FILED
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Bowen Greenwood
CLERK OF THE SUPREME COURT
STATE OF MONTANA

IN THE SUPREME COURT OF THE STATE OF MONTANA
No. DA 23-0225

MONTANA ENVIRONMENTAL INFORMATION CENTER and SIERRA CLUB,

Plaintiffs/Appellees/Cross-Appellants,

v.

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY and NORTHWESTERN CORP.,

Defendants/Appellants/Cross-Appellees

STATE OF MONTANA, BY AND THROUGH THE OFFICE OF THE ATTORNEY GENERAL,

Intervenor Defendant-Appellant.

SUPPLEMENTAL APPENDIX OF APPELLEES/CROSS-APPELLANTS

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AR Begin	AR End	Description	MEIC Bates Begin	MEIC Bates End
		Email RE: MEIC/Sierra Club v. DEQ, No. 21-1307 (August 29, 2023)	MEIC-0001	MEIC-0002
		Cause No. CDV-2020-307 Findings of Fact, Conclusions of Law, and Order (August 14, 2023)	MEIC-0003	MEIC-0105
DEQ001117	DEQ001155	DEQ Montana Air Quality Permit Decision for NorthWestern Energy-Laurel Generating Station (excerpts)	MEIC-0106	MEIC-0144
DEQ001279		Letter from DEQ deeming Montana Air Quality Permit #5261-00 final.	MEIC-0145	
DEQ001993	DEQ001197	Email from W. Thompson (NWE) to C. Jones (DEQ) (Aug. 13, 2021)	MEIC-0146	MEIC-0150
DEQ002136		Air Quality Permit Application # 5261	MEIC-0151	
DEQ002185		NorthWestern's Montana 2023 Request for Proposals, Air Emissions Modeling Information, App.	MEIC-0152	

		C. Emissions Inventory, Potential to Emit Analysis (PTE) (Sep. 1, 2020)		
DEQ002188		NorthWestern's Montana 2023 Request for Proposals, Air Emissions Modeling Information, App. C. Emissions Inventory, Annual Emissions chart (Sep. 1, 2020)	MEIC-0153	
DEQ002886		Kathleen Gilluly, "*Groups challenge state's approval of NorthWestern's Laurel Gas Plant*," Laurel Outlook (Oct. 28, 2021)	MEIC-0154	

From: Langston, Jeremiah
To: Jenny Harbine
Cc: Amanda Galvan
Subject: RE: MEIC/Sierra Club v. DEQ, No. 21-1307
Date: Tuesday, August 29, 2023 5:00:32 PM

External Sender

Jenny and Amanda,

With the appeal and stay in place, DEQ does not intend to move forward with the remand analysis at this time, but we may revisit that as we monitor the circumstances around the case.

-Jeremiah

From: Jenny Harbine <jharbine@earthjustice.org>
Sent: Monday, August 28, 2023 4:43 PM
To: Langston, Jeremiah <Jeremiah.Langston2@mt.gov>
Cc: Amanda Galvan <agalvan@earthjustice.org>
Subject: [EXTERNAL] RE: MEIC/Sierra Club v. DEQ, No. 21-1307

Thank you.

From: Langston, Jeremiah <Jeremiah.Langston2@mt.gov>
Sent: Monday, August 28, 2023 4:01 PM
To: Jenny Harbine <jharbine@earthjustice.org>
Cc: Amanda Galvan <agalvan@earthjustice.org>
Subject: RE: MEIC/Sierra Club v. DEQ, No. 21-1307

External Sender

Jenny,

I need to confer with the higher ups at the agency, but I will get back to you when I have an answer (hopefully by tomorrow).

-Jeremiah

From: Jenny Harbine <jharbine@earthjustice.org>
Sent: Monday, August 28, 2023 11:10 AM

To: Langston, Jeremiah <Jeremiah.Langston2@mt.gov>
Cc: Amanda Galvan <agalvan@earthjustice.org>
Subject: [EXTERNAL] MEIC/Sierra Club v. DEQ, No. 21-1307

Good morning, Jeremiah. When we spoke just over a week ago, you mentioned that DEQ did not have plans for finalizing its remand analysis for the Laurel gas plant in response to Judge Moses' order or the district court injunction in Held v. Montana against implementing HB 971. Can you provide us with an update of whether DEQ intends to complete that remand analysis and when?

Thanks,
Jenny

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FILED

AUG 14 2023

ANGIE SPARKS, Clerk of District Court
By H Coleman Deputy Clerk

MONTANA FIRST JUDICIAL DISTRICT COURT
LEWIS AND CLARK COUNTY

RIKKI HELD, et al., Plaintiff, v. STATE OF MONTANA, et al., Defendant.	Cause No. CDV-2020-307 **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 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 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 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. (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.

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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 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 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.

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On April 14, 2023, Plaintiffs filed a Response Brief in Opposition to Defendants' Motion to Partially 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 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).

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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' 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

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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, 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[1]

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

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.

[1] 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.

2. Plaintiffs are Rikki Held, Lander Busse, Sariel Sandoval, Kian Tanner, Georgianna Fischer, Kathryn Grace Gibson-Snyder, Olivia Vesovich, Claire Vlases, Taleah Hernández, 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 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 when this case was filed, and is currently twenty years old.

11. Taleah Hernández is from Polson, 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 and Conservation, Montana Department of Transportation, and Montana Public Service Commission.

20. The State of Montana is a governmental entity.

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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 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; Def. 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 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 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].

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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 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].

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54. Montana's State Energy Policy was codified at Mont. Code Ann. § 90-4-1001. [Def. Answer, Doc. 11 ¶ 112].

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.

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. 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 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_2 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

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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 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_2) 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_2 emitted by human activities persists in the atmosphere for as long as hundreds of years or millennia. As a result, CO_2 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 of CO_2 to the point that 42% of the total accumulation of CO_2 emissions has happened in the last thirty years. [SR 141:16-142:2; SR-42].

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73. It has long been understood that certain GHGs, including CO_2 and methane (CH_4), 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_2 could one day warm the planet. [SR 108:1-8]. Arrhenius, and other early climate scientists, understood that the more CO_2 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_2 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_2 at Mauna Loa, Hawaii, a remote location not near any local CO_2 sources. [SR 111:12-21]. Keeling's data, now replicated at dozens of stations worldwide, proved that CO_2 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_2 concentrations has become known as the "Keeling Curve." [SR 110:22-111:11, 113:20].

76. Between 1960 and 2000, CO_2 levels rose at about 2 ppm per year, but since approximately 2000, CO_2 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].

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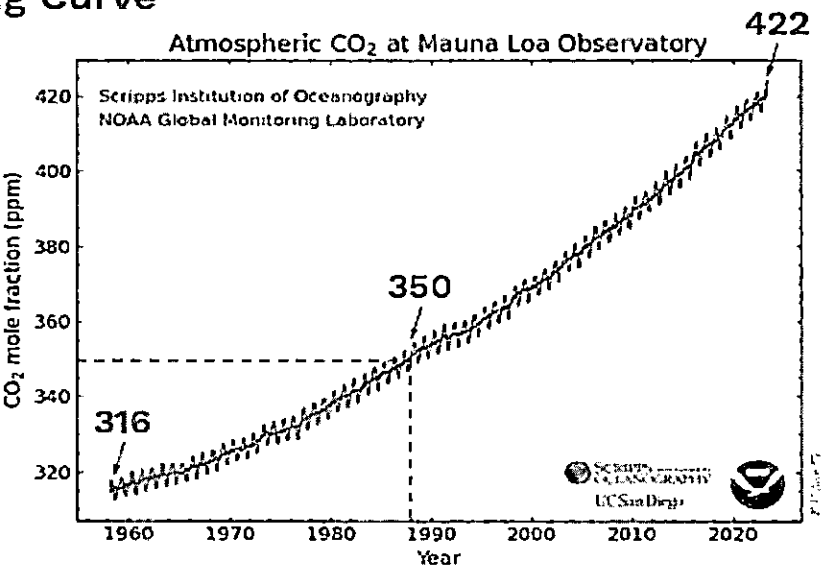
Keeling Curve



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77. CO_2 levels have fluctuated throughout history, but the rate of increase in atmospheric CO_2 is 100 times faster than in natural CO_2 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_2 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 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].

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81. The Earth has warmed by 1.3 to 2.2°F in only the last thirty-five years, as atmospheric CO_2 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 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^{-2}. 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^{-2}. [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 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_2 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_2 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_2 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_2 emissions, or 35 gigatons of CO_2, is attributable to burning fossil fuels. [SR 115:9-17; SR-20]. Approximately 11% of annual anthropogenic CO_2 is from land use change, which includes wildfires, agricultural burning, and deforestation.

[SR 115:18-22, 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_2 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; 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].

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94. Projections indicate atmospheric CO_2 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, 275:21-276:7; 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. 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].

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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. 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

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Health in Montana: A Special Report of the Montana Climate Assessment," as well as other climate and health publications.

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 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 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 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 testified to specific personal consequences. For example:

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

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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 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].

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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].

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].

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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 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].

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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 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, 1213:7-23, 1215:13-24].

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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 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 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_2. [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].

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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 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 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 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

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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_2 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 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 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 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 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].

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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 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].

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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 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,

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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, 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 drought 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 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 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

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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; 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].

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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, 169:19-21; CW 318:2-5, 316:17-317-14; DF 428:6-12; JS 712:8-12].

V. 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 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.

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j. With less water and grasses, cattle 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.

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

a. Lander and Badge enjoy hunting and fishing.

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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 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.

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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 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.

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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 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 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.

l. 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.

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-county 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 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.

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h. Kian's fears about impacts to the climate take an emotional toll on him and he feels a heavy burden to carry the mantel 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. Goergi'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 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 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.

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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 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 cause her eyes to swell shut and can 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 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.

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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, 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 Hernández 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 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 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 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 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.

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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, 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.

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

c. Abnormal and extreme weather 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 meals eaten at Crow Fair involved

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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 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. 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 categories, Mr. Erickson quantified the amount of coal, oil, and gas and translated that in units of carbon dioxide (CO_2) 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 to 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 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_2 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_2 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 that in 2019, total annual fossil fuels consumed in Montana led to about 32 million tons of CO_2 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_2 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_2 emissions due to Montana's fossil fuel-based economy is about 166 million tons CO_2. [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_2 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 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_2 emissions from all fossil fuels extracted in Montana since 1960 is 3.7 billion metric tons of CO_2. [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 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, 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_2 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 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

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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 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).

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242. Other components of SB 557 limit who can challenge an agency's final decision, the scope of the challenge, 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 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, 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].

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 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 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].

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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 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 MEPA 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].

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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 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, P255; AH-56].

g. DEQ authorized the operation of Colstrip Steam Electric Station—which produced 13.2 million metric tons of carbon dioxide equivalent (CO_2e), 38,015 metric tons methane, and 65,919 metric tons nitrous oxide in 2018. CO_2e 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 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].

l. DNRC issues permits for fossil fuel projects, including coal mines and oil and gas extraction. DNRC does 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].

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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 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 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 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). [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].

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277. According to a 2018 Montana DEQ report, Understanding Energy in Montana, Montana has significant solar energy 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 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 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.

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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 "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 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 Envt.*, 523 U.S. 83,

107 (1998). However, Plaintiffs' mental health injuries stemming from the effects 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).[2]

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 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

[2] Hereinafter, when the Court refers to Defendants or the State, the PSC is excluded.

relationship between the permitted activities and the resulting environmental harms is reasonably close. *Bitterrooters for Planning, Inc. v. Mont. Dep't of Envtl.* 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 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 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 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. Envtl. Council v. Mont. Dep't of Envtl. 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.

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II. MONT. CODE ANN. § 75-1-201(6)(a)(ii) IS NOT A 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 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. *Galt 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 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.

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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 UNECESSARY 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 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 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

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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 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*, ¶ 74 (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 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.

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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 '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' 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 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 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 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 . . ..").

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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.

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 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.

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5. This judgment will influence the State's conduct by invalidating statutes prohibiting analysis and remedies based on GHG 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 in favor of the Plaintiffs as prevailing parties.

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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.

Kathy Seeley
District Court Judge

cc: Melissa Hornbein, via email: hornbein@westernlaw.org
Barbara Chillcott, via email: chillcott@westernlaw.org
Roger Sullivan, via email: rsullivan@mcgarveylaw.com
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KS/sm/CDV-2020-307 Held FCO

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department of Environmental Quality (Department). Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq.*, Montana Code Annotated (MCA).

   NWE shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility

9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}
11. ARM 17.8.230 Fluoride in Forage

NWE must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, NWE shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.316 Incinerators. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any incinerator, particulate matter in excess of 0.10 grains per standard cubic foot of dry flue gas, adjusted to 12% carbon dioxide and calculated as if no auxiliary fuel had been used. Further, no person shall cause or authorize to be discharged into the outdoor atmosphere from any incinerator emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes.

6. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. Sulfur Oxide Emissions-Sulfur in Fuel. This rule requires that no person shall cause, allow or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

7. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.

8. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). NWE is considered an NSPS affected facility under 40 CFR Part 60 and is subject to the requirements of the following subparts.

   a. 40 CFR 60, Subpart A – General Provisions apply to all equipment or facilities subject to an NSPS Subpart as listed below:

b. 40 CFR 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines Fossil Fuel-Fired Steam Generators.

c. 40 CFR 60, Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.

9. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. This source shall comply with the standards and provisions of 40 CFR Part 61, as appropriate.

a. 40 CFR 61, Subpart A – General Provisions apply to all equipment or facilities subject to a NESHAP Subpart as listed below:

10. ARM 17.8.342 – Emission Standards for Hazardous Air Pollutants for Source Categories. The source, as defined and applied in 40 CFR Part 63, shall comply with the requirements of 40 CFR Part 63, as listed below:

a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to a NESHAP Subpart as listed below:

b. 40 CFR 63, Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

D. ARM 17.8, Subchapter 4 – Stack Height and Dispersion Techniques, including, but not limited to:

1. ARM 17.8.401 Definitions. This rule includes a list of definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.402 Requirements. NWE must demonstrate compliance with the ambient air quality standards with a stack height that does not exceed Good Engineering Practices (GEP). The proposed height of the new or modified stack for NWE is below the allowable 65-meter GEP stack height.

E. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. NWE submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place

on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

F. ARM 17.8, Subchapter 7 – Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit modification to construct, modify, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant. NWE has a PTE greater than 25 tons per year of PM, PM_{10}, $PM_{2.5}$, NOx, CO and VOC, therefore an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, modification, or use of a source. NWE submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. NWE submitted an affidavit of publication of public notice for the May 12, 2021, of the Billings Gazette, a newspaper of general circulation in the City of Billings in Yellowstone County, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving NWE of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.760 Additional Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those applications that require an environmental impact statement.

12. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or modified source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

13. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

14. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

15. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.

16. ARM 17.8.770 Additional Requirements for Incinerators. This rule specifies the additional information that must be submitted to the Department for incineration facilities subject to 75-2-215, Montana Code Annotated (MCA).

G. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant

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subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source because this facility is not a listed source and the facility's PTE is below 250 tons per year of any pollutant (excluding fugitive emissions).

H. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing MAQP #5261-00 for NWE, the following conclusions were made:

a. The facility's PTE is greater than 100 tons/year.

b. The facility's PTE is greater than 10 tons/year for any one HAP and greater than 25 tons/year for all HAPs.

c. This source is not located in a serious PM_{10} nonattainment area.

d. This facility is subject to NSPS 40 CFR 60, Subpart A, Subpart IIII and Subpart JJJJ.

e. This facility is subject to NESHAP 40 CFR 63, Subpart A, and Subpart ZZZZ.

f. This source is not a Title IV affected source, or a solid waste combustion unit.

g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that NWE is subject to the Title V operating permit program.

II. BACT Determination

A BACT determination is required for each new or modified source. NWE shall install on the new or modified source the maximum air pollution control capability, which is technically practicable and economically feasible, except that BACT shall be utilized.

A BACT analysis was submitted by NWE in permit application #5261-00 addressing methods of controlling NOx, CO, VOC, PM, PM_{10}, $PM_{2.5}$ and SO_2 emissions from the RICE. The Department reviewed these methods, as well as previous BACT determinations. The following control options have been reviewed by the Department in order to make the following BACT determinations.

RICE BACT

Startup and Shutdown Operation

Startup emissions are a more frequent occurrence for "dispatchable" capacity than for baseload facilities as the engines will need to start-up and shutdown frequently. Available controls during startup include good combustion practices and minimizing the length of the start-up time. Start-ups are either identified as a warm or hot start-up or as a cold start-up. Warm and hot start-ups can take as little as 8 minutes to start and cold start-ups may take as long as 30 minutes. The SCR is programmed to begin controlling emissions as soon as ten minutes have elapsed into the start-up,

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but optimum emission reduction does not occur until steady state operation is achieved. For this reason, NWE is proposing that BACT for start-up conditions as well as for shutdown conditions are good combustion practices and minimizing start-up times and shutdown times. Expected emission rates during startup and shutdown are based on the manufacturer's testing of the engines in laboratory settings.

NOx BACT

NOx is primarily formed in combustion processes in three ways: thermal NOx, prompt NOx, and fuel NOx. Thermal NOx is formed by the combination of elemental nitrogen with oxygen in the combustion air within the high-temperature environment of the combustor. Prompt NOx is formed by reactions of nitrogen with hydrocarbon radicals from the fuel. Fuel NOx is formed by the oxidation of nitrogen contained in the fuel. Natural gas contains negligible amounts of fuel-bound nitrogen and hydrocarbon radicals, although some molecular nitrogen is present. It is assumed that NOx emissions from the engines primarily originate as thermal NOx. The rate of formation of thermal NOx is a function of residence time and free oxygen and increases exponentially with peak flame temperature. NOx emissions control techniques are aimed at controlling one or more of these variables during combustion. Controlling the air-to-fuel ratio can also reduce the amount of NOx.

Step 1 – Identify All Available NOx Control Technologies

Methods to control NOx from RICE include both intrinsic emissions control as well as add-on control. The intrinsic emissions control for NOx includes good combustion practices and proper operation, which falls into the category of lean-burn combustion. Add-on controls for NOx emissions from RICE include Non-Selective Catalytic Reduction (NSCR) and Selective Catalytic Reduction (SCR).

Lean-burn engines are designed to operate with excess oxygen, which means a lean fuel mixture. The proposed project includes Caterpillar lean-burn, four-stroke engines. In the lean-burn combustion process, natural gas and air are premixed in a low fuel/air ratio before being fed into the cylinders. The lean-burn process efficiently reduces NOx emissions due to a lower combustion temperature. The Caterpillar RICE are also equipped with turbo chargers which increase the volume of air in the combustion chamber. Lean-burn engines have inherently low NOx emissions upstream of any add-on NOx controls.

Other control methods utilize add-on equipment to remove NOx from the exhaust gas stream after its formation. The most common control techniques involve the injection of urea or ammonia into the gas stream to reduce the NOx to molecular nitrogen and water. Urea/ammonia is either injected into the engine combustion chamber (in the case of NSCR) or injected with the use of a catalyst (SCR).

Step 2 - Eliminate Technically Infeasible Options

Lean Burn Combustion

The proposed RICE are lean-burn, four-stroke engines. Lean-burn engines may operate up to the lean flame extinction limit, with exhaust oxygen levels of 12 percent or greater. The air-to-fuel ratios of lean-burn engines range from 20:1 to 50:1 and are typically higher than 24:1. The Caterpillar lean-burn engines can also be characterized as "clean- burn" engines. Engines operating at high air-to-fuel ratios (greater than 30:1) may require combustion modification to promote stable combustion

with the high excess air. The RICE are designed with a turbocharger which is used to force more air than normally aspirated engines into the combustion chamber. Lean-burn combustion is technically feasible for application to the RICE.

NSCR

NSCR is an add-on/post-combustion technology that uses the residual hydrocarbons and CO in rich-burn engine exhaust as a reducing agent for NOx. In an NSCR, hydrocarbons and CO are oxidized by oxygen (O_2) and NOx. The excess hydrocarbons, CO and NOx, pass over a catalyst (usually a noble metal such as platinum, rhodium, or palladium) that reduces NOx to N_2. The NSCR technique is effectively limited to engines with normal exhaust oxygen levels of four percent or less. This includes four-stroke rich- burn naturally aspirated engines and some four-stroke rich-burn turbo-charged engines. Engines operating with NSCR require tight air-to-fuel control to maintain high reduction effectiveness without high hydrocarbon emissions. To achieve effective NOx reduction performance, the engine may need to be run with a richer fuel adjustment than normal. This exhaust excess oxygen level would probably be closer to one percent. The proposed lean-burn engines could not be retrofitted with NSCR control because of the reduced exhaust temperatures. NSCR is not considered to be technically feasible for application to the lean-burn RICE and is eliminated from further consideration.

SCR

SCR is an add-on/post-combustion technology that has been shown to be effective in reducing NOx in exhaust from RICE. An SCR system consists of an ammonia or urea storage, feed, and injection system, and a catalyst and catalyst housing. SCR systems selectively reduce NOx emissions by injecting ammonia or urea into the exhaust gas stream upstream of the catalyst. NOx, NH_3, and O_2 react on the surface of the catalyst to form N_2 and H_2O. For the SCR system to operate properly, the exhaust gas must be within a particular temperature range (typically between 450°F and 850°F). The temperature range is dictated by the catalyst (typically made from noble metals, base metal oxides such as vanadium and titanium, and zeolite-based material). Exhaust gas temperatures greater than the upper limit (850°F) will pass the NOx and NH_3 unreacted through the catalyst prior to the reaction.

SCR represents state-of-the-art controls for lean-burn four-stroke engine NOx removal. Because SCRs are commercially available and have been used on engines of this size and type, SCR is technically feasible for application to the RICE.

Step 3 - Rank Control Technologies by NOx Control Effectiveness

The table below shows the NOx reductions rates for both SCR and lean burn combustion. The designed NOx removal efficiency for SCR is approximately 90 to 94% depending on NOx inlet. Ranking of the control technologies was based on an emission rate in terms of lb/hr and grams per horsepower-hour (g/hp-hr). Ranking the control technologies in this manner provides a comparison to levels in the EPA RACT/BACT/LAER Clearinghouse (RBLC).

Table: Ranked NOx Control Technology Effectiveness

Control Technology	NOx Reduction (% control)	NOx Emission Rate (lb/hr)	NOx Emission Rate (g/bhp-hr)
SCR	90-94%	1.70	0.059
Lean-Burn Combustion	Baseline	27.22	0.948

Step 4 - Evaluate Most Effective NOx Controls and Document Results

The next step in the top-down BACT analysis is to review each of the technically feasible control options for environmental, energy, and economic impacts. First, all technically feasible controls will be discussed for environmental and energy impacts. Next, if the top control is not chosen, an economic analysis to determine capital and annual control costs in terms of cost-effectiveness (i.e., dollars per ton of pollutant removed) of each control system would be conducted. Because NWE has selected the top control (SCR), the following information is presented for informational purposes only.

SCR

Energy Impacts

As with all add-on controls, operation of an SCR system results in a loss of energy (also referred to as "parasitic load") due to the pressure drop across the SCR catalyst. To compensate for the energy loss in the SCR system, additional fuel combustion is required to maintain the net energy output, which also results in additional air pollutant emissions. The extra fuel required for the controls does not outweigh the benefit of reducing emissions of NOx.

Environmental Impacts

Ammonia will be used in the SCR. The SCR system consists of an ammonia injection system and a catalytic reactor. Unreacted ammonia may escape through to the exhaust gas. This is commonly called "ammonia slip." It is estimated that ammonia slip from an SCR on these engines could be up to 5 ppm, volumetric dry (ppmvd); this may be considered as an environmental impact (per the manufacturer's specifications). The ammonia that is released may also react with other pollutants in the exhaust stream to create fine PM in the form of ammonium salts, which is accounted for in the PM emissions estimate. SCR catalysts must also be replaced on a routine basis, and appropriately disposed of either in a landfill or by being recycled back to the manufacturer.

None of these impacts outweighs the benefit of reducing emissions of NOx because of the environmental and health benefits of reducing NOx emissions.

Economic Impacts

As SCR is being chosen and is the top control technology listed, no further economic discussion is necessary.

Lean-Burn Combustion

Energy Impacts

Lean-burn combustion is usually accompanied by an efficiency penalty (typically two to three percent) and an increase in power output (typically five to six percent). The increase in power output results from the increase in mass flow required to maintain engine inlet temperature at manufacturer's specifications. Because the associated power output increase offsets the efficiency penalty, no net energy impacts are associated with lean-burn combustion.

Environmental Impacts

Lean-burn combustion may increase CO and VOC emissions. However, this increase does not outweigh the advantage of decreased NOx emissions. CO and VOC emissions are addressed later in this BACT analysis.

Economic Impacts

Lean-burn combustion is intrinsic to the design of the Caterpillar RICE. Because lean-burn combustion is standard on the engines, no further economic analysis is necessary.

Step 5 – Select NOx BACT

Based on the information and analysis above, NOx BACT for the Caterpillar RICE is lean-burn combustion and the addition of SCR, the most effective available control. NWE proposed a maximum NOx emission limit of 1.70 lb/hr from each engine firing natural gas as steady-state BACT for this application based on a one-hour average. This rate is equivalent to 0.059 g/hp-hr for natural gas based on nominal hp ratings. RBLC entries for RICE are shown below. BACT determinations shown in the RBLC for engines that are in the 500 hp and greater size range located in attainment areas were in the range of 0.05 to 2.0 g/bhp-hr using lean-burn combustion and/or SCR for natural gas-fired engines. The proposed NOx emission limits for the RICE would be among the lowest emission rates listed in the RBLC.

RBLC ID	PERMIT DATE	CORPORATE/COMPANY NAMEFACILITY NAME	DESCRIP-TION	NOx POLLU-TION CONTROL	NOx EMISSION LIMIT (g/bhp-hr)	AVG PERIOD
KS-0035	01/24/2014	TRADEWIND ENERGY INC LACEYRANDALL GENERATINGSTATION	12,526 hp RICE	SCR	0.05	---
KS-0020	03/31/2016	MID-KANSAS ELECTRIC COMPANY,LLC - RUBART STATION	13,410 hp RICE	SCR	0.072	---
TX-0692	12/20/2013	SOUTH TEXAS ELECTRIC COOPERATIVE, INC. – RED GATEPOWER PLANT	18 MW RICE	SCR	0.084	---
CA-1222	9/22/2011	KYOCERA AMERICA INC;	2,328 hp RICE	SCR with process control NOx monitor	0.1	--

RBLC ID	PERMIT DATE	CORPORATE/COMPANY NAMEFACILITY NAME	DESCRIP-TION	NOx POLLU-TION CONTROL	NOx EMISSION LIMIT (g/bhp-hr)	AVG PERIOD
PA-0287	9/27/2011	MARKWEST LIBERTY MIDSTREAM &RESOURCES – WELLING COMPRESSOR STATION	1,980 hp RICE	3-way catalyst	0.2	--
LA-0292	01/22/2016	CAMERON INTERSTATE PIPELINELLC - HOLBROOK COMPRESSOR STATION	5,000 hp RICE	None	0.45	---
TX-0755	05/21/2015	DELAWARE BASIN MIDSTREAM LLC – RAMSEY GAS PLANT	41,229 MMBtu/ hrRICE	None	0.5	---
PA-0301	03/31/2014	MARKWEST LIBERTY MIDSTREAM &RESOURCES, LLC - CARPENTER COMPRESSOR STATION	3,550 hp RICE	AFR controller	0.5	---
MI-0440	05/22/2019	MICHIGAN STATE UNIVERSITY	16,500 hp RICE	SCR	0.5	---
TX-0680	06/04/2013	WTG SONORA GAS PLANT LLCSONORA GAS PLANT	1,380 hp RICE	ULNB	0.5	---
PA-0297	05/23/2013	KELLY IMG ENERGY LLC/KELLY IMGPLT	3.11 MW RICE	None	0.5	---
OK-0153	05/23/2013	KELLY IMG ENERGY LLC/KELLY IMGPLT	1,775 hp RICE	None	0.5	3-hour avg
MI-0393	10/14/2010	CONSUMERS ENERGY RAYCOMPRESSOR STATION	4,735 hp RICE	None	0.5	--
OK-0148	09/12/2012	MARKWEST BUFFALO CREEK GAS CO – BUFFALO CREEK PROCESSINGPLANT	2,370 hp RICE	None	0.55	---
LA-0257	12/06/2011	SABINE PASS LNG, LP – SABINEPASS LNG TERMINAL	2,012 hp RICE	Comply withNSPS JJJJ	2.0	--

The selection of these emissions values as BACT is justified via the vendor-provided emissions estimates and comparisons to the RBLC. The proposed NOx BACT conforms to previous BACT determinations made by MDEQ for RICE combusting natural gas.

CO BACT

CO emissions are a product of incomplete combustion. CO results when insufficient residence time at high temperature results in lack of completion of the final step in hydrocarbon oxidation. In RICE, CO emissions may indicate early quenching of combustion gases on cylinder walls or valve surfaces. CO emissions from engines are a function of oxygen availability (excess air), flame temperature, residence time at flame temperature, combustion zone design, and turbulence. Control of CO is normally accomplished by providing adequate fuel residence time and a high temperature in the combustion zone to ensure complete combustion. As previously mentioned, lean-burn engines typically have higher CO emissions and lower NOx emissions due to the air-to-fuel ratios at which they operate.

Step 1 – Identify All Available CO Control Technologies

Methods to control CO from RICE include both combustion control to prevent CO formation as well as add-on control. Available combustion emissions control for CO includes good combustion practices/proper operation (i.e., controlling the combustion process to suppress CO formation and monitoring that process through the air-to-fuel ratio). Add-on control for CO emissions from RICE involves the use of catalytic oxidation.

Step 2 - Eliminate Technically Infeasible Options

Good Combustion Practices/Control

Good combustion practices/control include operational and engine design elements to control the amount and distribution of excess air in the flue gas to ensure that there is enough oxygen present for complete combustion (controlling the air-to-fuel ratio). Good combustion practices are technically feasible for controlling CO emissions from the RICE.

Catalytic Oxidation

Oxidation catalysts are a post-combustion technology that does not rely on the introduction of additional chemicals for a reaction to occur. The oxidation of CO to CO_2 utilizes excess air present in the engine exhaust; the activation energy required for the reaction to proceed is lowered in the presence of a catalyst. Products of combustion are introduced into a catalytic bed, with the optimum temperature range for these systems being between 700°F and 1,100°F. At higher temperatures, catalyst sintering may occur, potentially causing permanent damage to the catalyst. The addition of a catalyst bed onto the engine exhaust will create a pressure drop, resulting in back pressure to the engine. This has the effect of reducing the efficiency of the engine and power generating capabilities. Catalytic oxidation is a technically feasible CO control technology for RICE.

Step 3 - Rank Control Technologies by CO Control Effectiveness

The table below lists the CO control technologies and emission rates for the technically feasible CO control options. Technically feasible control alternatives that remain are catalytic oxidation and good combustion practices. The designed CO removal efficiency for catalytic oxidation is 90-95% depending on the CO inlet for natural gas combustion. Ranking of the control technologies was based on an emission rate in terms of lb/hr and g/hp-hr (provided only for the purpose of comparing to emission levels in the RBLC).

Control Technology	**CO Reduction (% control)**	**CO Emission Rate (lb/hr)**	**CO Emission Rate (g/bhp-hr)**
Catalytic Oxidation	90-95%	1.59	0.055
Good Combustion Practices/Control (baseline)	Baseline	22.60	0.788

Step 4 - Evaluate Most Effective CO Controls and Document Results

The next step in the top-down BACT analysis is to review each of the technically feasible control options for environmental, energy, and economic impacts. First, all technically feasible controls will be discussed for environmental and energy impacts. Next, if the top control is not chosen, an economic analysis to determine capital and annual control costs in terms of cost-effectiveness (i.e., dollars per ton of pollutant removed) of each control system would be conducted. Because NWE has selected the top control (catalytic oxidation) in addition to good combustion practices/control, the following information is presented for informational purposes only.

Catalytic Oxidation

Energy Impacts

The addition of a catalyst bed onto the engine exhaust for the oxidation catalyst will create additional pressure drop, resulting in increased back pressure to the engine. This has the effect of reducing the efficiency of the engine and the power generating capabilities (parasitic load). These effects are considered minor compared to the reduction in CO (and VOC, see further discussion below) emissions from the use of an oxidation catalyst.

Environmental Impacts

The oxidation catalyst oxidizes CO to CO_2 which is released to the atmosphere. In addition, as with all controls that utilize catalysts for removal of pollutants, the catalyst must be disposed of after it is spent. The catalyst may be considered hazardous waste and require special treatment or disposal; even if it is not hazardous, it will add minor waste volume to landfills. The health and environmental benefits of reducing CO emissions outweigh these other environmental impacts.

Economic Impacts

As catalytic oxidation is being chosen and is the top control technology listed, no further economic discussion is necessary.

Good Combustion Practices/Control

Energy, Environmental, and Economic Impacts

Combustion controls are an intrinsic control designed to reduce pollution and increase efficiency of the engines. There are no energy, environmental, or economic impacts from this process. There is no "add-on" equipment associated with this control technology, and there is no capital cost associated with this control.

Step 5 – Select CO BACT

Based on the information and analysis above, CO BACT for the Caterpillar RICE is good combustion control and the addition of an oxidation catalyst, the most effective available control. RBLC entries for CO are shown in the below table.

RBLC ID	PERMIT DATE	CORPORATE/COMPANY NAME FACILITY NAME	DESCRIPTION	CO POLLUTION CONTROL	CO EMISSION LIMIT (g/bhp-hr)	AVG PERIOD
PA-0297	05/23/2013	KELLY IMG ENERGY LLC/KELLY IMG PLT	3.11 MW RICE	CO Catalyst	0.08	---
TX-0755	05/21/2015	DELAWARE BASIN MIDSTREAM LLC – RAMSEY GAS PLANT	41,229 MMBtu/hr RICE	Oxidation Catalyst	0.083	---
KS-0035	01/24/2014	TRADEWIND ENERGY INC LACEYRANDALL GENERATING STATION	12,526 hp RICE	Oxidation Catalyst	0.10	---
PA-0287	9/27/2011	MARKWEST LIBERTY MIDSTREAM & RESOURCES – WELLING COMPRESSOR STATION	1,980 hp RICE	Oxidation Catalyst	0.12	--
KS-0030	03/31/2016	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	13,410 hp RICE	Oxidation Catalyst	0.13	---
TX-0680	06/04/2013	WTG SONORA GAS PLANT LLC SONORA GAS PLANT	1,380 hp RICE	Oxidation Catalyst	0.252	---
TX-0692	12/20/2013	SOUTH TEXAS ELECTRIC COOPERATIVE, INC. – RED GATE POWER PLANT	18 MW RICE	Oxidation Catalyst	0.30	---
MI-0440	05/22/2019	MICHIGAN STATE UNIVERSITY	16,500 hp RICE	Oxidation Catalyst	0.3	---
OK-0153	03/01/2013	SEMGAS LP – ROSE VALLEY PLANT	1,775 hp RICE	Oxidation Catalyst	0.36	3-hour avg
OK-0148	09/12/2012	MARKWEST BUFFALO CREEK GAS CO – BUFFALO CREEK PROCESSING PLANT	2,370 hp RICE	Oxidation Catalyst	0.55	---
LA-0257	12/06/2011	SABINE PASS LNG, LP – SABINE PASS LNG TERMINAL	2,012 hp RICE	Comply with NSPS JJJJ	4.4	--

NWE proposes that a maximum CO emission limit of 1.59 lb/hr per engine firing natural gas is steady-state BACT for this application based on a one-hour average. This rate is equivalent to 0.055 g/hp-hr for natural gas based on nominal hp ratings. The proposed CO BACT conforms to previous BACT determinations for RICE and is consistent with the RBLC. BACT determinations shown in the RBLC for engines that are in the 500 hp and greater size range located in attainment areas were in the range of 0.08 g/bhp-hr to 4.4 g/bhp- hr using either lean-burn combustion and/or oxidation catalyst/CO catalyst for natural gas-fired engines. During start-up and shutdown, higher levels of CO would occur and minimizing the number of startup and shutdown events will reduce emissions during these transient periods when the oxidation catalyst and other conditions are not optimum for CO control. Therefore, in addition to good combustion practices, restricting the total number of startup and shutdown events would represent BACT. The proposed CO steady state emission limits for the RICE would be the lowest emission rate as compared to those listed in the RBLC.

VOC BACT

Like CO, VOC emissions are a product of incomplete combustion. VOC emissions occur when some gas remains unburned or is only partially burned during the combustion process. With natural gas, some organics are unreacted trace constituents of

the gas, while others may be products of the heavier hydrocarbon constituents. Partially burned hydrocarbons result from inadequate air-to-fuel mixing before or during combustion or inefficient air-to-fuel ratios in the cylinder during combustion due to engine settings of the fuel system. Lean-burn engines typically have higher VOC emissions than rich-burn engines due to the respective air-to-fuel ratios at which they operate. The VOC emissions and BACT analysis are inclusive of formaldehyde.

Step 1 – Identify All Available VOC Control Technologies

The technologies identified for reducing VOC emissions from the RICE are the same as those identified for CO control: an oxidation catalyst and good combustion practices/control. The standard technology for reducing VOC emissions is to maintain "good combustion" through proper control and monitoring of the combustion process through the air-to-fuel ratio. An RBLC review indicates that oxidation catalysts are the predominant control listed as BACT for VOC.

Step 2 - Eliminate Technically Infeasible Options

Good Combustion Practices/Control

"Good combustion practices/control" include operational and engine design elements to control the amount and distribution of excess air in the flue gas to ensure that there is enough oxygen present for complete combustion (controlling the air-to-fuel ratio). Good combustion practices are technically feasible for controlling VOC emissions from the RICE.

Catalytic Oxidation

Oxidation catalysts are a post-combustion technology that do not rely on the introduction of additional chemicals for a reaction to occur. The oxidation of VOC to H_2O and CO_2 utilizes excess air present in the engine exhaust; the activation energy required for the reaction to proceed is lowered in the presence of a catalyst. Products of combustion are introduced into a catalytic bed, with an optimum temperature range for these systems of 700°F to 1,100°F. At higher temperatures, catalyst sintering may occur, potentially causing permanent damage to the catalyst. The addition of a catalyst bed onto the engine exhaust will create a pressure drop, resulting in back pressure to the engine. This has the effect of reducing the efficiency of the engine and power generating capabilities.

Catalytic oxidation is a technically feasible control technology for controlling VOC emissions from the RICE.

Step 3 - Rank Control Technologies by VOC Control Effectiveness

The table below lists the VOC control technologies and emission rates for the technically feasible VOC control options. Technically feasible control alternatives that remain are catalytic oxidation and good combustion practices/control. The designed VOC removal efficiency for catalytic oxidation is approximately 22 to 50% (90-95% for formaldehyde) depending on the VOC (and formaldehyde) inlet for natural gas combustion. Ranking of the control technologies was based on an emission rate in terms of lb/hr and g/hp-hr (provided only for the purpose of comparing to emission

levels in the RBLC).

Control Technology	VOC Reduction (% control)	VOC Emission Rate (lb/hr)	VOC Emission Rate (g/bhp-hr)
Catalytic Oxidation	22-55% for VOC 90-95% for formaldehyde	2.44	0.085
Good Combustion Practices/Control (baseline)	Baseline	6.97	0.244

Step 4 - Evaluate Most Effective VOC Controls and Document Results

The next step in the top-down BACT analysis is to review each of the technically feasible control options for environmental, energy, and economic impacts. First, all technically feasible controls will be discussed for environmental and energy impacts. Next, if the top control is not chosen, an economic analysis to determine capital and annual control costs in terms of cost-effectiveness (i.e., dollars per ton of pollutant removed) of each control system would be conducted. Because NWE has selected the top control (catalytic oxidation) in addition to good combustion practices/control, the following information is presented for informational purposes only.

Catalytic Oxidation

Energy Impacts

The addition of a catalyst bed onto the engine exhaust for the oxidation catalyst will create additional pressure drop, resulting in increased back pressure to the engine. This has the effect of reducing the efficiency of the engine and the power generating capabilities (parasitic load). These effects are considered minor compared to the reduction in VOC emissions (see further discussion below) from the use of an oxidation catalyst.

Environmental Impacts

The oxidation catalyst oxidizes VOC to H_2O and CO_2 which is released to the atmosphere. In addition, as with all controls that utilize catalysts for removal of pollutants, the catalyst must be disposed of after it is spent. The catalyst may be considered hazardous waste and require special treatment or disposal; even if it is not hazardous, it will add minor waste volume to landfills. The health and environmental benefits of reducing VOC emissions outweigh these other environmental impacts. In addition, the oxidation catalyst is also effective at reducing formaldehyde emissions at a level similar to that of VOCs. Formaldehyde is also regulated for this facility under 40 CFR 63, Subpart ZZZZ. The RICE will be subject to a formaldehyde emissions limit of either 14 ppmvd or a minimum of 93% reduction at 15% O_2 in CO emissions as a surrogate under that standard.

Impacts

As catalytic oxidation is being chosen and is the top control technology listed, no

further economic discussion is necessary.

Good Combustion Practices/Control

Energy, Environmental, and Economic Impacts

Combustion controls are designed to reduce the formation of pollutants and increase efficiency of the engines. There are no energy, environmental, or economic impacts resulting from improved combustion controls. There is no "add-on" equipment associated with this control technology, and there is no capital cost associated with this control.

Step 5 – Select VOC BACT

Based on the information and analysis above, VOC BACT for the Caterpillar RICE is good combustion practices/control and the addition of oxidation catalyst (representing the highest level of control). NWE proposes a steady state maximum VOC emission limit of 2.44 lb/hr for VOCs including formaldehyde per engine firing natural gas is steady-state BACT for this application based on a one-hour average. This rate is equivalent to 0.085 g/hp-hr for full load operation (based on nominal hp ratings). During start-up and shutdown, higher levels of VOCs would occur and minimizing the number of startup and shutdown events will reduce emissions during these transient periods when the oxidation catalyst and other conditions are not optimum for VOC control. Therefore, in addition to good combustion practices, restricting the total number of startup and shutdown events would represent BACT. RBLC entries for RICE are shown below.

RBLC ID	PERMIT DATE	CORPORATE/COMPANY NAME FACILITY NAME	DESCRIPTION	VOC POLLUTION CONTROL	VOC EMISSION LIMIT (g/bhp-hr)	AVG PERIOD
TX-0755	05/21/2015	DELAWARE BASIN MIDSTREAM LLC – RAMSEY GAS PLANT	41,229 MMBtu/hr RICE	Oxidation Catalyst	0.091	---
KS-0035	01/24/2014	TRADEWIND ENERGY INC LACEYRANDALL GENERATING STATION	12,526 hp RICE	Oxidation Catalyst	0.10	---
LA-0292	01/22/2016	CAMERON INTERSTATE PIPELINE INC – HOLBROOK COMPRESSOR STATION	5,000 hp RICE	Oxidation Catalyst	0.11	---
PA-0287	9/27/2011	MARKWEST LIBERTY MIDSTREAM & RESOURCES – WELLING COMPRESSOR STATION	1,980 hp RICE	Oxidation Catalyst	0.12	--
OK-0153	03/01/2013	SEMGAS LP – ROSE VALLEY PLANT	1,775 hp RICE	Oxidation Catalyst	0.13	3-hour avg
CA-1222	9/22/2011	KYOCERA AMERICA INC	2,328 hp RICE	Oxidation Catalyst	0.15	--
PA-0297	05/23/2013	KELLY IMG ENERGY LLC/KELLY IMG PLT	3.11 MW RICE	CO Catalyst	0.176	---

RBLC ID	PERMIT DATE	CORPORATE/COMPANY NAME FACILITY NAME	DESCRIPTION	VOC POLLUTION CONTROL	VOC EMISSION LIMIT (g/bhp-hr)	AVG PERIOD
MI-0393	10/14/2010	CONSUMERS ENERGY – RAY COMPRESSOR STATION	4,735 hp RICE	Oxidation Catalyst	0.19	--
KS-0030	03/31/2016	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	13,410 hp RICE	Oxidation Catalyst	0.20	---
TX-0680	06/04/2013	WTG SONORA GAS PLANT LLC SONORA GAS PLANT	1,380 hp RICE	Oxidation Catalyst	0.245	---
PA-0301	03/31/2014	MARKWEST LIBERTY MIDSTREAM & RESOURCES, LLC - CARPENTER COMPRESSOR STATION	3,550 hp RICE	Oxidation Catalyst	0.25	---
TX-0692	12/20/2013	SOUTH TEXAS ELECTRIC COOPERATIVE, INC. – RED GATE POWER PLANT	18 MW RICE	Oxidation Catalyst	0.30	---
MI-0440	05/22/2019	MICHIGAN STATE UNIVERSITY	16,500 hp RICE	Oxidation Catalyst	0.7	---

The selection of these emissions values as BACT is justified via the vendor-provided emissions estimates and the RBLC entries. The proposed VOC BACT conforms to previous BACT determinations made by MDEQ for natural gas combustion units and conforms to the RBLC search as shown in the table below. As previously mentioned, the VOC BACT includes control of formaldehyde emissions. BACT determinations shown in the RBLC above for engines that are in the 500 hp and greater size range located in attainment areas were in the range of 0.091 g/bhp-hr to 0.7 g/bhp-hr using catalytic oxidation for natural gas-fired engines. The proposed VOC (with formaldehyde) emission limits for the RICE would be the lowest emission rate as compared to those listed in the RBLC.

SO_2 BACT

SO_2 emissions from natural gas combustion are directly attributed to fuel sulfur content: either sulfates from fuel sulfur or mercaptans used as odorants. No additional sulfur originates from the process. The total potential emissions for SO_2 are 0.79 tpy per unit and 14.2 tpy for all 18 Caterpillar RICE.

Because of the extremely low sulfur concentrations and resulting large costs per ton of SO_2 removed, post-combustion controls, such as flue gas desulfurization units ("scrubbers"), have not been applied to commercial natural gas engines. In addition, no vendors of the RICE considered for meeting NWE's dispatchable power needs have identified any similar engines that have SO_2 control devices. The RBLC search includes no additional control, use of pipeline quality natural gas, and good combustion practices. The use of add-on SO_2 control such as scrubbers is both technically infeasible and does not represent available control technology.

NWE proposes that the use of proper combustion practices coupled with the use of pipeline quality natural gas is steady-state BACT. This is expected to provide a maximum SO_2 emission limit of 0.17 lb/hr per engine based on a one- hour average. The proposed SO_2 BACT conforms to previous BACT determinations made by MDEQ for natural gas combustion units.

$PM/PM_{10}/PM_{2.5}$ BACT

Particulate matter (PM) (including total particulate, PM_{10} and $PM_{2.5}$) emissions from natural gas combustion sources consist of several components. These can include inert contaminants in natural gas, sulfates from fuel sulfur or mercaptans used as odorants, dust drawn in from the ambient air, and particulate of carbon and hydrocarbons resulting from incomplete combustion. Units firing fuels with low ash content (such as pipeline quality natural gas) and high combustion efficiency exhibit correspondingly low particulate emissions.

Because of their extremely low particulate concentrations and resulting large costs per ton of particulate matter removed, post-combustion controls, such as electrostatic precipitators (ESPs) or baghouses, have not been applied to commercial gas-fired engines. In addition, no vendors of the RICE considered for meeting NWE's dispatchable power needs have identified any similar engines that have particulate control devices. No add-on controls for PM were found in the RBLC search. The use of add-on particulate control such as ESPs or baghouses is both technically infeasible and does not represent available control technology in use for these types of units.

NWE proposes that a maximum PM/PM_{10} emission limit of 0.96 lb/hr per engine and a maximum $PM_{2.5}$ emission limit of 0.36 lb/hr per engine, achieved through the use of proper generating unit design and operation coupled with the use of pipeline quality natural gas, is steady-state BACT for this application based on a one-hour average. This limitation includes both filterable and condensable $PM/PM_{10}/PM_{2.5}$ emissions. The proposed $PM/PM_{10}/PM_{2.5}$ BACT conforms to previous BACT determinations made by MDEQ for natural gas combustion units.

Emergency Generator

NWE is proposing to use minimum EPA Tier II and III rated engines (for the backup emergency generator and the emergency fire pump engine, respectively). Therefore, both engines are subject to the EPA Tier/nonroad standards as well as the backup emergency generator being subject to NSPS Subpart IIII for RICE. In addition, the two engines would both be limited in use (maximum of 300 hours per year) based on their emergency status.

BACT for these engines is compliance with those applicable requirements. The proposed BACT conforms to previous BACT determinations made by MDEQ for similar-sized diesel engines.

Dew Point Heater

The Dew Point Heater is a small natural gas-fired heater, rated at 1.11 MMBtu/hr. The highest criteria pollutant emission rates for this heater are 0.38 tpy of CO and 0.46 tpy of NOx. Based on the small size of the heater and the minimal emissions generated, no add-on control technology would be economically feasible. Emissions of all criteria pollutants will be minimized through the combustion of natural gas and by following good combustion practices for this unit.

The combustion of pipeline quality natural gas and following good combustion practices is proposed as BACT for the Dew Point Heater. The proposed BACT conforms to previous BACT determinations made by MDEQ for similar sized natural gas heaters.

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

III. Emission Inventory

Laurel Generating Station Potential to Emit							
	Total PM (tpy)	Total PM_{10} (tpy)	Total $PM_{2.5}$ (tpy)	NO_X (tpy)	SO_2 (tpy)	CO (tpy)	VOC[a] (tpy)
Engines (Total)	75.5	75.5	28.3	217.3	14.1	243.4	214.8
Emergency Generator	0.1	0.1	0.1	4.3	0.0	2.3	0.3
Firepump Engine	0.0	0.0	0.0	0.3	0.0	0.3	0.1
Dew Point Heater	0.0	0.0	0.0	0.5	0.0	0.4	0.0
Fugitive Road Dust	0.3	0.1	0.0	-	-	-	-
Totals	75.9	75.7	28.4	222.4	14.1	246.4	215.2
a VOC emissions include formaldehyde							

Total PM_{10} emissions include PM10(fil) + PM(cond)
Total $PM_{2.5}$ emissions include PM10(fil) + PM(cond)
Total Particulate Matter emissions include PM(fil) + PM(cond)
CO = carbon monoxide
(fil) = filterable
HAPs = hazardous air pollutants
hp = horsepower
lb = pound
NO_X = oxides of nitrogen
PM = particulate matter
PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less
$PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 microns or less
SO_2 = sulfur dioxide
TPH = tons per hour
TPY = tons per year
VOC = volatile organic compounds
yr = year

Footnotes:

Inventory for the RICE reflects maximum allowable emissions for all pollutants based on maximum production and year-round operation (8,760 hours). The facility did not take limits on production or hours of operation. There are assumptions built into the 8,760 hours regarding the number of start-up and shutdown events for each engine on an annual basis. Hours of normal operation per year is 8,515 hours of normal operation with 245 hours of startup and shutdown each year. Emission calculations are based on normal operation plus emissions from both startup and shutdown events. Startup events are divided into cold startups and warm startups. The emergency generator and fire-pump engine are each expected to operate up to 300 hours per year.

Fuel Characteristics

Natural Gas

Higher Heating Value	22421	btu/lb
	1086	btu/scf
Sulfur Content	0.005	grains/scf
Carbon Content	70	% wt

40 CFR 98 Table C-1 Emission Factors		
CO2	53.06	kg /mmBtu
	117.0	lb/mmBtu
CH4	1.0E-03	kg /mmBtu
	0.0022	lb/mmBtu
N2O	1.0E-04	kg /mmBtu
	0.00022	lb/mmBtu

Source and Performance Parameters

max hours of operation	8760	hours/year
Hours of Operation - NG	8515	hours/year
Hours of Startup/Shut Down	245	hours/year
Startup/Shut Down per Unit (total)	1825	events/year
Number of Units	18	
Performance Safety Margin	0%	
Horsepower rating (per unit)	13008	hp

Emissions Summary - Baseload

Pollutant	Description		Max Emissions	Converted to g/bhp-hr
Total PM/PM_{10} (Filterable + Condensible)	Vendor	lb/mmBtu		
	Cat Guarantee	**lb/hr**	0.96	0.033
Total $PM_{2.5}$ (Filterable + Condensible)	Cat. Guarantee	**lb/mmBtu**		
	Cat Guarantee	**lb/hr**	0.36	0.013
NOx as NO_2	Vendor	lb/mmBtu		
	Cat Guarantee	**lb/hr**	1.70	0.059
SO_2	Vendor	lb/mmBtu		
	Cat Guarantee	**lb/hr**	0.17	0.006
CO	Vendor	lb/mmBtu		
	Cat Guarantee	**lb/hr**	1.59	0.055
VOC	Vendor	lb/mmBtu		
	Cat Guarantee	**lb/hr**	2.00	0.070
Formaldehyde	Vendor	**lb/hr**	0.44	
	Calculated	lb/MMBtu		0.015
CO_2	Vendor	lb/MWh gross		
	Vendor	**lb/hr**		
	calculated from power output	lb/hr		
	40 CFR 98 Table C-1	lb/hr		

	Maximums	lb/hr	9753	
	calculated from heat input	lb/MMBtu		
CH_4	40 CFR 98 Table C-1	lb/hr	0.18	
N_2O	40 CFR 98 Table C-1	lb/hr	0.018	

Annual emissions			
Pollutant	Max mass emissions rate (lb/hr)	Max PTE w/SUSD Case (tpy)	18 engines (tpy)
Total PM PM10 (Filterable + Condensible)	0.96	4.2	75.5
Total PM2.5 (Filterable + Condensible)	0.36	1.6	28.3
NOx as NO2	1.70	12.1	217.3
SO_2	0.17	0.8	14.1
CO	1.59	13.5	243.4
VOC	2.00	9.2	165.4
Formaldehyde	0.44	2.7	49.4

Backup emergency generator

Diesel S content =	0.015	%
Horsepower =	2682	bhp
Hours of Operation =	300	hr/yr
Max. Fuel Combustion Rate =	18.774	MMBtu/hr
Fuel Heating Value=	1000	MMBtu/MMscf
Avg BSFC =	7000	Btu/hp-hr

Pollutant	**Emission Factor**	**Units**	**Emission Factor Reference**	**Potential Emissions (ton/yr)**
PM/PM10/PM2.5	0.15	g/bhp-hr	EPA Tier II	0.13
NOx	4.8	g/bhp-hr	EPA Tier II	4.26
CO	2.6	g/bhp-hr	EPA Tier II	2.31
SOx	0.000012	lb/bhp-hr	AP-42 Table 3.4-1 (10/96)	0.0049
VOC	7.05E-04	lb/bhp-hr	AP-42 Table 3.4-1 (10/96)	0.28
CO_2	1.160000	lb/bhp-hr	AP-42 Table 3.4-1 (10/96)	466.67
CH_4	0.000705	lb/bhp-hr	AP-42 Table 3.4-1 (10/96)	0.28
N_2O	0.000600	kg/MMBtu	40 CFR 98, Subpart C, Table C-2	0.00
CO_{2e}	-			474.87
HAPs	See table below			0.01

Hazardous Air Pollutants (HAPs)

Pollutant	CAS No.	Emission Factor	Units	Emission Factor Reference	Potential Engine Emissions (ton/yr)
Benzene	71-43-2	7.76E-04	lb/MMBtu	AP-42, Table 3.4-3	2.19E-03
Toluene	87-86-5	2.81E-04	lb/MMBtu	AP-42, Table 3.4-3	7.91E-04
Xylenes	1330-20-7	1.93E-04	lb/MMBtu	AP-42, Table 3.4-3	5.44E-04
Propylene	115-07-1	2.79E-03	lb/MMBtu	AP-42, Table 3.4-3	7.86E-03
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	AP-42, Table 3.4-3	2.22E-04
Acetaldehyde	91-20-3	2.52E-05	lb/MMBtu	AP-42, Table 3.4-3	7.10E-05
Acrolein	107-02-8	7.88E-06	lb/MMBtu	AP-42, Table 3.4-3	2.22E-05
				Totals	**1.17E-02**

Backup emergency fire pump engine

Diesel S content	0.015	%
Horsepower =	315	bhp
Hours of Operation =	300	hr/yr
Max. Fuel Combustion Rate =	2.21	MMBtu/hr
Fuel Heating Value=	1000	MMBtu/MMscf
Avg BSFC =	7000	Btu/hp-hr

Pollutant	Emission Factor	Units	Emission Factor Reference	Potential Emissions (ton/yr)
PM/PM10/PM2.5	0.15	g/bhp-hr	EPA Tier III	0.02
NOx	3	g/bhp-hr	EPA Tier III	0.31
CO	2.6	g/bhp-hr	EPA Tier III	0.27
Sox	0.000012	lb/bhp-hr	AP-42 Table 3.4-1 (10/96)	0.00057
VOC	1	g/bhp-hr	EPA Tier III	0.10
CO_2	1.080000	lb/bhp-hr	AP-42 Table 3.4-1 (10/96)	51.03
CH_4	0.000705	lb/bhp-hr	AP-42 Table 3.4-1 (10/96)	0.03
N_2O	0.000600	kg/MMBtu	40 CFR 98, Subpart C, Table C-2	0.00
CO_{2e}	-			51.99
HAPs	See table below			0.00

Hazardous Air Pollutants (HAPs)

Pollutant	CAS No.	Emission Factor	Units	Emission Factor Reference	Potential Engine Emissions (ton/yr)
Benzene	71-43-2	9.33E-04	lb/MMBtu	AP-42, Table 3.3-2	3.09E-04

Toluene	87-86-5	4.09E-04	lb/MMBtu	AP-42, Table 3.3-2	1.35E-04
Xylenes	1330-20-7	2.85E-04	lb/MMBtu	AP-42, Table 3.3-2	9.43E-05
Propylene	115-07-1	2.58E-03	lb/MMBtu	AP-42, Table 3.3-2	8.53E-04
1,3- Butadiene	106-99-0	3.91E-05	lb/MMBtu	AP-42, Table 3.3-2	1.29E-05
Formaldehyde	50-00-0	1.18E-03	lb/MMBtu	AP-42, Table 3.3-2	3.90E-04
Acetaldehyde	91-20-3	7.67E-04	lb/MMBtu	AP-42, Table 3.3-2	2.54E-04
Acrolein	107-02-8	9.25E-05	lb/MMBtu	AP-42, Table 3.3-2	3.06E-05
Polycyclic aromatic hydrocarbons (PAH)	110-54-3	1.68E-04	lb/MMBtu	AP-42, Table 3.3-2	5.56E-05
				Totals	**2.13E-03**

Dew Point Heater

Max. Fuel Combustion Rate =	1.11	MMBtu/hr
Fuel Usage =	9.16	MMscf/yr
Hours of Operation =	8,760	hr/yr
Fuel High Heating Value=	1,061	MMBtu/MMscf
Conversions:	453.59	grams/lb
	2000	lbs/ton

Criteria Pollutants (HAPs)

Pollutant	Emission Factor	Units	Emission Factor Reference	Emissions (lbs/hr)	Emissions (tons/yr)
PM	7.6	lb/MMscf	AP-42 Table 1.4-2 (07/98)	7.95E-03	0.03
NOx	100	lb/MMscf	AP-42 Table 1.4-1 (07/98)	1.05E-01	0.46
CO	84	lb/MMscf	AP-42 Table 1.4-1 (07/98)	8.79E-02	0.38
VOC	5.5	lb/MMscf	AP-42 Table 1.4-2 (07/98)	5.75E-03	0.03
SO_2	5.71	lb/MMscf	Calculated, 2 gr/100 scf	5.97E-03	0.03
CO_2	148774.0	lb/MMscf	AP-42 Table 1.4-2 (07/98)	1.56E+02	681.72
CH_4	0.001	kg/MMBtu	40 CFR 98, Subpart C, Table C-2	2.45E-03	0.01
N_2O	0.0001	kg/MMBtu	40 CFR 98, Subpart C, Table C-2	2.45E-04	0.00

Hours of Operation =	300	hr/yr
Max. Fuel Combustion Rate =	2.21	MMBtu/hr
Fuel Heating Value=	1000	MMBtu/MMscf
Avg BSFC =	7000	Btu/hp-hr

Pollutant	Emission Factor	Units	Emission Factor Reference	Potential Emissions (ton/yr)
PM/PM10/PM2.5	0.15	g/bhp-hr	EPA Tier III	0.02

NOx	3	g/bhp-hr	EPA Tier III	0.31
CO	2.6	g/bhp-hr	EPA Tier III	0.27
Sox	0.000012	lb/bhp-hr	AP-42 Table 3.4-1 (10/96)	0.00057
VOC	1	g/bhp-hr	EPA Tier III	0.10
CO_2	1.080000	lb/bhp-hr	AP-42 Table 3.4-1 (10/96)	51.03
CH_4	0.000705	lb/bhp-hr	AP-42 Table 3.4-1 (10/96)	0.03
N_2O	0.000600	kg/MMBtu	40 CFR 98, Subpart C, Table C-2	0.00

V. Existing Air Quality

The air quality classification for the immediate area is "Unclassifiable or Better Than National Standards" (40 CFR 81.327) for all pollutants, apart from sulfur dioxide (SO_2). The site location is within the Laurel SO_2 nonattainment area (NAA) for the 1971 primary SO_2 National Ambient Air Quality Standards (NAAQS). This NAA is a 2-kilometer (km) (1.2 miles, mi) radius circle centered on the geographic center of the CHS Laurel Refinery. The proposed facility does not constitute a significant increase in SO_2 due to the use of clean burning natural gas as the primary fuel for the RICE. The Department expects that a future redesignation effort will show compliance with the 1971 SO_2 standard.

VI. Ambient Air Impact Analysis

Bison Engineering (Bison) conducted air quality modeling for the proposed facility as part of NWE's Laurel Generating Station (LGS) air quality permit application. This ambient air impact analysis was conducted, pursuant to the requirements of ARM 17.8.749, to demonstrate that the proposed modification would not cause or contribute to a violation of any state or federal ambient air quality standard. The proposed project is not categorized as a major Prevention of Significant Deterioration (PSD) application.

The new LGS proposed emission PTEs are above the modeling thresholds listed in Montana's draft Modeling Guideline for PM_{10}, $PM_{2.5}$, NO_2, and CO, and warrant further analyses. Emission increases were first modeled to determine if any model receptors exceeded the Class II Significant Impact Levels (SILs), presented in Table VI-1. For those pollutant and averaging times that exceed the applicable SILs, NWE demonstrated compliance with NAAQS, MAAQS, and PSD Increments, also presented in Table VI-1. For this project, PM_{10} 24-hour, PM_{10} annual, $PM_{2.5}$ 24-hour, $PM_{2.5}$ annual, NO_2 1-hour and NO_2 annual Class II SILs were exceeded, which then warranted NAAQS, MAAQS and analyses for applicable pollutant/time periods. Additionally, compliance was shown for Class II Increment, and a Class I SIL analysis was performed to ensure that the project would not adversely affect the closest Class I area, the North Absaroka Wilderness Area.

Table VI-1 Applicable standards

Pollutant	Averaging Period	Class I SIL ($\mu g/m^3$)	Class II SIL ($\mu g/m^3$)	Primary NAAQS ($\mu g/m^3$)	MAAQS ($\mu g/m^3$)	Class I Increment ($\mu g/m^3$)	Class II Increment ($\mu g/m^3$)
PM_{10}	24-hour	0.3	5	150	150	8	30
	Annual	0.2	1	-	50	4	17
$PM_{2.5}$	24-hour	0.27	1.2	35	-	2	9
	Annual	0.051	0.2	12	-	1	4
NO_2	1-hour	-	7.5	188	564	-	-
	Annual	0.1	1	100	94	2.5	25
CO	1-hour	-	2,000	40,000	26,000	-	-
	8-hour	-	500	10,000	10,000	-	-
O_3	8-hour	-	1.96	137	-	-	-

The SIL, Increment, and MAAQS/NAAQS compliance demonstrations were conducted using the latest available version of EPA-approved American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) and associated preprocessors. Specifically:

- AERMOD version 19191: Air dispersion model.
- AERMET version 19191: processes NWS meteorological data for input to AERMOD.
- AERMINUTE version 15272: processes 1-minute NWS wind data to generate hourly average winds for input to AERMET.
- AERSURFACE version 20060: processes 1992 National Land Cover Data surface characteristics for input to AERMET.
- AERMAP version 18081: Processes National Elevation Data from the USGS to determine elevation of sources and receptors for input into AERMOD.
- BPIPPRM version 04274: characterizes building downwash for input to AERMOD.
- Oris Solution's BEEST Graphical User Interface, Version 12.05.

Regulatory default options were used for all model runs. Rural dispersion coefficients were applied, as all of Montana currently meets this criterion. All buildings at the site were evaluated for building downwash on each modeled point source, using BPIPPRM.

Five years of metrological data (2015-2019) ready for use in AERMOD was constructed using representative surface and upper air data. Surface air data was obtained from the closest National Weather Service (NWS) station, which is located approximately 14 miles to the northeast of the project site, at the Billings Logan International Airport (KBIL – WBAN 24033). This NWS station also provided the automated surface observing system (ASOS) one-minute data used with AERMINUTE. The Great Falls Upper Air station (KGTF – WBAN 24143) was used for upper air data. The ADJ_U* option was employed in AERMET to account for stable, low wind speeds.

A series of nested receptor grids were used in the model to calculate the ambient air impacts around the project location. Discrete receptors were placed at 25 m spacing along the site's ambient air boundary, 50 m spacing from the site's ambient air boundary to 500 m from the site, 100 m spacing from 500 m to 1 km from the site, 250 m spacing from 1 km to 3 km from the site, 500 m spacing from 3 km to 10 km, and 1000 m spacing from 10 km to 50 km, totaling 13,965 receptor locations. Significantly impacted receptors (receptors with modeled concentrations equal to or greater than their respective Class II SILs) were used for the NAAQS/MAAQS and applicable Increment analyses.

The source and building elevations at the site were based on the existing graded elevation. Receptor elevations and regional inventory source elevations were determined using the terrain preprocessor AERMAP and elevation data based on 1/3 arc-second (approximately 10 m resolution) National Elevation Dataset (NED) from the United States Geological Survey (USGS).

Background monitors were selected from Montana's Air Quality Monitoring Network Plan (May 2019), based on the closest and most representative sites with available data. The following applicable $PM_{2.5}$, PM_{10}, and NO_2 monitoring sites were identified for use for background concentrations. For PM_{10} (24-hour and annual) design values calculated from the monitor at Lewistown (30-027-0006) were used. For NO_2, design values were also calculated from the Lewistown site (30-027-0006). For $PM_{2.5}$ (24-hour and annual), data was stitched

together from two sites in Billings, the St. Lukes monitor (30-111-0085) from January 2016 through December 2017, and the Lockwood monitor (30-111-0087) from December 2017 through December 2018. When applicable, the background concentrations were calculated both including and excluding exceptional events to illustrate the impacts of wildfires on the background levels and are displayed in Table VI-2.

Table VI-2 Applicable Background concentrations

Pollutant	Averaging Time	Background Conc. (µg/m^3)[(1)]	Basis	Site	Background Conc. (µg/m^3)[(2)]
$PM_{2.5}$	24-hour	16.1	Maximum 24-hour avg.	Billings – St. Lukes (30-111-0085) and Lockwood (30-111-0087) (years: 2016-2018)	24.2
	Annual	6.5	3-year Annual avg.		7.5
PM_{10}	24-hour	32	Avg. of yearly 2nd max 24-hour value	Lewistown (30-027-0006) (years: 2016-2018)	65
	Annual	8.5	3-year Annual avg.		10
NO_2	1-hour	18.8 (10 ppb)	Avg 98% of daily 1-hour max	Lewistown (30-027-0006) (years: 2017-2019)	-
	Annual	1.1 (0.59 ppb)	3-year Annual avg.		-

[(1)]Data excludes all exceptional event data in the calculations.
[(2)]Data includes all exceptional event data in the calculations.

Data with exceptional events removed was used for all purposes in this analysis. The background concentrations are added to the modeled concentrations in the NAAQS/MAAQS analyses.

For the NO_2 modeling analyses, Tier 2 (Ambient Ratio Method, ARM2) was employed in AERMOD, with the EPA default minimum and maximum ambient ratios of 0.5 and 0.9, respectively (ratio of NO_2/NO_x).

Source parameters were provided by NWE; all were modeled as "point" sources in AERMOD and their descriptions are displayed in Table VI-3.

Table VI-3 Onsite Source Descriptions

Source ID	Source Description	Source Category	Source Type
RICE10_1	9.7 MW NG 100 (G)	New Source	POINT
RICE10_2	9.7 MW NG 100 (G)	New Source	POINT
RICE10_3	9.7 MW NG 100 (G)	New Source	POINT
RICE10_4	9.7 MW NG 100 (G)	New Source	POINT
RICE10_5	9.7 MW NG 100 (G)	New Source	POINT
RICE10_6	9.7 MW NG 100 (G)	New Source	POINT
RICE10_7	9.7 MW NG 100 (G)	New Source	POINT
RICE10_8	9.7 MW NG 100 (G)	New Source	POINT
RICE10_9	9.7 MW NG 100 (G)	New Source	POINT
RICE10_10	9.7 MW NG 100 (G)	New Source	POINT
RICE10_11	9.7 MW NG 100 (G)	New Source	POINT
RICE10_12	9.7 MW NG 100 (G)	New Source	POINT
RICE10_13	9.7 MW NG 100 (G)	New Source	POINT
RICE10_14	9.7 MW NG 100 (G)	New Source	POINT
RICE10_15	9.7 MW NG 100 (G)	New Source	POINT
RICE10_16	9.7 MW NG 100 (G)	New Source	POINT
RICE10_17	9.7 MW NG 100 (G)	New Source	POINT
RICE10_18	9.7 MW NG 100 (G)	New Source	POINT
DPHTR	Dew Point Heater	New Source	POINT
EDG	Emergency Diesel Generator	New Source	POINT
FIREPUMP	Fire Pump Generator	New Source	POINT

Class II SIL Air Quality Analysis

Modeling was performed to identify receptors at which the proposed facility creates a modeled impact higher than the respective SIL concentration for each pollutant and averaging period. For this analysis, all new source emissions were considered. Four load profile operating scenarios (100% Load Guaranteed, "100G"; 100% Load Annual Average, "100A"; 75% Load, "75"; and Minimum Environmental Compliance Load, "MECL") plus startup-shutdown (SUSD) emissions were modeled to capture the highest ambient impacts. SUSD were evaluated for NO_x and CO, whose emission rates were greater than steady-state emissions (8.38 lb/hr NO_x; 13.13 lb/hr CO). The new sources were modeled at their hourly peak potential emissions for short term averaging periods, and their annual emissions for the annual averaging periods, based on 8,760 hours per year per engine, 8,760 hours per year per heater, and 300 hours per year for emergency fire pump generator and diesel-fired generator. The steady-state emission rates which produced the highest impacts are displayed in Table VI-4 (scenario 100A for CO, and scenario 100G for other pollutants). The receptors which exceeded the SIL for each pollutant and averaging period were retained for further analyses. Additionally, SIL receptors that exceeded the SIL levels for all operating scenario runs (per pollutant) were retained for the respective full impact analyses, to ensure that the analysis covered all locations that could be cause for concern.

To address the ambient ozone impacts from the project, EPA's Modeled Emission Rates for Precursors (MERPs) tool was employed. The hypothetical source in Yellowstone County was chosen, with 500 tpy emissions of both NO_x and VOC precursors, and a 10 m stack height, as it has the closest resemblance to the applicant's source. The results for each precursor were scaled to the applicant's emission rates (222 tpy NOx and 215 tpy VOC). This results in a 0.68 ppb increase in ozone, which is less than the O_3 Class II SIL of 1 ppb (1.96 $\mu g/m^3$).

Table VI-4 SIL Modeled Emissions Increases

Source ID	PM_{10} 24-hour (lb/hr)	PM_{10} Annual (tpy)	$PM_{2.5}$ 24-hour (lb/hr)	$PM_{2.5}$ Annual (tpy)	NO_2 1-hour (lb/hr)	NO_2 Annual (tpy)	CO 1 & 8-hour (lb/hr)
RICE10_1	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_2	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_3	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_4	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_5	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_6	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_7	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_8	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_9	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_10	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_11	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_12	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_13	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_14	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_15	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_16	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_17	0.96	4.20	0.36	1.58	1.70	12.08	1.59
RICE10_18	0.96	4.20	0.36	1.58	1.70	12.08	1.59
DPHTR	0.01	0.03	0.01	0.03	0.11	0.46	0.09
EDG	0.89	0.13	0.89	0.13	NA	4.26	15.37
FIREPUMP	0.10	0.02	0.10	0.02	NA	0.31	1.81
Total:		**75.78**		**28.56**		**222.47**	

Modeled PM_{10}, $PM_{2.5}$, NO_2, and CO Class II SIL results are presented in Table VI-5. $PM_{2.5}$ impacts exceeded the 24-hour and Annual SILs, PM_{10} impacts exceed the 24-hour and Annual SILs, and NO_2 1-hour and Annual SILs were exceeded, therefore applicable NAAQS, MAAQS, and Class II Increment analyses were performed. For the pollutants and averaging periods exceeding the SIL, the radius of impact was determined, which was the furthest distance of the modeled SIL-exceeded receptor from the source.

Table VI-5 Class II Significant Impact Analysis Results

Pollutant	Avg. Period	Model Conc. ($\mu g/m^3$)	SIL ($\mu g/m^3$)	Exceed SIL?
PM_{10}	24-hour[1]	14.58	5.0	Yes
	Annual[2]	1.17	1.0	Yes
$PM_{2.5}$	24-hour[3]	8.2	1.2	Yes
	Annual[4]	0.414	0.2	Yes
NO_2	1-hour[5] (Steady-State)	41.97	7.5	Yes
	1-hour[5] (SUSD)	137.39	7.5	Yes
	Annual[2]	4.12	1.0	Yes
CO	1-hour[6] (Steady-State)	571.39	2,000	No
	1-hour[6] (SUSD)	571.27	2,000	No
	8-hour[7] (Steady-State)	209.56	500	No
	8-hour[7] (SUSD)	218.7	500	No

[1]The receptor with the maximum 24-hour concentration in the 5-year period.
[2]The receptor with the maximum annual concentration in the 5-year period.
[3]The receptor with the maximum 5-year average 24-hour concentration.
[4]The receptor with the maximum 5-year average annual concentration.
[5]The receptor with the maximum 5-year average of the maximum daily 1-hour concentration.
[6]The receptor with the maximum 1-hour concentration in the 5-year period.
[7]The receptor with the maximum 8-hour concentration in the 5-year period.

NAAQS/MAAQS Air Quality Analysis

For NAAQS and Increment analyses, all onsite sources were modeled at their peak emissions, which are displayed in Table VI-4. Offsite/competing source emissions were also included in these analyses. Nearby facilities were included based on their emissions and proximity to the SIL modeling radius of impact for each pollutant. The identified facilities are displayed in Table VI-6.

Table VI-6 Competing Source Facility List

Facility Name	Distance from LGS (km)
CHS INC REFINERY LAUREL	1.71
EXXONMOBIL BILLINGS REFINERY	29.73
GRAIN CRAFT	22.09
MONTANA SULPHUR & CHEMICAL	30.04
BILLINGS LANDFILL GAS PRODUCTION FACILITY	16.44

BILLINGS REFINERY – Phillips 66	24.07
WESTERN SUGAR COOPERATIVE	22.76
YELLOWSTONE POWER PLANT	29.85

For the NAAQS/MAAQS analyses, the nearby sources were modeled at PTE emissions, based on permit limits and/or emission inventory analyses in their respective Montana Air Quality Permits. These are detailed in the current permit application and supporting materials. All offsite facilities and annual emissions are shown in Table VI-7 below sources.

Table VI-7 Competing Sources Modeled Annual Emissions

Facility	PM_{10} Annual Emissions - NAAQS (tpy)	PM_{10} Emissions - Increment (tpy)	$PM_{2.5}$ Annual Emissions - NAAQS (tpy)	$PM_{2.5}$ Emissions - Increment (tpy)	NO_2 Annual Emissions - NAAQS (tpy)	NO_2 Emissions - Increment (tpy)
CHS	219.56	196.00	219.56	184.15	857.14	440.29
Exxon	147.61	147.61	147.61	147.61	501.51	501.51
Grain Craft	1.99	1.99	1.99	1.99	NA	NA
MDU	23.52	23.52	23.52	23.52	146.55	146.55
Montana Sulphur	39.07	39.07	39.07	39.07	11.69	11.69
P66	111.95	111.95	111.95	111.95	572.11	572.11
Western Sugar	13.67	13.67	13.67	13.67	253.78	253.78
YELP	2.54	2.54	2.54	2.54	361.53	361.53

Sources descriptions, and AERMOD source types are shown in Table VI-8 below.

Table VI-8 Offsite Source Descriptions

Source ID	Source Description	Source Type
CHS_F1	Coker Drum Steam Vent	VOLUME
CHS_F2	Coke Handling	VOLUME
CHS_F3	Coke Storage Pile	VOLUME
CHS_F4 – CHS_F30	Coke Haul Road Paved Segment 1 – 27	VOLUME
CHS_F31 – CHS_F58	Coke Haul Road Unpaved Segment 1 – 28	VOLUME
CHS_F59 – CHS_F81	Asphalt Haul Road Segment 1 – 23	VOLUME
CHS_F82 – CHS_F113	Gasoline Haul Road Segment 1 – 32	VOLUME
CHS_F114 – CHS_F149	Propane Haul Road Segment 1 – 36	VOLUME
CHS_P1	CHS - #3 Hydrogen Plant Reformer	POINT
CHS_P2	CHS - FCC Process	POINT
CHS_P3	CHS - H-102 Reformer Heater	POINT

CHS_P4	CHS - Main Crude Heater (RFG)	POINT
CHS_P5	CHS - Crude Preheater (Petrochem)	POINT
CHS_P6	CHS - No. 1 Vacuum Heater	POINT
CHS_P7	CHS - NHT Charge Heater	POINT
CHS_P8	CHS - No. 1 Naphtha Unifiner Stripper Reboiler	POINT
CHS_P9	CHS - NHT Splitter Reboiler	POINT
CHS_P10	CHS - NHT No. 2 Stripper Reboiler	POINT
CHS_P11	CHS - Platformer Heater Four Sections	POINT
CHS_P12	CHS - Platformer Debutanizer Heater	POINT
CHS_P13	CHS - Platformer Splitter Reboiler	POINT
CHS_P14	CHS - New FCC Feed Preheater	POINT
CHS_P15	CHS - H-201 Charge Heater	POINT
CHS_P16	CHS - H-202 Charge Heater	POINT
CHS_P17	CHS - ULSD Heater H-901	POINT
CHS_P18	CHS - ULSD Heater H-902	POINT
CHS_P19	CHS - Alky Oil Heater	POINT
CHS_P20	CHS - Coker Charge Heater	POINT
CHS_P21	CHS - Zone A SRU-TGTU-TGI	POINT
CHS_P22	CHS - Zone D	POINT
CHS_P23	CHS - Coker Unit SRU through TGI	POINT
CHS_P24	CHS - Railcar Light Product Loading VCU	POINT
CHS_P25	CHS - H2 Plant H-1001 Heater	POINT
CHS_P26	CHS - Coker Unit Flare	POINT
CHS_P27	CHS - No. 11 Boiler	POINT
CHS_P28	CHS - Truck Light Product Loading VCU	POINT
CHS_P29	CHS - Coker Unit Cooling Tower - Cell #1	POINT
CHS_P30	CHS - Coker Unit Cooling Tower - Cell #2	POINT
CHS_P31	CHS - No. 12 Boiler	POINT
CHS_P32	CHS - #1 Asphalt/RO Loading Heater	POINT
CHS_P33	CHS - No. 2 Crude Heater (new location)	POINT
CHS_P34	CHS - No. 10 Boiler	POINT
CHS_P35	CHS - New Flare	POINT
CHS_P36	CHS - NH3 Incinerator	POINT
CHS_P37	CHS - H-101 Reformer Heater	POINT
CHS_P38	CHS - Cooling Tower #1 - Cell #1	POINT
CHS_P39	CHS - Cooling Tower #1 - Cell #2	POINT
CHS_P40	CHS - Cooling Tower #1 - Cell #3	POINT
CHS_P41	CHS - Cooling Tower #1 - Cell #4	POINT
CHS_P42	CHS - Cooling Tower #2 - Cell #1	POINT
CHS_P43	CHS - Cooling Tower #2 - Cell #2	POINT
CHS_P44	CHS - Cooling Tower #2 - Cell #3	POINT
CHS_P45	CHS - Cooling Tower #3 - Cell #1	POINT
CHS_P46	CHS - Cooling Tower #3 - Cell #2	POINT

CHS_P47	CHS - Cooling Tower #5 - Cell #1	POINT
CHS_P48	CHS - Cooling Tower #5 - Cell #2	POINT
CHS_P49	CHS - No. 2 CU Vacuum Heater	POINT
CHS_P50	CHS - Coker Charge Heater #2	POINT
CHS_P51	CHS - New Boiler (Boiler No. 13)	POINT
GC1	GRAIN CRAFT - 111-0006 - WHITE FLOUR MILLING	POINT
GC2	GRAIN CRAFT - 111-0006 - WHEAT TRANSFER/CONVEY	POINT
GC3	GRAIN CRAFT - 111-0006 - WHEAT CLEANING #1	POINT
GC4	GRAIN CRAFT - 111-0006 - WHEAT CLEANING #2	POINT
GC5	GRAIN CRAFT - 111-0006 - FLOUR BAGGING/SHIPPING	POINT
GC6	GRAIN CRAFT - 111-0006 - WHOLE WHEAT MILLING	POINT
WS1	WESTERN SUGAR COOPERATIVE - BOILER #1 - NATRL GAS	POINT
WS2	WESTERN SUGAR COOPERATIVE - BOILERS #2, 3, AND 4 - RILEY COAL	POINT
WS3	WESTERN SUGAR COOPERATIVE - EAST PULP DRYER	POINT
WS4	WESTERN SUGAR COOPERATIVE - WEST PULP DRYER	POINT
WS5	WESTERN SUGAR COOPERATIVE - PELLETIZER-COOLER	POINT
WS6	WESTERN SUGAR COOPERATIVE - COAL UNLOAD/HANDLE FUGTVS	POINT
WS7	WESTERN SUGAR COOPERATIVE - LIMESTONE UNLOAD/HNDL FUG	POINT
WS8	WESTERN SUGAR COOPERATIVE - EXPOSED AREA - WIND EROS	POINT
WS9	WESTERN SUGAR COOPERATIVE - BEET UNLOAD/HANDLE FUGTVS	POINT
WS10	WESTERN SUGAR COOPERATIVE - LIMESTONE CONVEY	POINT
P66_1	P66 - Alky Heater (H-21)	POINT
P66_2	P66 - Boiler House (B-1, B-2, B-5, & B-6) Stack	POINT
P66_3	P66 - Backup Coke Crusher Diesel Engine	POINT
P66_4	P66 - Boiler House Backup Air Compressor Engine	POINT
P66_5	P66 - Coker Backup Air Compressor Engine	POINT
P66_6	P66 - Flare Drum Backup Pump Engine	POINT
P66_7	P66 - No. 2 HDS Heater (H-10)	POINT
P66_8	P66 - No. 2 HDS Debutanizer Reboiler (H-11)	POINT
P66_9	P66 - No. 2 HDS Main Fractionator Reboiler (H-12)	POINT
P66_10	P66 - Catalytic Reforming Unit #2 (H-13)	POINT
P66_11	P66 - Catalytic Reforming Unit #2 (H-14)	POINT
P66_12	P66 - Sat Gas Stabilizer Reboiler (H-16)	POINT
P66_13	P66 - Butamer Heater (H-20)	POINT

P66_14	P66 - Catalytic Reforming Unit #2 (H-23)	POINT
P66_15	P66 - Coker Furnace (H-3901)	POINT
P66_16	P66 - Cooling Tower - Combination Unit	POINT
P66_17	P66 - Cooling Tower - Condensate Unit	POINT
P66_18	P66 - P400 E Diesel Firewater Pump at Ponds	POINT
P66_19	P66 - P491 Cooling Tower Water to Fire Water	POINT
P66_20	P66 - P4701 W Diesel Firewater Pump at Ponds	POINT
P66_21	P66 - Boilerhouse Emergency Diesel Generator	POINT
P66_22	P66 - MCC7 Emergency Diesel Generator	POINT
P66_23	P66 - P510 Storm Water Sump to Holding Pond	POINT
P66_24	P66 - Blender Research Octane Knock Engine	POINT
P66_25	P66 - Blender Motor Octane Knock Engine	POINT
P66_26	P66 - Main Lab Research Octane Knock Engine	POINT
P66_27	P66 - Main Lab Motor Octane Knock Engine	POINT
P66_28	P66 - Small Crude Unit Heater (H-1)	POINT
P66_29	P66 - FCCU Preheater (H-18)	POINT
P66_30	P66 - Large Crude Unit Heater (H-24)	POINT
P66_31	P66 - FCCU Stack	POINT
P66_32	P66 - No. 4 HDS Recycle Hydrogen Heater (H-8401)	POINT
P66_33	P66 - No. 4 HDS Fractionator Feed Heater (H-8402)	POINT
P66_34	P66 - No. 1 H2 Plant Reformer Heater (H-9401)	POINT
P66_35	P66 - Coke Handling	POINT
P66_36	P66 - No. 5 HDS Charge Heater (H-9501)	POINT
P66_37	P66 - No. 5 HDS Stabilizer Reboiler Heater (H-9502)	POINT
P66_38	P66 - No. 2 H2 Plant Reformer Heater (H-9701)	POINT
P66_39	P66 - Delayed Coking Unit - Vent and Coke Cutting	POINT
P66_40	P66 - Cooling Tower (CWT-5)	POINT
P66_41	P66 - Jupiter Cooling Tower (CT-615A/B/C)	POINT
P66_42	P66 - Jupiter Cooling Tower (CT-120)	POINT
P66_43	P66 - Vacuum Furnace (H-17) - NEW	POINT
P66_44	P66 - Jupiter Main Stack No. 1 - Average	POINT
P66_45	P66 - Jupiter Cooling Tower (CT-602)	POINT
YELP1	Yellowstone Power Plant	POINT
MSCC1	Montana Sulphur	POINT
EXX1	Exxon (worst case stk)	POINT
MDU_BL1	Billings Landfill Flare	POINT
MDU_BL2	Billings Landfill 349 bhp Engine 1	POINT
MDU_BL3	Billings Landfill 349 bhp Engine 2	POINT

The NO_2 1-hr analysis was performed for both steady-state (worst case operating scenario) and startup-shutdown conditions, to ensure that NWE does not cause or contribute to a violation of the NO_2 1-hour NAAQS. The emissions for the NAAQS/MAAQS analyses are discussed previously and displayed in Table VI-4.

The results of the NAAQS analyses are shown in Table VI-9, which show that the modeled emissions comply with $PM_{2.5}$, PM_{10}, and NO_2 NAAQS standards.

Table VI-9 NAAQS Analysis Results

Pollutant	Avg. Period	Model Design Value (µg/m³)	Monitor Design Value (µg/m³)	Total Conc. (µg/m³)	Primary NAAQS (µg/m³)	% of NAAQS
PM_{10}	24-hour[(1)]	12.5	32	44.5	150	30%
$PM_{2.5}$	24-hour[(2)]	5.6	16.1	21.7	35	62%
	Annual[(3)]	0.72	6.5	7.2	12	60%
NO_2	1-hour[(4)] (Steady-State)	124.1	18.8	142.9	188	76%
	1-hour[(4)] (SUSD)	124.2	18.8	143.0	188	76%
	Annual[(3)]	4.6	1.1	5.7	100	6%

[(1)]The receptor with the 6th-highest 24-hr concentration over 5 years.

[(2)]The receptor with the 8th-highest 24-hr concentration per year, averaged over 5 years.

[(3)]The receptor with the maximum annual concentration averaged over 5 years.

[(4)]The receptor with the 8th-highest daily 1-hr max concentration averaged over 5 years.

A demonstration of compliance with applicable MAAQS (ARM 17.8 Subchapter 2), displayed in Table V1-1, was performed for the 1-hour and Annual NO_2 standard, due to the modeled exceedance of the NO_2 SILs. Compliance with the PM_{10} 24-hour MAAQS was demonstrated above, because the form of the standard is the same as the NAAQS. Since the form of the NO_2 1-hour MAAQS is not to be exceeded more than once per year, it was assessed as the highest-second-high from the 1-hour daily max concentrations to demonstrate that the project will not cause or contribute to an exceedance of the 1-hour NO_2 MAAQS. The results of the NO_2 Annual analysis above was also compared to the NO_2 Annual MAAQS. The results are displayed in Table VI-10. NWE provided a qualitative argument to demonstrate compliance with the PM MAAQS.

Table VI-10 MAAQS Analysis Results

Pollutant	Avg. Period	Model Design Value (µg/m³)	Monitor Design Value (µg/m³)		Total Conc. (µg/m³)	Primary MAAQS (µg/m³)	% of MAAQS
PM_{10}	Annual[(1)]	1.5	8.5		10.0	50	20%
NO_2	1-hour[(2)] (Steady-State)	126.5	18.8		145.3	564	26%
	1-hour[(2)] (SUSD)	133.6	18.8		152.4	564	27%
	Annual[(1)]	4.6	1.1		5.7	94	6%

[(1)]The receptor with the maximum annual concentration averaged over 5 years.

[2]The receptor with the second highest daily maximum 1-hour concentration averaged over 5 years.

Class II Increment Air Quality Analysis

The proposed Laurel Generating Station is not a PSD-major facility, but after discussion with the Department, NWE provided a Class II PSD Increment evaluation, due to the minor-source baseline dates being triggered in the area for PM_{10}, $PM_{2.5}$, and NO_2. The analysis was performed for those pollutants and averaging periods exceeding the Class II SIL. The same offsite sources were evaluated from the NAAQS/MAAQS analysis. In this analysis, the reported two-year average emissions (2019-2020) were used for CHS sources and PTE emissions were used at all other facilities. All source emissions were assumed to consume increment compared to each pollutant's baseline period. The results are displayed in Table VI-11.

Table VI-11 Class II Increment Analysis Results

Pollutant	Avg. Period	Model Conc. ($\mu g/m^3$)	Class II PSD Increment ($\mu g/m^3$)	% of Increment
PM_{10}	24-hour[1]	9.49	30	32%
$PM_{2.5}$	24-hour[1]	3.89	9	43%
	Annual[2]	0.709	4	18%
NO_2	Annual[2]	3.62	25	15%

[1]The receptor with the maximum second highest 24-hour concentration in the 5-year period.
[2]The receptor with the maximum annual concentration in the 5-year period.

Class I Air Quality Analysis

The closest federally mandated Class I Area is the North Absaroka Wilderness area, which is 113 km southwest. NWE evaluated impacts on Class I Areas utilizing a Q/d analysis, which is generally requested by federal land managers when a Class I Area is greater than 50 km from the project site. The emissions (Q) is the sum of SO_2 (14.14 tpy), NO_x (222.4 tpy), PM_{10} (75.6 tpy), and H_2SO_4 (0 tpy), and the distance (d, in kilometers) is the distance from the project site to the Class I Area. The Q/d results are displayed in Table VI-12 for the three nearest Class I Areas. Q/d less than 10 is generally where federal land managers consider the impacts at the Class I Area as negligible.

Table VI-12 Class I Q/d Analysis Results

Class I Area	Distance (km)	Q/d
North Absaroka Wilderness Area	113	2.77
Yellowstone National Park	121	2.59
Northern Cheyenne Indian Reservation	135	2.31

The Department determined that the project related PM_{10}, $PM_{2.5}$, NO_2, and CO emissions (with offsite facility emissions) will not cause or contribute to a violation of a federal or state ambient air quality standard. This decision was based on the air dispersion modeling with qualitative/quantitative analyses. The full modeling analysis submitted with the MAQP application is on file with the Department.

The Department determined the proposed ambient air impact analysis submitted with the application demonstrates compliance with the MAAQS and NAAQS and that the impacts from this permitting action will be minor. The Department believes it will not cause or contribute to a violation of any ambient air quality standard.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted the following private property taking and damaging assessment.

YES	NO	
X		1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	X	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	X	3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property)
	X	4. Does the action deprive the owner of all economically viable uses of the property?
	X	5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If no, go to (6)].
		5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		5b. Is the government requirement roughly proportional to the impact of the proposed use of the property?
	X	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)
	X	7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally?
	X	7a. Is the impact of government action direct, peculiar, and significant?
	X	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	X	7c. Has government action lowered property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?
	X	Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

Based on this analysis, the Department determined there are no taking or damaging implications associated with this permit action.

VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

Analysis Prepared By: Craig Henrikson
Date: August 23, 2021

MEIC-0144
DEQ001155

September 8, 2021

NorthWestern Energy
Laurel Generating Station
11 East Broadway Street
Butte, Montana 59701

Dear Ms. Sullivan:

Montana Air Quality Permit #5261-00 is deemed final as of September 8, 2021, by the Department of Environmental Quality (Department). As this is an Energy Development Project, the appeal period ends on September 22, 2021. All conditions of the Department's Decision remain the same. Enclosed is a copy of your permit with the final date indicated.
Conditions: See attached.

For the Department,

Julie A. Merkel
Permitting Services Section Supervisor
Air Quality Bureau
(406) 444-3626

Craig Henrikson, P.E.
Environmental Engineer
Air Quality Bureau
(406) 444-6711

Enclosures

Armstrong, Catherine

From: Thompson, William W <WILLIAM.THOMPSON@northwestern.com>
Sent: Friday, August 13, 2021 5:18 PM
To: Jones, Craig
Cc: Sullivan, Mary Gail; Henrikson, Craig; Williams, James L Jr
Subject: RE: [EXTERNAL] Supplemental MEPA information for LGS EA

We are contemplating adding an access to the generating station from the north from our substation property so we'll need to talk to SHPO and do some research on what we'd need to do to make that happen.

Sent from Workspace ONE Boxer [whatisworkspaceone.com]

On August 13, 2021 at 5:09:05 PM MDT, Jones, Craig <crajones@mt.gov> wrote:

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Bill,
The Canyon Creek Ditch is a cultural site, probably due to the 50 years old criteria. You would know better than me, but I don't think NWE is crossing the ditch or canal into the site. Correct?

From: Thompson, William W <WILLIAM.THOMPSON@northwestern.com>
Sent: Friday, August 13, 2021 5:03 PM
To: Jones, Craig <crajones@mt.gov>
Cc: Sullivan, Mary Gail <MaryGail.Sullivan@northwestern.com>; Henrikson, Craig <CHenrikson@mt.gov>; Williams, James L Jr <JamesL.Williams@northwestern.com>
Subject: RE: [EXTERNAL] Supplemental MEPA information for LGS EA

Craig. Is the Canyon Creek Ditch a cultural resource of some type? I didn't call SHPO to confirm but thought it was. If not, then SHPO wouldn't be involved and a crossing would be part of the detailed design which will occur later and we'd obtain all necessary permits and approvals for the design.

Sent from Workspace ONE Boxer [whatisworkspaceone.com]
On August 13, 2021 at 2:38:48 PM MDT, Jones, Craig <crajones@mt.gov> wrote:

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Bill,

Thank you to you and to your team for putting this information together for us. I appreciate you turning this around so quickly. Thank you! Craig

---

From: Thompson, William W <WILLIAM.THOMPSON@northwestern.com>
Sent: Friday, August 13, 2021 2:17 PM
To: Jones, Craig <crajones@mt.gov>
Cc: Sullivan, Mary Gail <MaryGail.Sullivan@northwestern.com>; Henrikson, Craig <CHenrikson@mt.gov>; Williams, James L Jr <JamesL.Williams@northwestern.com>
Subject: FW: [EXTERNAL] Supplemental MEPA information for LGS EA

Good Afternoon Craig,
We've provided answers in red to your questions below. Please let us know if you need anything else.

Bill

William W. Thompson, P.E.
Senior Technical Advisor
11 East Park Street | Butte, MT 59701-1711
Office: (406) 497-3912 | Cell: (406) 490-1498
Email: william.thompson@northwestern.com

In the end, it's not the years in your life that count, it's the life in your years.

Below is the requested supplemental MEPA information for the proposed Laurel Generating Station EA. I appreciate your help in getting this information for DEQ's Environmental Assessment (EA). Please let me know if any of the requested information is unclear or needs further clarification. Thank you for your help.

1. What is the estimated duration of construction of the Proposed Action? Construction activities will take place from approximately April 2022 through May 2023; Startup and commissioning would run from approximately June 2023 through December 2023 .
2. Please estimate in months the entire length of the construction schedule for the Proposed Action. See answer to #1. Would the construction be 24 hours per day/ 7 days a week or another schedule proposed? Currently the construction schedule contemplates working M-F and possibly some Saturdays, normal working hours.
3. What is the operational life of the Proposed Action?

The specifications for the project specify a minimum design life of 30 years. Operation beyond 30 years is common for this type of power generation facility.

4. What type of construction equipment would be on-site to build the Proposed Action? Typical equipment for large construction projects. Cranes, backhoes, graders/dozers, passenger trucks, delivery trucks, cement trucks, various other types of smaller equipment.
5. What are the types of soil on the site? See attached Geotechnical Evaluation Report
6. Are there any specially designated soil types on the site? See attached Geotechnical Evaluation Report

7. What type of geology is on the site? See attached Geotechnical Evaluation Report
8. Are there any wetlands on the site? No Would any wetlands be disturbed by the Proposed Action? No
9. What agricultural crop is currently on the site? None
10. What kind of mitigations would NWE deploy in crossing the Canyon Creek Ditch? The project is still in the detailed design phase and this information is not currently available. NorthWestern will work with SHPO to determine these requirements and comply with all SHPO requirements.
11. What is the distance to any residences of the Proposed Action? There are two residences near the property: one to the east and one to the southeast. These can be seen on Figure GA351 attached to the permit application. Measuring from the center of the east side of the engine hall these residences are approximately 1,030 feet and 1,230 feet away from the engine hall. The exhaust stacks are on the west side of the engine hall and are further away from the residences.
12. Did NWE complete a noise study of the Proposed Action? If so, could you please provide it?

Preliminary Engineering analyses was performed to establish noise level limits for the Project. The Contractor will demonstrate that all installed equipment complies with the established noise criteria for the far-field noise emissions, namely:

- Less than or equal to 65 dBA at 450 feet (East)
- Less than or equal to 65 dBA at 600 feet (West)
- "East" reference shall be a line located 105 feet to the east of and parallel to the Engine Hall east-most exterior wall; "West" reference shall be the radiators west-most face. These limits are within NorthWestern's property boundary.
- Noise emissions to the north and south of the Engine Hall shall also fall within the 65 dBA at 600 feet limit.

To meet this criteria, noise mitigation measures for the Project will include:

- From the RICE Equipment supplier
  - Combustion air inlet 45 dB silencer
  - Exhaust gas 45 dB silencer
  - Low noise radiators
- From the Installation contractor
  - Building noise attenuation panels, including treatment for HVAC systems

13. Did NWE complete any visual simulations, if so, could you please provide this simulation. Please see attached figure. We will eventually have a 3-D model but that won't be until after detailed design begins next year.
14. What is the current zoning of the proposed site? See email from Roy Ishkanian
15. Would the current zoning need to be modified and to what zoning category? See email from Roy Ishkanian
16. What other permits would the Proposed Action need to obtain for construction and operations of the facility? See #17. In addition to the MAQP, a title V operating permit will be required following construction and startup.
17. Has NWE submitted any other permit applications for this Proposed Action? If yes, please list them. No other permit applications have been submitted at this time but construction will require a building permit, a stormwater discharge permit associated with construction activity, and possibly a public right of way permit and oversize/overweight MDOT permit.
18. What is the estimated disturbance during construction and operation of the following items? We estimate 70% of the 36 acre property, or 25 acres, will be disturbed or used in some manner during construction. Figure GA351 attached to the permit application indicates the permanent structures and equipment and also the parking and laydown areas (the lined lots east of the main plant area) anticipated to be used during construction. The "in operation" disturbances are anticipated to look similar to the numbered plant structures and equipment in Figure GA

351. The final design may vary slightly. If you need a copy of GA 351, Craig Henrikson could forward you the permit application or I can send it to you.

a. eighteen (18) 9.7-megawatt-electrical (MWe) reciprocating internal combustion engines (RICE)
b. one 2,682 –brakehorsepower (bhp) emergency diesel-fired generator
c. one 315-bhp diesel fire pump engine
d. 1.11 MMBtu/hr natural gas line heater
e. New access road

From: Sullivan, Mary Gail <MaryGail.Sullivan@northwestern.com>
Sent: Wednesday, August 11, 2021 6:19 PM
To: Thompson, William W <WILLIAM.THOMPSON@northwestern.com>
Cc: Craig Jones <crajones@mt.gov>; Ishkanian, Roy <Roy.Ishkanian@northwestern.com>
Subject: Fwd: [EXTERNAL] Supplemental MEPA information for LGS EA

Bill, per our discussion, would you please provide Craig whatever information we might have that would help answer the questions below. Roy can also support re the Zoning questions so I've also copied him.

Thank you,

MG

---------- Forwarded message ----------
From: Jones, Craig <crajones@mt.gov>
Date: August 11, 2021 at 6:04:41 PM MDT
Subject: [EXTERNAL] Supplemental MEPA information for LGS EA
To: Sullivan, Mary Gail <MaryGail.Sullivan@northwestern.com>
Cc: Henrikson, Craig <CHenrikson@mt.gov>

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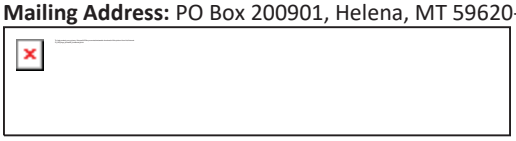
Mary Gail,

Below is the requested supplemental MEPA information for the proposed Laurel Generating Station EA. I appreciate your help in getting this information for DEQ's Environmental Assessment (EA). Please let me know if any of the requested information is unclear or needs further clarification. Thank you for your help.

1. What is the estimated duration of construction of the Proposed Action?

2. Please estimate in months the entire length of the construction schedule for the Proposed Action. Would the construction be 24 hours per day/ 7 days a week or another schedule proposed?
3. What is the operational life of the Proposed Action?
4. What type of construction equipment would be on-site to build the Proposed Action?
5. What are the types of soil on the site?
6. Are there any specially designated soil types on the site?
7. What type of geology is on the site?
8. Are there any wetlands on the site? Would any wetlands be disturbed by the Proposed Action?
9. What agricultural crop is currently on the site?
10. What kind of mitigations would NWE deploy in crossing the Canyon Creek Ditch?
11. What is the distance to any residences of the Proposed Action?
12. Did NWE complete a noise study of the Proposed Action? If so, could you please provide it?
13. Did NWE complete any visual simulations, if so, could you please provide this simulation.
14. What is the current zoning of the proposed site?
15. Would the current zoning need to be modified and to what zoning category?
16. What other permits would the Proposed Action need to obtain for construction and operations of the facility?
17. Has NWE submitted any other permit applications for this Proposed Action? If yes, please list them.
18. What is the estimated disturbance during construction and operation of the following items?
    a. eighteen (18) 9.7-megawatt-electrical (MWe) reciprocating internal combustion engines (RICE)
    b. one 2,682 –brakehorsepower (bhp) emergency diesel-fired generator
    c. one 315-bhp diesel fire pump engine
    d. 1.11 MMBtu/hr natural gas line heater
    e. New access road

Craig Jones
MEPA/MFSA Coordinator
Office 406-444-0514 **Cell Phone:** 406-465-1168
Mailing Address: PO Box 200901, Helena, MT 59620-0901



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Air Quality Bureau • P.O. Box 200901 • Helena MT 59620-0901 • (406) 444-3490

AIR QUALITY PERMIT APPLICATION FOR STATIONARY SOURCES

Montana Department of Environmental Quality
Air Quality Bureau
Permitting Services Section Supervisor
1520 E. Sixth Avenue
P.O. Box 200901
Helena, MT 59620-0901
Phone: (406) 444-3490 FAX (406) 444-1499
Email: DEQ-ARMB-Admin@mt.gov

For State of Montana Use Only
Permit Application #: 5261 AFS #: 111-0051
Application Fee Paid with Application? ☐ Yes ☐ No
Amount Paid: _____ Check #: _____

Three complete copies of this application, any associated fees, and the affidavit of publication of the attached public notice must be delivered to the address above. The application may be submitted electronically to the email address provided above; however, the application will not be considered complete until the appropriate permit application fee, affidavit of publication, and certification of truth, accuracy, and completeness are submitted to the Department. Any checks, affidavits, and certifications submitted separately from the application should be clearly identified. The applicant is encouraged to contact the Department with any questions related to this application form.

*Note: This application form should **not** be used for portable sources or oil and gas registrations. Permit application forms for portable sources and oil and gas registrations are available on the Department's website. Applications for Acid Rain permits must be made on nationally standardized forms available from the U.S. Environmental Protection Agency as well as through the Department's application for a Title V Operating Permit.*

§1.0 General Facility Information and Site Description

§1.1 FACILITY NAME AND ADDRESS (As registered with the Montana Secretary of State)

Company Name **NorthWestern Energy**

Facility Name **Laurel Generating Station**

Mailing Address	Physical Address (if different from mailing address)
11 East Park Street Address	**Parcel 2, East of Sewer Plant Road** Address
Butte **MT** **59701** City State Zip	**Laurel** **MT** **59044** City State Zip

NorthWestern Energy
Laurel Generating Station

Annual Potential to Emit Analysis (PTE)

Proposed Emissions

	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	SO_2 (tpy)	CO (tpy)	VOC (tpy)	CO_2 (tpy)	CO_2e (MT/year)	CH_4 (tpy)	N_2O (tpy)	HAPs (tpy)
Engines	75.46	75.46	28.30	217.33	14.11	243.39	214.81	768,915	769,706	14.43	1.44	93.81
Emergency Generato	0.13	0.13	0.13	4.26	0.00	2.31	0.28	467	431	0.28	0.00	0.01
Firepump Engine	0.02	0.02	0.02	0.31	0.00	0.27	0.10	51	47	0.03	0.00	0.00
Dew Point Heater	0.03	0.03	0.03	0.46	0.03	0.38	0.03	682	621	0.01	0.00	0.01
Fugitive Road Dust	0.27	0.08	0.01	-	-	-	-	-	-	-	-	-
Totals	75.91	75.72	28.49	222.36	14.14	246.36	215.23	770,115	770,805	14.75	1.45	93.83

SERs	*25*	*15*	*10*	*40*	*40*	*100*	*40*
Modeling?	*Yes* [b]	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*

Global Warming Potentials
(from 40 CFR 98, Subpart A, Table A-1)

CO_2 = 1
CH_4 = 25
N_2O = 298

Conversions

1 metric ton = 1.1023 ton

[a] VOC emissions include formaldehyde
[b] No ambient standard exists for PM, however modeling was performed for both PM_{10} and $PM_{2.5}$

Annual emissions

Pollutant	Max mass emissions rate (lb/hr)	Max PTE - SUSD emissions (tpy)	Max SUSD emissions (tpy)	Max PTE w/SUSD Case (tpy)	18 engines (tpy)	Max PTE, one engine (tonnes/yr)[4,5]	18 engines (tonnes/yr)[4,5]	
Total PM (Filterable + Condensible)	0.96	4.09	0.10	4.19	75.5	---	---	**Max Case**
Total PM10 (Filterable + Condensible)	0.96	4.09	0.10	4.19	75.5	---	---	
Total PM2.5 (Filterable + Condensible)	0.36	1.53	0.04	1.57	28.3			
NOx as NO2	1.70	7.24	4.84	12.1	217.3	---	---	
SO_2	0.17	0.72	0.06	0.8	14.1	---	---	
CO	1.59	6.77	6.75	13.5	243.4	---	---	
VOC	2.00	8.52	0.68	9.2	165.4	---	---	
Formaldehyde	0.44	1.87	0.87	2.7	49.4	---	---	
CO2	9752.9	42,718	-[6]	42,718	768,915	---	---	
CH4	0.18	0.8	-[6]	1	14	---	---	
N2O	0.018	0.08	-[6]	0	1	---	---	
$CO2e$[5]	---	---	---	42,761	769,706	38,793	698,265	
Total PM10 (Filterable + Condensible)	0.96	4.09	0.10	4.2	75.5	---	---	**100 G**
Total PM2.5 (Filterable + Condensible)	0.36	1.53	0.10	1.6	29.5			
NOx as NO2	1.70	7.24	4.84	12.1	217.3	---	---	
SO_2	0.170	0.72	0.06	0.8	14.1	---	---	
CO	1.50	6.39	6.75	13.1	236.5	---	---	
Total PM10 (Filterable + Condensible)	0.96	4.09	0.10	4.2	75.5	---	---	**100 AA**
Total PM2.5 (Filterable + Condensible)	0.36	1.53	0.10	1.6	29.5			
NOx as NO2	1.70	7.24	4.84	12.1	217.3	---	---	
SO_2	0.169	0.72	0.06	0.8	14.0	---	---	
CO	1.59	6.77	6.75	13.5	243.4	---	---	
Total PM10 (Filterable + Condensible)	0.72	3.07	0.10	3.2	57.1	---	---	**75**
Total PM2.5 (Filterable + Condensible)	0.27	1.15	0.10	1.3	22.6			
NOx as NO2	1.29	5.49	4.84	10.3	185.9	---	---	
SO_2	0.169	0.72	0.06	0.8	14.0	---	---	
CO	1.51	6.43	6.75	13.2	237.3	---	---	
Total PM10 (Filterable + Condensible)	0.25	1.06	0.10	1.2	21.0	---	---	**MECL**
Total PM2.5 (Filterable + Condensible)	0.090	0.38	0.10	0.5	8.8			
NOx as NO2	0.50	2.13	4.84	7.0	125.4	---	---	
SO_2	0.169	0.72	0.06	0.8	14.0	---	---	
CO	0.58	2.47	6.75	9.2	166.0	---	---	

Model Input Emission Rates

SIL

Source	Fuel Type	PM10 (lb/hr)	PM10 (tpy)	PM25 (lb/hr)	PM25Ann (tpy)	NO2 (lb/hr)	NO2Ann (tpy)	CO (lb/hr)
Max Case	NG	**0.96**	**4.19**	**0.36**	**1.57**	**8.38**	**12.07**	**13.13**
100 G	NG	**0.96**	**4.19**	**0.36**	**1.64**	1.70	**12.07**	1.50
100 A	NG	0.96	---	0.36	---	1.70	---	1.59
75	NG	0.72	---	0.27	---	1.29	---	1.51
MECL	NG	0.25	---	0.09	---	0.50	---	0.58
SU/SD	NG	0.56	---	0.21	---	**8.38**	---	**13.13**
		100G		*100G*		*100G*		*100A*

Notes and references:

1) Vendor provided

2) The lb/hr model values are based on the maximum startup and shutdown times with the maximum startup/shutdown emissions value

3) Vendor did not provide SU/SD estimates for these pollutants. Scaled according to the worst-case startup and shutdown times based on fuel consumption

4) Sum of CO_{2e} presented in tonnes/yr to demonstrate applicability of 40 CFR 98

5) Carbon dioxide equivalent (CO_{2e}) is calculated by multiplying individual global waming emissions by the associated global warming potential factor.

6) The SU/SD emissions for the GHG pollutants are included in the Max PTE (with the mass rates being calculated at 8760 hours per year).

Inside:
Pumpkin contest

The Laurel Outlook

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Volume 113, Number 18 • Thursday, October 28, 2021

Laurel Soccer girls play for State Championship Saturday

The Home of...
Rhonda Burghardt, Choral Director of the Year! Congratulations!

Saturday, Oct. 30

- **Winter in the Rockies Fall/Christmas Bazaar**, 8 a.m.-3:30 p.m., food and lots of vendors, St. Anthony's Parish Hall, 715 4th Ave.
- **Annual Good Shepherd Holiday Bazaar**, 9 a.m.-3 p.m. Lunch served 11 a.m.-1 p.m., at Lutheran Church of the Good Shepherd, 1108 24th St. W., Billings. local crafters and great food!
- **First Congregational Church,** 506 S. 5th St., **Fall Harvest Celebration**, 6 p.m., food, games, prizes and fun for all.

Sunday, Oct. 31

- **Laurel Chamber of Commerce Halloween Carnival**, Laurel Middle School 2-4 p.m., 628-8105
- **Trunk or Treat**, safe family fun, 6-8 p.m., at **The Rock Church**, 820 W. 9th St., 406-628-6200
- **Trunk or Treat at New Life Foursquare Church** 5 to 8 p.m., 201 1st Ave.

Community Calendar...

See Page 6 for more calendar events and Page 7 for the Fans in the Stands LHS events schedule

Book Sale!

The Laurel Public Library is having its book sale through Saturday, Nov. 6, 2021 - a two week sale. Proceeds benefit the Laurel Public Library Foundation. Hours are Monday-Thursday 9 a.m.-7 p.m. Friday 9 a.m.-5 p.m., Saturday 9 a.m.-3 p.m. Closed Sunday. 720 West 3rd Street, 406-628-4961. See ad on page 6.

Coffee and Donuts

The Laurel Senior Center will start a "Coffee & Donuts" activity every Thursday morning, starting with the first Thursday in November. The Center will be open at 9 a.m., for anyone who wants to meet with friends, make new friends and enjoy fellowship. Refreshments will be available for purchase.

LHS Honor Society Halloween food drive

On Halloween, the Laurel High School National Honor Society will be trick–or–treating for canned goods from 4 p.m. to 9 p.m. on October 31 as part of their food drive. The students will spread out across Laurel in teams to collect food to be donated to Community Hope the following week.

Vote!

It isn't too late to cast your ballots for City of Laurel and county elections. Folks may register and vote through Monday, Nov. 1 at noon at the Yellowstone County Courthouse. Ballots may be returned through 8 p.m. Tuesday, Nov. 2.

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Groups challenge state's approval of NorthWestern's Laurel Gas Plant

City to vote on pipeline easement tonight

By KATHLEEN GILLULY
Outlook editor

Last week, the Montana Environmental Information Center and Sierra Club challenged the Montana Department of Environmental Quality's approval of NorthWestern Energy's proposed 175-megawatt methane gas plant in Laurel on the banks of the Yellowstone River. Earthjustice, representing both organizations, filed the complaint in Yellowstone County.

The groups have challenged DEQ's environmental assessment of the gas plant. Specifically, they pointed out DEQ's failure to analyze the threat posed by drilling under the Yellowstone River to place a pipeline to supply the plant. Just 10 years ago, ExxonMobil's Silvertip pipeline carrying crude oil under the river near Laurel broke. The subsequent clean-up of the estimated leak of 1,500 barrels of oil continued for several years with the costs ongoing.

At the Tuesday, Oct. 12, Laurel City Council meeting, councilors tabled a resolution to allow the pipeline to be constructed, although they have scheduled a special meeting tonight just to vote on the matter. The vote could allow NorthWestern Energy an easement to construct, operate and maintain the pipeline through Riverside Park and under the river. With the exception of dog walking and use of the boat ramp, the park has been closed since the July 2011 breach. Using funding from the settlement with Exxon for the spill, the city has rebuilt the campground and had planned to open it this year.

MEIC and the Sierra Clubs are also challenging DEQ's failure to fully consider the impacts the plant could have on air quality, noise and the climate crisis. According to the conservation groups, methane gas poses a unique and significant threat to the climate.

Laurel area doesn't meet federal pollution standards now

Among other pollutants the plant could release each year, the plant would emit sulfur dioxide, a pollutant known to cause negative health impacts. The Laurel area currently does not meet federal health-based standards for sulfur dioxide levels in the air. In addition to the pollution concerns, the plant could also harm residents with damaging levels of noise from 18 internal combustion engines, as well as industrial lighting, and views of nearly 80-foot-tall stacks along river, according to the lawsuit.

Along with the CHS refinery and the railyard, the construction of the gas plant would certainly cement Laurel's image as industrial, and could impact housing prices and other quality-of-life issues, according to one analysis.

"NorthWestern Energy is an industry laggard in embracing clean energy," said Earthjustice attorney Amanda Galvan, who is representing the groups. "DEQ's failure to analyze the negative impacts associated with this proposed gas plant misses a key opportunity to inform responsible choices about our energy future and a transition toward clean, affordable, and reliable renewable energy resources."

In a press release sent by Anne Hedges, Director of Policy and Legislative Affairs with the Montana Environmental Information Center, she is quoted as saying, "As if volatile natural gas prices don't pose enough of a threat to average Montanans, now DEQ is ignoring the law just to help NorthWestern rely even more heavily on this volatile resource."

She added, "Our drought-stricken state had to pay over $54 million dollars fighting climate-fueled wildfires this year. These fires harmed public health and our economy. Despite this, DEQ refused to consider the fact that methane gas from plants such as this one are what are making the climate crisis and our wildfire season even worse."

Earthjustice is representing MEIC and Sierra Club in the lawsuit. Earlier this year, the groups opposed the plant before the Montana Public Service Commission. In NorthWestern's pre-approval application, the company had sought guaranteed cost recovery of the approximately $286 million the company plans to spend on the gas plant. NWE has estimated that cost will add about $80 yearly to the average Montanans electricity bill.

"There's a long list of reasons Northwestern should not build a gas-fired power plant on the banks of the Yellowstone River — including the skyrocketing cost of gas — but the Montana DEQ only had to focus on the environmental risks, and they completely failed," said David Merrill, Sierra Club Senior Organizing Representative. "It's simply unacceptable that DEQ gave Northwestern approval to build this gas-fired plant without accounting for the risks of pipeline leaks, sulfur dioxide pollution, and other threats to the safety of our air, water, and climate."

A rendering showing the new Laurel Golf Club clubhouse was completed by A & E Design. The existing clubhouse, which opened in 1967, will be replaced by a new larger facility with a completion date of 2023.

Bigger, better clubhouse coming to Laurel Golf Club

Photos and story by JACI WEBB
Of The Laurel Outlook Staff

For more than five decades the Laurel Golf Club has been one of Laurel's shining stars, providing lush greens, serving great food, and helping golfers hone their skills.

None of that is going to change, but it's only getting bigger and better. The Laurel Golf Club members got onboard with the idea of reconstructing the club house, almost doubling its size and making upgrades in the process. Construction will begin in January with a completion date in 2023. In the meantime, the 18-hole golf course will be open and the restaurant will be set up as a food truck with a large heated tent for patrons. Bingo nights will continue as long as the public supports them.

The Laurel Golf Club is only open to members for golf, but the restaurant is open to all, and over the years, the Club Restaurant has gained a reputation for hosting elegant New Year's Eve and Valentine's Day dinners, and serving good food all year long.

A quote on the golf course website perfectly defines this well-respected course: "Our members don't come to Laurel Golf Club to play tennis or take a swim – they come to sharpen their skills, they come to be challenged, they come to golf."

Clubhouse manager Jennifer Nelson said while she watched some businesses struggle during the pandemic, the Laurel Golf Club got through the challenges because of its dedicated staff and strong membership.

Nelson complimented the staff for coming together to make things run smoothly during COVID, and she is confident they will make this transition smooth as well.

"We are successful because we have a great team at the Laurel Golf Club from the grounds to the dining room and kitchen to the pro shop," Nelson said.

A & E Design and Langlas & Associates, both of Billings, are working together on the reconstruction. The original 18-hole course and 8,000 square-foot clubhouse were designed and built in the 1960s, with the course designed by Theodore Wirth of Billings. The Laurel Golf Club opened in 1967. Since that time, only one renovation to the clubhouse has been completed, and that was necessary because of a fire.

Building Committee Chair Drake Webinger said building a new clubhouse is overdue.

"It's a 50-year-old facility," he pointed out. "It's going to be nice to have an update. It's going to be a comfortable facility, not over the top. It's going to be done right," Webinger said.

Clubhouse manager Jennifer Nelson has worked at the Laurel Golf Club since she was in high school.

Many of the Laurel Golf Club employees have been there for decades. Nelson has been working at the Laurel Golf Club for 20 years, since she was in high school. Nelson finished her degree from Montana State University Billings and worked her way up to the top spot at the club. Course superintendent Bob Popp has worked at the Laurel Golf Club for 33 years.

Golf, Page 10

Residents south of river protest NWE gas plant at council meeting

By KATHLEEN GILLULY
Outlook editor

At Tuesday evening's Laurel City Council meeting, several residents living off of Thiel Road on the south side of the Yellowstone River signified their disapproval of NorthWestern Energy's proposed methane-powered electricity generating plant during the public comment period.

Kasey Felder, who lives with her family on McMullen Lane directly across from the site NWE plans to build the plant, said she didn't think consideration had been given to the lives, health and property values of residents in her neighborhood.

"I would urge you to consider the residents who live due south of the planned project," she said, before thanking the council for their consideration and asking when the matter would be brought up again.

Other residents in Felder's neighborhood wrote letters objecting to the plant on similar grounds. The letters were read into the record by Laurel City Clerk Bethany Langve.

Terry Larson who lives on Lance Lane wrote in protest of the annexation of the land for the plant by the city. "I'm writing to ask you don't rezone the 36-acre parcel where NorthWestern Energy has proposed to build the 175-megawatt gas plant," his short letter began.

Steve Krumm of 24th Avenue West in Laurel also wrote in opposition to the proposed rezoning. He noted that only NWE officials were invited to present before the City-County Planning Board when the matter came before them. "This is the wrong location to build this plant for multiple reasons," he wrote. He noted that because NWE is bypassing the permitting process there hasn't been the opportunity for the public to weigh in on the plant's construction. NWE has cited rising construction costs as the impetus for proceeding without going through the process. "Laurel City Council protect your residents and county residents by voting 'no' on the zoning change," Krumm wrote.

Travis Lance who resides on Lance Lane also wrote in opposition to the proposed plant, saying NWE was disingenuous when they stated the plant would not be in a residential area, because it is very close to his. He said he is the third generation to live on Lance Lane. He is raising his 8-year-old son there and has spent a considerable amount of money making improvements to the property and was concerned about property values, among other issues.

During the Mayor's Update period, Council President Emelie Eaton said she had also received several emails concerning the plant and would ensure they were put on record.

Eaton stated that residents would be able to express their concerns regarding the proposed power plant at a meeting Nov. 23 when the zoning change would be on the agenda.

She also said there would be a special one-item council meeting today, Oct. 28. The one item is the formerly tabled resolution allowing NWE's easement through Riverside Park to allow a pipeline to be installed for the proposed plant.

Councilors Irv Wilke, Don Nelson and Bruce McGee were absent.