintiffs to obtain equitable relief before harm occurs. According to the Supreme Court:

When considering which remedies are 'adequate' in this context, we note that equitable relief, unlike monetary damages, can avert harms that would have otherwise arisen. It follows that equitable relief must play a role in the constitutional directive to ensure remedies that are adequate to prevent the potential degradation that could infringe upon the environmental rights of present and future generations. We are not alone in this conclusion. As Delegate Mae Nan Robinson pointed out during the 1972 Constitutional Convention: if you're really [\*125] trying to protect the environment, you'd better have something whereby you can sue or seek injunctive relief before the environmental damage has been done; it does very little good to pay someone monetary damages because the air has been polluted or because the stream has been polluted if you can't change the condition of the environment once it has been destroyed.

[Park Cnty.](#) ¶ 64 (citing [MEIC I](#) ¶ 71).

52. "The essential purpose of MEPA is to aid in the agency decision-making process otherwise provided by law by informing the agency and the interested public of environmental impacts that will likely result from agency actions or decisions." [Bitterrooters Inc.](#) ¶ 18.

53. "MEPA is an essential aspect of the State's efforts to meet its constitutional obligations." [Park Cnty.](#), ¶ 89; [§ 75-1-102, MCA](#).

54. The stated policy of MEPA makes clear that the

State should use "all practicable means" "so that the state may: (a) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (b) ensure for all Montanans safe, healthful, productive, and aesthetically and culturally pleasing surroundings; (c) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other [\*126] undesirable and unintended consequences ...." [§ 75-1-103, MCA](#).

55. By enacting and enforcing the MEPA Limitation, the State is failing to meet their affirmative duty to protect Plaintiffs' right to a clean and healthful environment, and to protect Montana's natural resources from unreasonable depletion.

56. The MEPA Limitation categorically limits what the agencies, officials, and agencies tasked with protecting Montana's clean and healthful environment can consider. The MEPA Limitation conflicts with the very purpose of MEPA, which is to aid the State in meeting its constitutional obligation to prevent degradation by "informing the agency and the interested public of environmental impacts that will likely result" from State actions. [Bitterrooters Inc.](#) ¶ 18; [§ 75-1-102\(1\), MCA](#) ("The legislature, mindful of its constitutional obligations under Article II, section 3, and Article IX of the Montana constitution, has enacted the Montana Environmental Policy Act . . . [to] provide for the adequate review of state actions in order to ensure that: (a) environmental attributes are fully considered . . .").

57. The plain language of the MEPA Limitation bars agencies from considering GHG emissions and climate impacts for any project or proposal, even to assess whether the project complies with the Montana Constitution. [\*127]

58. The MEPA Limitation is unconstitutionally contributing to the depletion and degradation of Montana's environment and natural resources and contributing to Plaintiffs' injuries. The MEPA Limitation deprives Plaintiffs of their



constitutionally guaranteed rights under [Mont. Const. Art. II, Sec. 3](#), and Art. IX, Sec. 1.

59. By prohibiting consideration of climate change, GHG emissions, and how additional GHG emissions will contribute to climate change or be consistent with the Montana Constitution, the MEPA Limitation violates Plaintiffs' right to a clean and healthful environment and is facially unconstitutional.

### **B. The MEPA Limitation Does Not Pass Strict Scrutiny.**

60. The MEPA Limitation infringes on fundamental rights and must pass strict scrutiny. [Mont. Cannabis Indus. Ass'n v. Montana, 2012 MT 201, ¶ 16, 366 Mont. 224, 286 P.3d 1161](#) ("*Mont. Cannabis Indus. Ass'n* (2012)"); see also [Kloss v. Edward D. Jones & Co., 2002 MT 129, ¶ 52, 310 Mont. 123, 54 P.3d 1](#).

61. Under strict scrutiny, "the government must show that the law is narrowly tailored to serve a compelling government interest." *Mont. Cannabis Indus. Ass'n* (2012), ¶ 16.

62. The State failed to show that the MEPA Limitation serves a compelling governmental interest.

63. The State did not put forward any evidence of a compelling governmental interest for the MEPA Limitation.

64. Undisputed testimony established that Defendants could [\*128] evaluate "greenhouse gas emissions and corresponding impacts to the climate in the state or beyond the state's borders" when evaluating fossil fuel activities. Indeed, Defendants have performed such evaluations in the past.

65. Undisputed testimony established that clean renewable energy is technically feasible and economically beneficial in Montana.

66. Even if the State had established a compelling

interest for the statute, the MEPA Limitation is not narrowly tailored to serve any interest.

67. The MEPA Limitation neither serves a compelling state interest nor is narrowly tailored and fails strict scrutiny.

### **ORDER**

1. Based upon the foregoing Findings of Fact and Conclusions of Law the Court determines and declares that:

2. The Youth Plaintiffs have standing to bring the claims addressed herein.

3. Montana's GHG emissions have been proven to be fairly traceable to the MEPA Limitation,

4. Montana's GHG emissions and climate change have been proven to be a substantial factor in causing climate impacts to Montana's environment and harm and injury to the Youth Plaintiffs.

5. This judgment will influence the State's conduct by invalidating statutes prohibiting analysis and remedies based on GHG [\*129] emissions and climate impacts, alleviating Youth Plaintiffs' injuries and preventing further injury.

6. By prohibiting analysis of GHG emissions and corresponding impacts to the climate, as well as how additional GHG emissions will contribute to climate change or be consistent with the Montana Constitution, the MEPA Limitation violates Youth Plaintiffs' right to a clean and healthful environment and is unconstitutional on its face.

7. Plaintiffs have a fundamental constitutional right to a clean and healthful environment, which includes climate as part of the environmental life-support system.

8. The 2023 version of the MEPA Limitation, Mont. Code Ann. § 75-1-201(2)(a), enacted into law by HB 971, is hereby declared unconstitutional and is permanently enjoined.

9. [Mont. Code Ann. § 75-1-201 \(6\)\(a\)\(ii\)](#), enacted into law by SB 557 from the 2023 legislative session, is hereby declared unconstitutional and is permanently enjoined because it removes the only preventative, equitable relief available to the public and MEPA litigants.

10. In addition to the findings, conclusions, and declarations set forth above, injunctive relief is appropriate, prohibiting Defendants from acting in accordance with the statutes declared unconstitutional.

11. Judgment is hereby found [\*130] in favor of the Plaintiffs as prevailing parties.

12. The Youth Plaintiffs requested an award of reasonable attorneys' fees and costs. (Doc. 1 at 104.). Pursuant to Rule 54 (d), Mont. R. Civ. P., Youth Plaintiffs shall submit their motion for fees and costs and documentation in support of their request for fees and costs, within fourteen days of the date of this Order. Defendants shall have fourteen days thereafter to respond, and shall have the opportunity to request a hearing pursuant to the provisions of Rule 43 (c), Mont. R. Civ. P. The Court reserves jurisdiction to issue its final judgment to include the issue of attorneys' fees and costs.

DATED this 14 day of August 2023.

/s/ Kathy Seeley

Kathy Seeley

District Court Judge

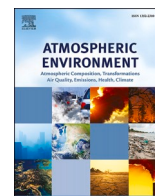
## **ATTACHMENT B**

LaCount, et al., "Reducing power sector emissions under the 1990 Clean Air Act Amendments: A retrospective on 30 years of program development," 245 Atmospheric Env't, Article 118012, p.2 (2021)



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## Reducing power sector emissions under the 1990 Clean Air Act Amendments: A retrospective on 30 years of program development and implementation

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### HIGHLIGHTS

- The 1990 Clean Air Act Amendments launched a new era in environmental protection.
- The Acid Rain Program's allowance trading program revolutionized air quality policy.
- This success spurred additional programs to address interstate transport of power plant emissions.
- Air pollution and environmental effects have decreased dramatically since 1990.
- Thirty years of implementation experience offers key environmental policy insights.

### ARTICLE INFO

#### Keywords:

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Air quality  
Allowance trading  
Ozone transport  
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### ABSTRACT

The 1990 Clean Air Act Amendments (CAAA) launched a new era in environmental protection. New provisions created the innovative Acid Rain Program to curtail acid-rain-causing emissions from the electric power sector through an allowance trading program. Success implementing this new type of program led to its expanded use to achieve additional power plant emission reductions in support of the CAAA "Good Neighbor" requirements. As a result, air pollution and its environmental effects have decreased dramatically in the last 30 years. Implementation of power plant regulations under the acid rain and Good Neighbor provisions of the CAAA provides insights into the efficacy of legislative versus regulatory policy and holds valuable lessons for future environmental policy.

### 1. Introduction

The 1990 Clean Air Act Amendments (CAAA) launched a new era in environmental protection. New provisions created the innovative Acid Rain Program to curtail acid-rain-causing emissions from the electric power sector through an allowance trading program. The U.S. Environmental Protection Agency's (EPA) success implementing this new type of program led to its expanded use to achieve additional reductions in support of the "Good Neighbor" requirements. A core element of the Good Neighbor provisions stipulate how the EPA and states must address interstate transport of air pollution that affects downwind states' ability to attain and maintain National Ambient Air Quality Standards (NAAQS), particularly ozone and fine particulate matter (PM<sub>2.5</sub>). Since the passage of the 1990 CAAA, the allowance trading

programs that have evolved to address interstate transport, coupled with the Acid Rain Program, have significantly affected air quality management, reduced power sector emissions, and improved human health and the environment in the United States.

In the 30 years since passage of the CAAA, air pollution has decreased dramatically. Annual sulfur dioxide (SO<sub>2</sub>) emissions from power plants decreased by 94 percent from 1990 to 2019 and annual emissions of nitrogen oxides (NO<sub>x</sub>) from power plants fell 86 percent (US EPA, 2020a). In 2019, reported annual SO<sub>2</sub> and NO<sub>x</sub> emissions from power plants were below 1 million tons for the first time in modern history (US EPA 2020a; US EPA, 1994). National average SO<sub>2</sub> annual mean ambient concentrations declined 91 percent between 1990 and 2018, and regional ambient particulate sulfate concentrations decreased 47 to 81 percent from the 1989–1991 period to the 2016–2018 period

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(US EPA, 2019). All areas of the eastern U.S. have shown significant improvement in wet sulfur deposition with an overall 66 percent reduction from 2000 to 2002 to 2016–2018. Additionally, between these same time intervals, there was an overall regional reduction of 19 percent in the highest (99th percentile) ozone concentrations levels in the eastern U.S. (US EPA, 2018).

Implementation of power plant regulations under the acid rain and interstate transport provisions of the CAAA provides insights into the efficacy of legislative versus regulatory policy and holds valuable lessons for future policy endeavors of either variety. Here we examine two of the major air quality problems the CAAA were meant to tackle – acid rain and interstate transport of air pollution affecting the ability of states to attain and maintain the NAAQS. We then examine the implementation of two separate provisions included in the CAAA to address these problems, Title IV and relevant provisions in Section 110 of Title I, and the way in which their intertwined implementation led to the evolution of air quality policy and contributed to significant changes in the power sector. Finally, we turn to results of the power sector control programs developed under these provisions and lessons learned for the future.

## 2. History

### 2.1. Large-scale regional pollution problems

#### 2.1.1. Acid rain

Acid deposition or “acid rain” occurs when emissions of SO<sub>2</sub> and NO<sub>x</sub> in the atmosphere react with water, oxygen, and oxidants to form mild solutions of sulfuric acid or nitric acid. These compounds fall to the Earth in either wet form (e.g., rain, snow, fog) or dry form (e.g., particles, gases). In the U.S., the issue of acidic deposition emerged in the early 1970s (Likens et al., 1972). While scientific knowledge of ecosystem acidification dates to the mid-18th century, and significant research had been undertaken in the first half of the 20th century (Gorham, 1998), relatively little was known about the magnitude and distribution of acidic deposition, nor about its effects on terrestrial and aquatic ecosystems. However, many researchers believed that acidic deposition and its air pollutant precursors posed a potential threat to forests, aquatic organisms, crops, structures and cultural artifacts, and even human health.

Following a decade of ground-breaking research, funded at \$570 million, the National Acid Precipitation Assessment Program (NAPAP) documented a causal link between emissions of SO<sub>2</sub> and NO<sub>x</sub>, increases in the atmospheric concentration of these pollutants, and “acid rain” (NAPAP, 1991). In the years since the 1991 NAPAP report, a growing body of literature has gone on to link wet and dry acidic deposition, and the emissions that produce them, to surface water acidification, declining aquatic ecosystem health, depletion of forest soil nutrients and the declining health of some tree species, damage to architectural structures and cultural resources, adverse effects on human health, and increased regional haze and reduced visibility (Driscoll et al., 2001; NAPAP, 2011).

The CAAA Title IV authorized creation of the Acid Deposition Control Program, commonly known as the Acid Rain Program (ARP), to reduce the adverse effects of acidic deposition through phased reductions of annual emissions of its precursors, SO<sub>2</sub> and NO<sub>x</sub>. In a novel development, Title IV specifically focused on ecosystem protection as opposed to effects on human health. At the time, there was no accepted protocol for valuing ecosystem improvements. As a result, EPA’s Regulatory Impact Analysis (RIA) for the Final Acid Rain Implementation Regulations notably found no quantifiable benefits of implementing the ARP, stating instead that the “regulations examined in the RIA are not expected to provide environmental benefits” (ICF Resources Incorporated, 1992). In practice, the results turned out quite differently and emission reductions to protect ecosystems yielded large human health co-benefits. Studies have shown the human health and environmental benefits of lower SO<sub>2</sub> and NO<sub>x</sub> emissions has far outweighed both the

substantial acid rain reduction and the overall relatively low cost to achieve the reductions. (Chestnut and Mills, 2005; NAPAP, 2011; Schmalensee and Stavins, 2017).

#### 2.1.2. Interstate transport of air pollution

Interstate air pollution transport refers to pollution from upwind emission sources in one state affecting the air quality in a downwind state. Emissions of SO<sub>2</sub> and NO<sub>x</sub> from upwind sources can undergo chemical reactions in the atmosphere to form PM<sub>2.5</sub> pollution. Similarly, NO<sub>x</sub> emissions can react in the atmosphere to create ground-level ozone pollution. These pollutants can travel great distances (i.e., hundreds of miles), affecting air quality and public health regionally.

The transport of these pollutants across state borders can make it difficult for NAAQS nonattainment areas in downwind states to meet health-based air quality standards for PM<sub>2.5</sub> and ozone. Congress recognized the regional nature of pollution and included several different provisions in the CAA and the 1990 Amendments, including creation of the Ozone Transport Commission (OTC) to facilitate regional coordination across 12 Northeast states and the District of Columbia, the ability for downwind states to petition EPA to control upwind emissions, and requirements that every state evaluate whether its emissions affect another state each time EPA updates a NAAQS.

The CAAA’s Title I Section 110(a) (2) (D) (i) (I) “Good Neighbor” provision requires states to prohibit emissions that contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to any NAAQS. However, the provision does not define what it means to “contribute significantly”, so EPA and states have had to provide that meaning. For every revision of the ozone NAAQS, regulatory authorities (states or EPA) must identify areas that are expected to have ongoing nonattainment. Next, authorities conduct air quality analyses to determine whether other states are contributing to ongoing nonattainment. If other states are part of the problem, the next step is to perform an evaluation weighing potential emission reductions, associated costs, air quality benefits, and other relevant factors to determine if additional emission reductions from contributing areas should be required. Contingent upon the outcome of this analysis, rules are crafted to require additional reductions. The mechanism of choice to achieve these reductions has been an allowance trading program under a constrained emissions budget. Both the EPA and states have implemented such programs under the Good Neighbor provision to regulate power plant emissions of SO<sub>2</sub>, NO<sub>x</sub>, and the resulting PM<sub>2.5</sub> and ozone, that contribute significantly to nonattainment and interfere with maintenance of the PM<sub>2.5</sub> and ozone NAAQS. The success of the Acid Rain Program in achieving large reductions at relatively low costs had an important influence on the initial application of allowance trading to achieve reductions under the Good Neighbor provision.

### 2.2. Large-scale regional policy solution

In passing the CAAA, Congress chose to use a novel environmental management approach known as cap-and-trade, or “allowance trading” to address the acid rain problem. Through subsequent regulations, EPA expanded the use of this tool to address the persistent problem of interstate transport of air pollution affecting states’ ability to attain and maintain the PM<sub>2.5</sub> and ozone NAAQS. Allowance trading is a departure from more traditional “command-and-control” regulatory approaches in which the government requires individual plants to install specific control technologies to reduce pollution, regardless of varying costs of controls among the plants. Because allowance trading sets an overall emission limit across a group of plants, but provides firms with the flexibility to determine how and where to reduce pollution, emissions can be reduced more cost effectively and with less administrative burden than through a more traditional regulatory regime. This approach enables regulations to set more ambitious emission reduction goals than would otherwise be possible with command-and-control regulations, while imposing the same or lower costs to society. The goal of these

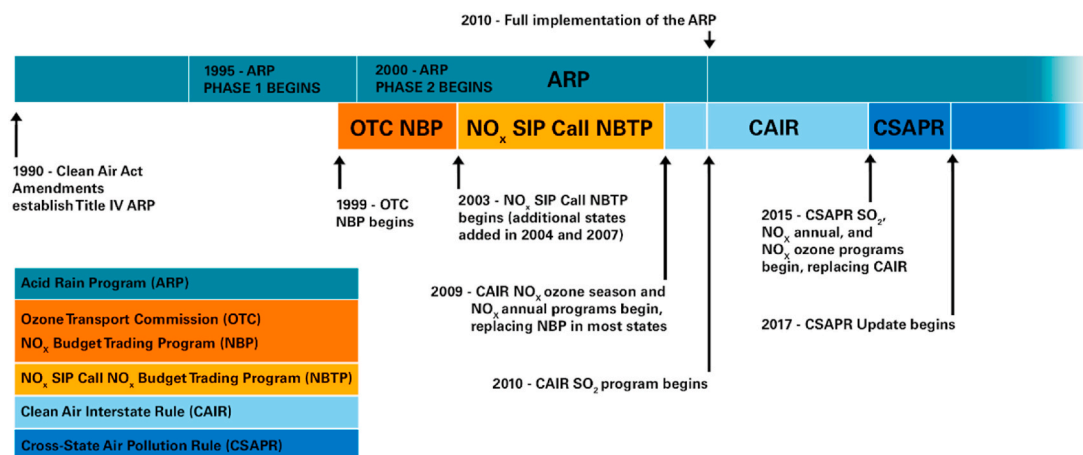


Fig. 1. A timeline of relevant allowance trading programs covered in this paper.

programs is to achieve broad regional reductions, complementing state and local efforts to address local air quality concerns. A timeline of allowance trading programs can be seen in Fig. 1.

Allowance trading programs have two key components: a limit (or cap) on total pollution from a group of sources, and tradable allowances equal to the cap, authorizing allowance holders to emit a specific quantity (e.g., one ton) of a pollutant. The limit ensures that the environmental goal is met and sustained, regardless of growth in the number of pollution sources or increases in power generation. The limit applies across all sources collectively, and no source has a limit on its individual emissions. Tradable allowances, with the ability to bank unused allowances for compliance in a future year, provide flexibility for individual sources to determine their own compliance path. Because allowances can be bought and sold in an allowance market, these programs are often referred to as “market-based.” Sources must completely and accurately measure and report all emissions and then hold sufficient allowances to cover emissions at the end of the compliance period. These allowances are then removed from the market and are not available for use by other sources in that period or future periods. Should a source fail to hold sufficient allowances, automatic monetary and possible allowance penalties apply. This provides a strong and direct incentive favoring compliance and ensures that any excess emissions are automatically offset by future reductions.

### 2.3. Evolution of power sector emission reduction programs

#### 2.3.1. Acid Rain Program

Title IV of the CAAA, which marked the culmination of years of research and policy negotiations, very clearly laid out the framework for the SO<sub>2</sub> allowance trading program, down to the criteria for allowance allocation and penalties for noncompliance. NO<sub>x</sub> reductions under the ARP were based on a more traditional rate-based regulatory requirement. The ARP was implemented in two phases: Phase I began in 1995 (1996 for NO<sub>x</sub>) and Phase II began in 2000. The first phase included the largest, highest emitting coal-fired units, primarily in the Eastern U.S., while the second phase expanded coverage to smaller coal-fired units, as well as oil and gas units in the 48 contiguous states.

Under the ARP, in accordance with the statute, EPA interacted with sources directly. This marked a significant departure from the traditional cooperative federalism approach where state agencies typically interact with emitting facilities more often than EPA does. Affected sources reported directly to EPA, and compliance determination involved a simple comparison of emissions with allowance holdings, also tracked by EPA. This relatively novel direct interaction between EPA and regulated sources significantly contributed to the program's success, in part due to the relationships forged between stakeholder and

regulator through extended engagement during the creation of implementing regulations for the ARP. EPA also relied heavily on the Acid Rain Advisory Committee (ARAC), created under the Federal Advisory Committee Act (FACA) and consisting of a large and diverse group of affected stakeholders including large and small power generators, state environmental agencies and utility commissions, environmental groups, coal and gas interests, and academia. ARAC began meeting soon after the legislation was enacted and worked collaboratively to help interpret the provisions in the Act and draft the implementing regulations. This committee was instrumental in EPA's implementation efforts, informing regulations with their unique insights and expertise through active development and consideration of regulatory options and identification of potential problems. ARAC also helped familiarize other stakeholders to this novel approach to regulation and advocated for its success (Claussen, 2001; McLean, 1997; US EPA, 1992).

Because the ultimate goal of the ARP was ecosystem protection, the primary focus of the program was to reduce deposition of sulfur and nitrogen species, rather than to reduce atmospheric concentrations of pollutants. While the protection of public health is the main driver of most CAAA provisions, it ultimately became an unanticipated co-benefit of the ARP. The broad regional reductions pursued – and achieved – under Title IV dramatically lowered atmospheric concentrations of pollutants.

#### 2.3.2. OTC NO<sub>x</sub> Budget Program

The early success of the ARP prompted widespread interest in allowance trading approaches. By the early 1990s, the latest science indicated that addressing persistent high ambient ozone levels might require NO<sub>x</sub> emission reductions (National Research Council, 1991), and allowance trading emerged as a promising mechanism to address this air quality problem. Northeastern states, as part of the CAAA-established Ozone Transport Commission, worked with EPA to develop and implement a multi-state allowance trading program to reduce regional transport of ozone season NO<sub>x</sub> emissions that contribute to ozone nonattainment in other states. The OTC NO<sub>x</sub> Budget Program began in 1999. By 2002, in conjunction with previous requirements, the program reduced ozone season emissions approximately 60 percent below 1990 baseline levels, well under target levels. Deep reductions occurred in all states across the region and daily peak emissions declined (US EPA, 2003). This promising application of allowance trading to a new environmental challenge further heightened interest in this relatively new policy tool and stimulated international interest in the approach and how it might apply to air quality and climate change challenges abroad.



### 2.3.3. SIP call NOX Budget Trading Program

Also during this time, EPA established the Ozone Transport Assessment Group (OTAG), a coalition of 37 states, industry, and environmental groups, to assess and recommend strategies to reduce the transport of ozone in the Northeast. The “NOX SIP Call” incorporated OTAG recommendations, including the use of allowance trading to achieve regional NOX emission reductions from power plants ([Availability of Documents for the Rulemaking for Certain States in the Ozone Transport Assessment Group Region, 1998](#)). The NOX SIP Call required states in the eastern U.S. to submit state implementation plans (SIPs) detailing how they would curtail emissions that were impeding the ability of other states in the region to attain, or maintain attainment with, the ozone NAAQS. The NOX SIP Call affected 21 jurisdictions (20 states plus the District of Columbia), and set state-level ozone-season (May 1 – September 30) NOX emission budgets to achieve the needed reductions. EPA created a model regional allowance trading program that states could choose to adopt to meet the emissions targets and that EPA would administer. All affected states chose to adopt the model allowance trading rule and participate in the NOX Budget Trading Program (NBTP), which operated during the 2003–2008 ozone seasons.

The NBTP differed from the ARP in multiple ways, including the narrowed regional focus and expanded applicability beyond the electric power sector to certain large industrial boilers and combustion turbines. Air quality improvements were the main goal, while ecosystem benefits were secondary. The role of states and EPA regional offices (as distinct from EPA headquarters) increased due to the focus on NAAQS attainment and implementing CAAA Title I provisions, which designate states as the primary actors. States had a prominent role in program creation and implementation, including discretion over how allowances were distributed among sources. Finally, the NBTP was created via regulation, based on EPA’s interpretation of language found in CAAA Title I provisions. This absence of an extensive statutory basis for the NBTP led to litigation over EPA’s interpretation of the CAAA, resulting in program revisions that included delayed implementation and modified geography, but also supported EPA’s consideration of cost when determining needed reductions, which set an important precedent for future regulatory action.

### 2.3.4. Clean Air Interstate Rule

The administration of George W. Bush sought to address continued difficulties with ozone and PM<sub>2.5</sub> NAAQS attainment through multi-pollutant legislation. The Bush administration’s proposed Clear Skies Act would have created allowance trading programs for NO<sub>x</sub>, SO<sub>2</sub>, and mercury. Other legislative proposals under consideration at the time also would have included a CO<sub>2</sub> trading program ([Parker and Blodgett, 2006](#)). As a backstop for the Clear Skies legislative effort, which ultimately failed to win passage, the administration opted for a regulatory approach through the Clean Air Interstate Rule (CAIR), designed to be implemented through three separate allowance trading programs. The rule focused on reducing pollution that contributed to the formation of fine particulate matter year-round, and ozone in the summer months, to help states achieve the 1997 ozone and PM<sub>2.5</sub> NAAQS. State emission budgets, derived from an overarching regional emission reduction goal, were required under three separate programs: an ozone-season NO<sub>x</sub> program to address ozone, and annual NO<sub>x</sub> and annual SO<sub>2</sub> programs for fine particulate matter.

To simplify implementation and compliance, EPA integrated programs by requiring that existing ARP SO<sub>2</sub> allowances be used for compliance with the CAIR SO<sub>2</sub> requirement. To achieve the new, tighter emission caps, CAIR required the use of two ARP allowances for each ton of SO<sub>2</sub> emitted under the CAIR SO<sub>2</sub> program, effectively nesting a more stringent SO<sub>2</sub> requirement inside the existing ARP requirement. The rule was issued in 2005 and the CAIR NO<sub>x</sub> ozone season and NO<sub>x</sub> annual programs began in 2009, replacing the NBTP, while the CAIR SO<sub>2</sub> program began in 2010. As with the NBTP, litigation ensued and CAIR was remanded to EPA in 2008 with directions to replace it as rapidly as

possible. Among other findings, the court reasoned that EPA could not require allowances created under Title IV to be used for compliance in a program under Title I ([North Carolina v. EPA, 2008](#)).

### 2.3.5. Cross-State Air Pollution Rule

In 2011, EPA replaced CAIR with the Cross-State Air Pollution Rule (CSAPR), continuing to rely on allowance trading programs to address the interstate transport of emissions from power plants while addressing the concerns in the CAIR court decision. After several years of litigation, CSAPR was implemented in two phases, with Phase I beginning in 2015 and Phase II in 2017. In CSAPR, EPA made a concerted effort to methodically and systematically outline a framework for determining emission reduction obligations under the Good Neighbor provision based on the approach used for both the NBTP and CAIR.

CSAPR’s trading programs include design features that responded to the Court’s ruling on CAIR, reflecting new constraints on EPA’s interpretation of the Good Neighbor provision. For example, state emission budgets under CSAPR were designed to reflect emission reductions linked to specific downwind receptors for which an upwind state significantly contributed to nonattainment and interference with maintenance of the NAAQS. As with CAIR, CSAPR included multiple allowance trading programs to address both seasonal ozone and annual PM<sub>2.5</sub> concerns. In contrast to CAIR, however, CSAPR included additional sub-regional trading “groups” for the SO<sub>2</sub> trading program. The trading groups reflect the differing stringency of SO<sub>2</sub> reductions required to address significant contribution of pollution and the challenge of complying with the NAAQS for each state, and were included to ensure that state-level emission budgets were directly tied to downwind non-attainment receptors. In CSAPR Phase II, Group 1 states were required to make further reductions because there were continuing downwind air quality concerns, while CSAPR Group 2 SO<sub>2</sub> state budgets remained at the same level.

Another new design feature – an explicit response to the *North Carolina* decision noted above – was the assurance provisions, developed to help ensure the emission reductions required to eliminate significant contribution would occur within each state. The assurance provisions include a “variability limit” meant to account for the inherent variability in power sector operations and consequent variability in annual emissions, while still ensuring adequate reductions. If a state’s emissions exceed the state budget plus variability limits, EPA determines responsible sources and requires them to surrender additional allowances. These features added significant implementation complexity, but also demonstrated the flexibility inherent in allowance trading to adapt to meet changing needs.

### 2.3.6. Cross-State Air Pollution Rule update

In 2016, EPA updated the CSAPR ozone season trading program by creating a new NO<sub>x</sub> ozone season trading group to help states attain the more stringent ozone NAAQS promulgated in 2008. One important feature of the CSAPR Update was to limit the use of the large bank of unused CSAPR ozone season program allowances that had accrued from reductions beyond levels required by the program. As total emissions fall below the program cap, a high volume of unused allowances can accrue, affecting the ability of a future program to achieve further emission reductions if the allowances retain their full value for compliance with the new program. The CSAPR Update included a one-time conversion ratio, whereby sources were issued one CSAPR Update allowance for every 3.278 banked CSAPR ozone season allowances. These new design elements further illustrate adaptability of allowance trading as an environmental policy mechanism evolving over time.

In the CSAPR Update rule, EPA reasoned that the required reductions were not necessarily all that would be needed to fully address the Good Neighbor obligations for the 2008 ozone NAAQS. In December 2018, EPA issued the CSAPR Close-Out rule, wherein additional analysis concluded that no further reductions were needed and that compliance with the CSAPR Update satisfied the Good Neighbor obligations. Both

rules were challenged in court and decisions issued in 2019 took issue with EPA’s explanation of how attainment deadlines and evaluation of required reductions were considered in the two actions. The first decision (*Wisconsin v. EPA*, 2019) remanded the CSAPR Update to EPA for revision, and the second decision (*New York v. EPA*, 2019) vacated the CSAPR Close-Out rule. How EPA addresses the latest court rulings will likely open a new chapter in the evolution of regulatory programs to address power sector emissions.

### 3. Results of EPA’s power sector emission reduction programs

#### 3.1. Emission reductions

Over the last twenty-five years, significant emission reductions have been achieved through allowance trading programs. In 1990, when the CAAA was signed, annual power sector emissions were 15.73 million tons of SO<sub>2</sub> and 6.42 million tons of NO<sub>x</sub>. In the initial year of ARP in 1995, as a result of early compliance, emissions were 11.83 million tons of SO<sub>2</sub> and 5.84 million tons of NO<sub>x</sub>. By 2005, before the implementation of CAIR, power sector emissions were down to 10.22 million tons of SO<sub>2</sub>, 3.63 million tons of annual NO<sub>x</sub> and 1.27 million tons of ozone season NO<sub>x</sub>. In 2019, after implementation of CAIR and CSAPR requirements, power sector emissions decreased to 969 thousand tons of SO<sub>2</sub> (14.8 million tons and 94 percent below 1990 levels), annual NO<sub>x</sub> emissions were 877 thousand tons (down 5.5 million tons, or 86 percent, from 1990 levels), and ozone season NO<sub>x</sub> emissions were 390 thousand tons (2.3 million tons, or 85 percent, lower than 1990 levels). Emission trends are shown in Figs. 2–4 (US EPA, 2020a).

#### 3.2. Control technology

The ARP and subsequent programs contributed to development of effective pollution controls, providing covered sources with a variety of control options to reduce SO<sub>2</sub> and NO<sub>x</sub> emissions by creating competition among different technologies, leading to improvements and innovations in those technologies and, as a result, lower costs (Taylor, 2012; Ellerman, 2000). For control of SO<sub>2</sub> emissions, sources could switch to lower sulfur coal or natural gas, apply flue gas desulfurization (FGD) technology, or shift generation from higher emitting units to lower emitting units at a plant or across their fleet. To reduce NO<sub>x</sub> emissions, sources could install advanced post-combustion controls that included selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) technologies, or combustion controls such as low NO<sub>x</sub> burners and overfired air.

Controls on coal-fired power plants increased greatly from 2000 to 2019, as seen in Figs. 5 and 6. FGDs, or advanced SO<sub>2</sub> controls, were installed on 24% of operating coal capacity in 2000 and 82% in 2019. It is important to note that, starting in 2015, the Mercury and Air Toxics Standards (MATS), a regulatory program that did not involve allowance

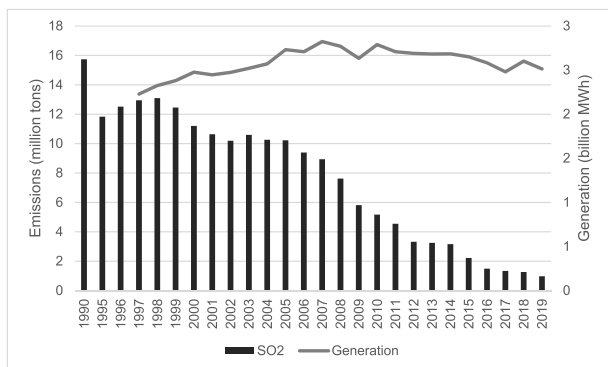


Fig. 2. Electricity generation and sulfur dioxide (SO<sub>2</sub>) emissions by covered sources from 1990 to 2019.

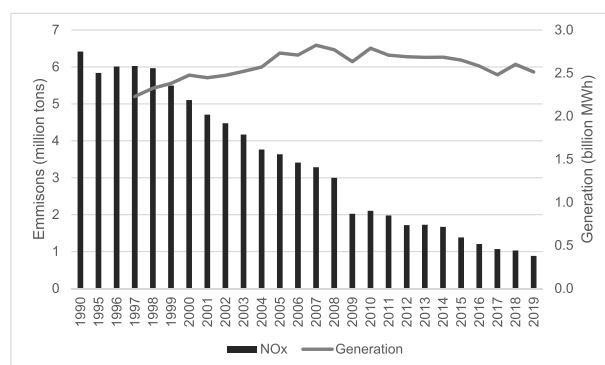


Fig. 3. Electricity generation and annual nitrogen oxide (NO<sub>x</sub>) emissions by covered sources from 1990 to 2019.

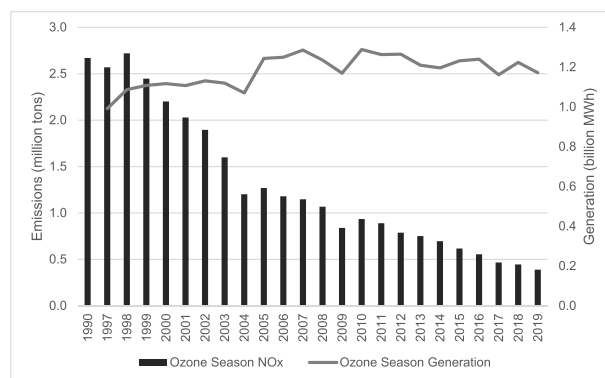


Fig. 4. Electricity generation and ozone season nitrogen oxides (NO<sub>x</sub>) emissions by covered sources from 1997 to 2019. 1990 emission levels are estimated as five twelfths of 1990 annual NO<sub>x</sub> emissions, as temporal distribution is not available.

trading, also contributed to the installation of advanced SO<sub>2</sub> controls. SCRs and SNCRs, advanced NO<sub>x</sub> controls, were installed on 4% of operating coal capacity in 2000 and 68% in 2019. Increases in installation of control technologies are evident across the nation in these two maps based on EPA data (US EPA, 2020a; US EPA, 2020b).

#### 3.3. Emission monitoring

Market-based programs require accurate and comprehensive emission monitoring. For these programs, almost 4000 fossil fuel-fired affected sources at power plants monitor, quality assure, and report SO<sub>2</sub>, NO<sub>x</sub>, and CO<sub>2</sub> to EPA under 40 CFR Part 75. The largest emitters are required by regulation to have continuous stack emission monitors that are calibrated daily with NIST-traceable gases, and quality assured quarterly across the range of measurements. Once or twice a year, the frequency is determined by the results of the test, each monitor must be compared to a stack test using an EPA reference method.

At the end of each calendar quarter, each source must report detailed hourly emission and operations data. The reports must be complete and account for every hour of operation. The reporting regulation includes procedures for substituting data when monitors fail quality assurance tests or are unavailable. The monitoring regulations include certain flexibilities, such as less-costly measurement approaches for low emitters, built-in incentives for greater accuracy and completeness, and a petition process to accommodate unexpected situations. Each quarter, EPA performs extensive checks on the submitted data and periodically conducts on-site facility audits of the monitoring systems (Schakenbacht et al., 2006).

The SO<sub>2</sub> and NO<sub>x</sub> monitoring data are used for compliance. While



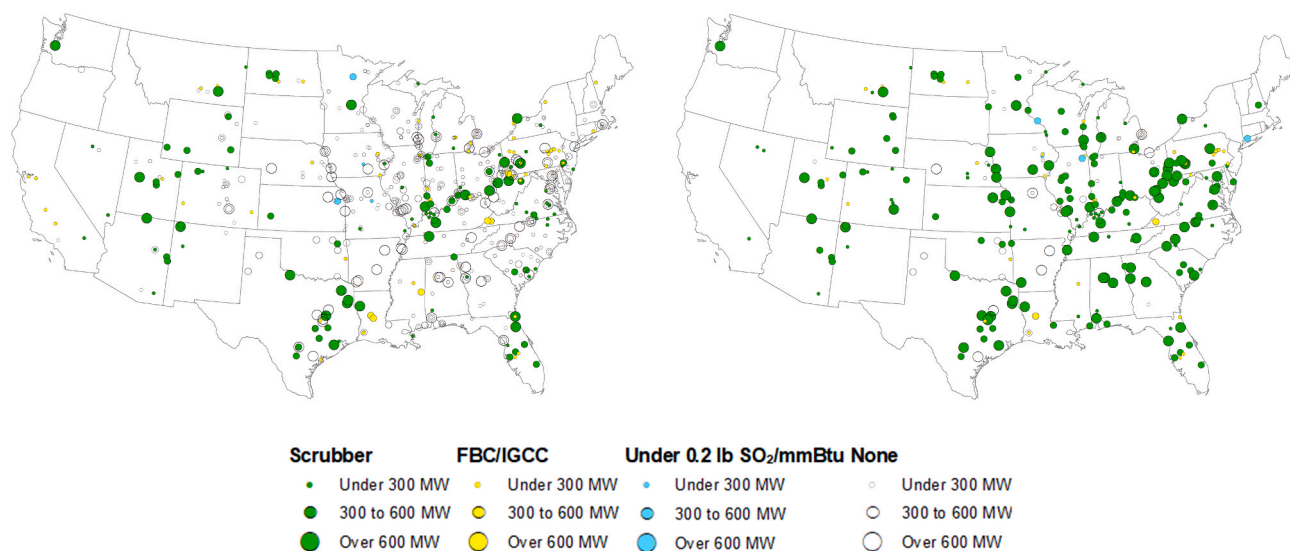


Fig. 5. Map showing power plants using SO<sub>2</sub> controls in 2000 (left) versus 2019 (right). Types of controls include flue-gas desulfurization or scrubbers, fluidized bed combustion (FBC), integrated gasification combined cycle (IGCC).

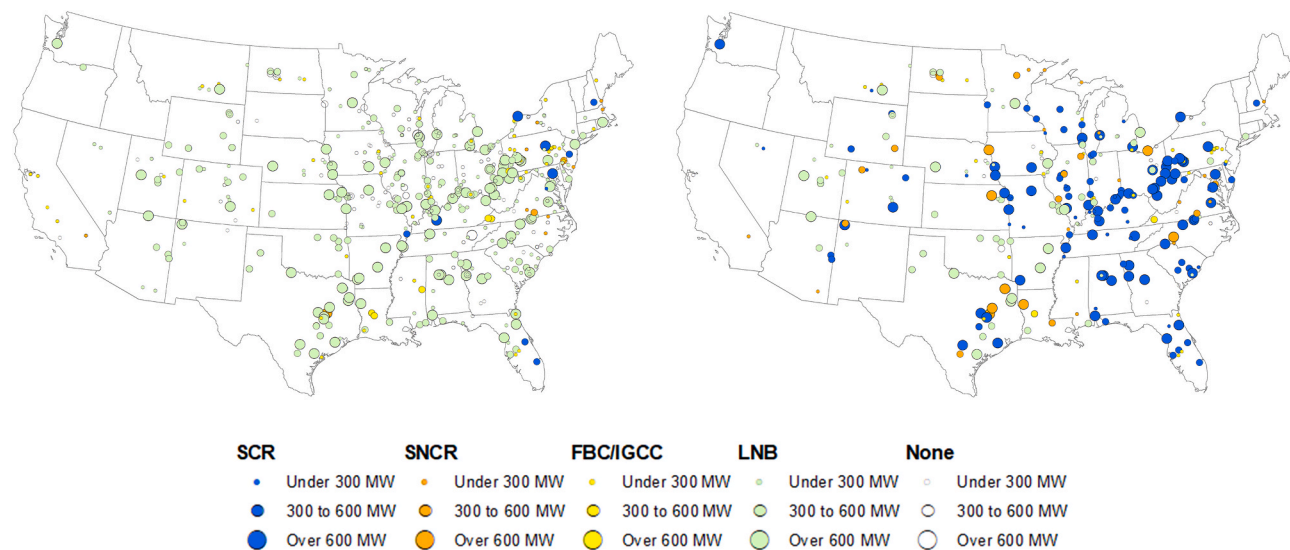


Fig. 6. Map showing power plants using NO<sub>x</sub> controls in 2000 (left) versus 2019 (right). Types of controls include selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), fluidized bed combustion (FBC), integrated gasification combined cycle (IGCC), and low-NO<sub>x</sub> burners (LNB).

CO<sub>2</sub> data are not used for compliance with these allowance trading programs, the CAAA authorizes collection of CO<sub>2</sub> emission data and they are also used in determining heat input and NO<sub>x</sub> emission rates. Collecting this comprehensive data set has been an invaluable feature of allowance trading programs. Most emissions are measured by

continuous emission monitoring systems (CEMS). All data are posted and publicly available at the Air Markets Program Data (AMPD) website (US EPA, 2020a). In 2019, 99 percent of SO<sub>2</sub> emissions, 98 percent of annual NO<sub>x</sub> emissions, and 97 percent of ozone season NO<sub>x</sub> emissions were monitored using CEMS technology, shown in Table 1.

Table 1

Types of units monitoring with and without continuous emission monitoring systems (CEMS), by tons of pollutants emitted.

Monitoring Methodology	SO <sub>2</sub> Emissions (tons)	NO <sub>x</sub> Mass (tons)	Ozone Season NO <sub>x</sub> Emissions (tons)
Coal with CEMS	582,173	425,271	187,876
Gas with CEMS	229	47,727	62,597
Gas without CEMS	2714	7378	6213
Oil with CEMS	465	1046	708
Oil without CEMS	401	998	349
Other with CEMS	20,901	4993	1787
Other without CEMS	43	0	0

### 3.4. Environmental effects

Accompanying papers in this special issue provide detailed analysis of environmental change over time in response to implementation of the ARP and subsequent allowance trading programs to address interstate transport of emissions. As such, we will note only high-level results. Three-year average concentrations for nitrate, sulfate, and ozone reflect rural air monitoring efforts. Rural is defined as 20 km from major point sources, 50 km from cities with a population greater than 50,000, and 2 km from major highways. The aim of three-year averaging is to reduce effects of variability that occur between monitoring years.

Three-year average concentrations of ambient particulate sulfate in

the eastern U.S. (east of 100° west longitude) have decreased 47 to 81 percent in observed regions from the 1989–1991 period to the 2016–2018 period. Three-year average concentrations of ambient annual total nitrate in the eastern U.S. declined an average of 56 percent. Ambient SO<sub>2</sub> concentrations measured at rural and urban sites across the contiguous U.S. decreased 93 percent between 1980 and 2018. From 2000 to 2002 and 2016–2018, three-year average concentrations for ozone declined 27 percent in states covered by CSAPR. Similar trends have been observed for total deposition of sulfur and nitrogen. Total sulfur deposition in the eastern U.S. decreased an average of 76 percent from the 2000–2002 period to the 2016–2018 period. Total nitrogen deposition has decreased an average of 29 percent for the same region and time period. Trends in surface water metrics, including sulfate anions, acid neutralizing capacity, and sum of base cations, show improvements in aquatic ecosystem health in most monitored lakes and streams in New England, the Adirondacks, and the Catskills mountains (USEPA, 2019).

#### 4. Discussion

The power sector emission reduction programs described here arose under very different circumstances: the ARP was mandated under a precisely written statute to address a pressing ecological problem; on the other hand, the succession of NBTP/CAIR/CSAPR programs, which extended the allowance trading model to address pressing human health problems, were mandated by regulations stemming from a single broadly written requirement of the statute, and therefore subject to delays and changes resulting from legal challenges to EPA's interpretation of the statute. The different circumstances governing this evolution have nonetheless produced programs that are similar in core design features, using allowance trading programs to require power sector emission reductions in a transparent, cost-effective manner. As such, together they provide useful lessons learned to inform the development of future air quality policy and emission reduction programs.

##### 4.1. Legislation is more certain than regulation

One of the most important lessons from implementation of allowance trading programs under both Title IV and Title I is the value of a specific legislative mandate. Because the ARP SO<sub>2</sub> control program had an explicit mandate in Title IV, and the legislative language is precise and comprehensive, implementation has been virtually free from litigation, with the notable exception of relatively minor challenges to certain implementing regulations. Additionally, the Title IV provisions created an added incentive for facilities not to litigate: should the program be delayed, they would risk being subject to source-by-source emissions limits generally similar to their allowance allocations, and lose the flexibility to comply using allowances purchased from other sources. This was significant because the flexibility inherent in an allowance trading program under a budget allowed Congress to pursue more significant reductions than otherwise thought feasible under a more traditional approach. In contrast to Title IV, as described earlier, each succeeding regulatory effort to design a regional allowance trading program grounded in the Good Neighbor provisions of CAAA Title I has been beset by litigation challenging administrative interpretation of statutory language. In each case, this litigation has led to significant delay, uncertainty for the affected sources, changes to the regulation and implementation, and constraints on subsequent programs. Of course, establishing a legislative mandate is not an easy task, as evident through the series of thwarted efforts to legislate federal allowance trading programs for power plant emission reductions in the late 1990s and early 2000s.

##### 4.2. Stakeholders belong at the table

From the beginning of the ARP, EPA relied heavily on input from

stakeholders – in the form of the ARAC – and this helped set the tone for the compliance partnerships that have continued over the last 25 years. This input extends beyond notice and comment rulemaking requirements, which provide an inherent and formal consideration of multiple perspectives, and has evolved over time as programs have grown and changed. Initial stakeholder interactions were focused on policy and regulatory development, but over time they have moved into compliance- and data analysis-oriented partnerships.

Following the early years of the ARP, the policy partnership approach continued in EPA's collaboration with OTC state model rule development, followed by a robust stakeholder process from proposal through implementation for the NO<sub>x</sub> SIP Call's NBTP that included multiple in-person meetings to discuss details of the program design to inform EPA's proposal. Subsequently, EPA was able to build on input gathered in the public meetings on the Clear Skies and other multi-pollutant legislative proposals to develop CAIR.

When it came to the design of CSAPR programs, which were strongly influenced by court decisions, legal deadlines, and the formal regulatory notice and comment process, the stakeholder input that had so effectively informed early programs was more limited. However, stakeholders influenced – and continue to influence – design and implementation of these programs. EPA now focuses on helping to ensure that the emission reductions are achieved by making sure the regulated community has the resources it needs to successfully comply.

Outside of new program development, EPA interacts daily with many stakeholders through different actions—technical experts assist affected sources with questions about requirements; compliance reporting tools provide automatic quality assurance checks; and extensive web-based resources help sources understand and comply with requirements. Additionally, EPA partners with states in developing SIPs to meet their air quality goals and obligations. The daily interactions on the implementation side of the programs have helped shape programs over time (McAllister, 2007; Napolitano, 2007).

Despite these implementation partnership successes, interactions on the policy side have grown more difficult as control options become more expensive and the nature of emission sources and air quality effects have evolved over time. In a time of court orders with tight deadlines for the formal rule development process, EPA has faced increasing difficulty finding policy solutions that receive the widespread stakeholder support and consensus that early programs enjoyed, making broad stakeholder input all the more important.

##### 4.3. Allowance trading programs provide accountability and results

The allowance trading framework has proven flexible and resilient, despite the many external challenges from evolving circumstances and protracted litigation. Power plants have achieved dramatic cuts in the emissions that cause acid rain and harm public health with no evidence that hotspots, or areas of increased emissions, materialized, as some early observers feared (Swift, 2004; Ringquist, 2011). Most coal-fired electricity generation now comes from facilities with state-of-the-art emission controls. There is significant evidence that implementation of allowance trading programs prompted greater innovation and deployment of clean technologies that reduce emissions and control costs (Schmalensee and Stavins, 2017; Popp 2003; Bellas and Lange 2011; Swift, 2001).

The design of the programs lays the groundwork for success: comprehensive emission monitoring and timely reporting provides accountability and transparency; compliance determination is simple and directly ties to program goals; and penalties for non-compliance are automatic and non-negotiable. Observers have noted that the critical features of an allowance trading program are accurate and comprehensive measurement of emissions, and certain consequences for noncompliance (Swift, 2004; Siikamäki et al., 2012). Automatic penalties include financial penalties for ARP and, for subsequent programs, additional allowance surrender requirements that were intended to

restore environmental gains and penalize non-compliance. As a result, each of the programs described in this paper has consistently seen near-complete compliance with very little need for enforcement actions. This is a noteworthy feat in the world of environmental regulations, and earned the Acid Rain Program distinction as “one of the most effective and efficient pollution reduction programs in EPA’s history” (Giles, 2020).

The reported data are posted on EPA’s website at the end of each calendar quarter reporting period, leading to program integrity and confidence (See <https://ampd.epa.gov/ampd/>). EPA has developed tools to allow data users to more easily access and understand the data (See <https://www.epa.gov/airmarkets/data-resources>). With continued progress in data analytic tools, EPA has evolved into an important resource for detailed data on the operations and associated emissions of the power sector.

Allowance trading is an effective tool for broad reductions and works in tandem with other CAAA requirements. For example, existing allowance trading programs have continued to deliver emissions reductions as additional programs undertaken under other CAAA provisions, such as MATS, delivered co-benefits by working to control toxic air pollutants. Recent research has found that potential regulatory efforts to control emissions, such as CO<sub>2</sub>, from the same power sector sources would deliver additional co-benefits in terms of criteria air pollution reductions when implemented alongside existing programs (Driscoll et al., 2015). In the case of the ARP and programs implemented under the Good Neighbor provision, regulatory efforts were intended to achieve broad regional emission reductions, but with somewhat different goals. As discussed, the ARP had the goal of reducing emissions to decrease the harmful ecological effects of atmospheric deposition. Good Neighbor programs were created to support attainment and maintenance of NAAQS by reducing regional emissions that significantly contribute to downwind air quality problems across state lines, rather than to achieve full attainment of the NAAQS outright. The allowance trading programs have effectively reduced regional emissions in ways states would have found difficult, if not impossible, to implement, and the resulting widespread improvement in overall air quality is evident across the region. Then, if needed, state and local governments, and EPA, can impose additional requirements to address remaining local air quality concerns.

#### 4.4. Assessment and communication are foundational

Routine collection, tracking and communication of program data and environmental results are essential to program implementation and instilling public confidence. Under the right conditions, such data can inform future program development and lead to important changes. For example, the bank adjustment in the CSAPR Update was a direct result of tracking allowance activity and the size of the allowance bank and assessing the potential impact on program implementation and environmental results. The response was to build in a regulatory provision to reduce the bank to ensure achievement of the environmental goal.

In the case of the ARP, Congress built in an assessment mechanism by requiring NAPAP reports every four years – and the last report to Congress concluded that further reductions were necessary to achieve the Title IV ecosystem protection goals (NAPAP, 2011). However, Congress did not include the means to act on the assessment results. Because the emission goals were set by statute, assessment of air quality, atmospheric deposition, and ecological response could not yield further emission reduction requirements without Congressional action, and further mandated reductions failed to materialize in the face of the many obstacles inherent in amending a major statute. Ultimately, as this history of power sector programs shows, further emission reductions were achieved, but in response to public health drivers – the NAAQS – instead of assessments finding the Title IV cap levels were insufficient to meet the ecosystem protection goal of the ARP. As such, the ARP experience argues for including a means for implementing a dynamically adjusting

cap in response to periodic assessments that have been used in other allowance trading programs like Regional Greenhouse Gas Initiative (RGGI), European Union Emissions Trading System (EU ETS), and California’s AB32 program (Narassimhan, 2018). While EPA has not employed dynamic caps to date, they could be considered for future programs.

#### 4.5. Adaptability is critical

Emission reduction programs should be designed to remain effective even under evolving circumstances. Experience with existing programs demonstrates two important realities: on the one hand, allowance trading programs have demonstrated sufficient flexibility to evolve in the face of new constraints and changing circumstances; on the other hand, in some cases, programs cannot adapt quickly enough to remain driving forces for emission reductions.

As evident in the progression from the ARP through CSAPR Update, allowance trading as an environmental policy mechanism has evolved over time. NO<sub>x</sub> emissions are now a primary focus as ambient ozone concentrations and attainment with the ozone NAAQS pose a persistent air quality concern. As allowance trading programs focused on NAAQS attainment under Title I have come to the forefront, the review and approval of SIPs has become a critical element of implementation. As such, the number of stakeholders has increased, along with the complexity of program design and implementation. With each new program and the seemingly inevitable litigation that follows, the elegant simplicity of the ARP recedes further into the past. For example, the court decision that remanded CAIR (*North Carolina v. EPA, 2008*) upended an approach in which a program could establish overall regional emission limits, instead requiring that each state emission budget must address specifically the downwind air quality effects to which an upwind state is linked. As a result, the CSAPR program included assurance provisions to help ensure that appropriate amounts of emission reductions occurred in each upwind state.

Subsequent allowance trading programs have also been designed with cognizance of the changing nature of the power sector. For example, one of the design features contributing to the environmental success of allowance trading programs was the possibility of banking allowances for future compliance. Consequently, emission reductions and environmental progress occurred earlier than otherwise would have been the case as firms prepared for future compliance requirements. Current economics favor natural gas and renewable energy over coal, resulting in much lower emissions. These unanticipated significant additional reductions created increasingly large allowance banks and led directly to the bank conversion in the CSAPR Update to ensure a surplus of allowances would not undermine program goals. And, while litigation on the CSAPR Update ensued, the subsequent decision remanding the CSAPR Update (*Wisconsin v. EPA, 2019*) did not find fault with that provision.

## 5. Conclusion

From ARP to CSAPR, allowance trading programs have evolved over time to address changing industry and environmental challenges. The core principles of accountability, transparency, and results have characterized each program iteration. These programs have been successful because of their results-oriented, adaptable nature and their collaborative implementation style, where EPA, states, and stakeholders are allies in achieving program goals. Setting the environmental and human health mandates and allowing industry to decide how to achieve the emission reductions has proven effective. Among the features contributing to success are the transparency afforded by continuous emissions monitoring and publicly accessible data; compliance directly correlated to emissions reduction requirements; and automatic penalties for failing to meet emissions obligations. The result has been near-complete compliance, with the additional benefit of emission and operation



data at an unprecedented level of accuracy, detail and public access.

The proven long-term success of allowance trading as a flexible, effective tool for achieving substantial emission reductions over large geographic areas during the last 30 years has played a significant role in across-the-board improvements in air quality across the country. However, despite the resilience of power sector programs over time, this review of thirty years of emission reduction programs illustrates some important challenges. For example, to the extent possible within the constraints of CAAA statutory language, future programs could include features such as an auto-correct dynamic budget adjustment or formal periodic review as an added feature to ensure continued program efficacy. Other programs include such features and periodically revisit program parameters.

Moreover, the future of allowance trading remains to be seen in an era where air quality continues to improve, areas with persistent air quality problems shrink, and the power sector moves in an ever-cleaner direction. Scientists and policy makers continue working to understand the role of emission sources both large and small close to ozone non-attainment areas, and addressing the contribution of cars and trucks and other non-road mobile sources may prove important to future air quality challenges. In addition, recent research on the intersection of air quality and a changing climate posits a “climate penalty,” meaning that greater emissions reductions could be required to achieve ozone NAAQS attainment due to variations in factors such as temperature, precipitation, and biogenic emissions resulting from a changing climate (Peel et al., 2013; Shen et al., 2019). Such changes could pose future air quality management challenges.

Still, the compliance results and regulatory flexibility that the allowance trading approach has provided in its first 30 years bode well for its future relevance. Though policymakers cannot always pursue the optimal path, they should endeavor to keep rules and obligations as simple as possible to promote compliance and keep costs low. Markets tend to function better when the rules are simple and easily understood by all participants. Under programs like the Regional Greenhouse Gas Initiative and California’s AB32 program, states continue to rely on adaptation of the original ARP allowance trading model to reduce CO<sub>2</sub> emissions. It is likely that the environmental results ensured through clear objectives, strong monitoring, and predictable penalties delivered by allowance trading programs will be part of the solution to remaining and future challenges.

## Disclaimer

The views expressed in this article are those of the authors and do not necessarily represent the views or policies of the U.S. Environmental Protection Agency.

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**Melanie D. LaCount:** Conceptualization, Writing - original draft, Writing - review & editing. **Richard A. Haeuber:** Conceptualization, Supervision, Writing - original draft, Writing - review & editing. **Taylor R. Macy:** Data curation, Visualization, Writing - original draft. **Beth A. Murray:** Conceptualization, Writing - original draft, Writing - review & editing.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## CERTIFICATE OF COMPLIANCE – WORD COUNT

I certify that this brief complies with the word-count limits of Pa.R.A.P. 531(b)(1)(i), as it contains fewer than 7,000 words, not including excluded materials under Pa.R.A.P. 2135(b). This brief contains 6,693 words.

Date: July 22, 2024

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**CERTIFICATE OF COMPLIANCE UNDER Pa.R.A.P. 127**

I certify that this filing complies with the provisions of the *Public Access Policy of the Unified Judicial System of Pennsylvania: Case Records of the Appellate and Trial Courts* that requires filing confidential information and documents differently than non-confidential information and documents.

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## CERTIFICATE OF SERVICE

I hereby certify that I have, on this date, served a true and correct copy of the foregoing document in 111 MAP 2023 upon the following and in the manner indicated below:

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