UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT TRIAL AND APPEAL BOARD

Berkshire Hathaway Energy Company,
Interstate Power & Light Company,
MidAmerican Energy Company,
PacifiCorp,
WEC Energy Group, Inc., and
Wisconsin Power & Light Company

Petitioners

v.

Birchtech Corp.

Patent Owner

IPR2025-00281
Patent No. 10,596,517

PETITIONERS' AUTHORIZED REPLY TO PATENT OWNER'S PRELIMINARY RESPONSE

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PETITIONERS' EXHIBIT LIST

Exhibit	Description of Exhibits
1001	U.S. Patent No. 10,596,517 to Olson et al. (filed June 4, 2018) **("'517 Patent" or "Challenged Patent")**
1002	Declaration of Dr. Stephen Niksa in Support of Petition for *Inter Partes* Review of U.S. Patent No. 10,596,517 **("'517 Niksa Decl.")**
1003	Curriculum Vitae of Dr. Stephen Niksa
1004	Family Tree of ME2C Patents
1005	U.S. Patent Publication No. 2004/0013589 to Vosteen et al. (filed July 24, 2002) **("Vosteen589")**
1006	U.S. Patent Pub. No. 2008/0107579 to Downs et al. (published May 8, 2008) **("Downs-Boiler")**
1007	U.S. Patent Prov. App. No. 60/555,353 (filed Mar. 22, 2004) **("Downs-Boiler-Provisional")**
1008	Travis Starns, "Full-Scale Test of Mercury Control with Sorbent Injection and an ESP at Wisconsin Electric's Pleasant Prairie Power Plant," Session AE1-C, Paper No. 43249, AIR & WASTE MANAGEMENT'S ASSOCIATION'S 95TH ANNUAL CONFERENCE (Baltimore, MD: June 23-27, 2002) **("Starns")**

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1009	Massachusetts Dep. of Environmental Protection, Bureau of Waste Prevention, "Evaluation of the Technological and Economic Feasibility of Controlling and Eliminating Mercury Emissions from the Combustion of Solid Fossil Fuel" (Dec. 2002) **("Mass-EPA")**, available at: https://web.archive.org/web/20030411074158/http:/www.state.ma.us/dep/bwp/daqc/files/mercfeas.pdf and at https://www.mass.gov/doc/evaluation-of-technological-economic-feasibility-of-controlling-eliminating-mercury-emissions/download
1010	Sharon Sjostrom, "Full Scale Evaluations of Mercury Control Technologies with PRB Coals," Track A, Session A3 (Mercury – Control), Presentation A3b, EUEC: 8TH ELECTRIC UTILITIES ENVIRONMENTAL CONFERENCE (Tucson, Arizona: January 25, 2005) **("Sjostrom")**
1011	Craig Eckberg et al., "Mercury Control Evaluation of Halogen Injection into a Texas Lignite-Fired Boiler," Track A, Session A3 (Mercury – Control), Presentation A3c, EUEC: 8TH ELECTRIC UTILITIES ENVIRONMENTAL CONFERENCE (Tucson, Arizona: January 25, 2005) **("Eckberg")**
1012	U.S. Patent Pub. No. 2006/0048646 to Olson et al. (published Mar. 9, 2006) **("Olson-646")**
1013	U.S. Patent No. 6,953,494 to Nelson (filed May 6, 2003) **("Nelson")**
1014	U.S. Patent No. 7,514,052 to Lissianski et al. (filed Apr. 7, 2009) **("Lissianski")**

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1015	RESERVED
1016	RESERVED
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1018	U.S. Patent No. 8,652,235 to Olson et al. (issued February 18, 2014) **("Olson-235")**
1019	RESERVED
1020	File History of U.S. Patent Prov. App. No. 60/605640 **("Provisional")**
1021	File History of U.S. Patent Application No. 11/209,163, which ultimately issued as U.S. Patent No. 7,435,286 **("'163 Application File History")**
1022	File History of U.S. Patent Application No. 12/201,595, which ultimately published as 2009/0062119 and was abandoned **("'595 Application File History")**
1023	Excerpts of File History of U.S. Patent Application No. 15/951,970, which ultimately issued as U.S. Patent No. 10,933,370 **("'370 Patent File History")**.
1024	File History of U.S. Patent Application No. 15/997,091, which ultimately issued as U.S. Patent No. 10,596,517 **("'517 Patent File History")**.

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1025	File History of U.S. Patent Application No. 12/419,219, which ultimately issued as U.S. Patent No. 8,168,147 **("'147 Patent File History").**
1026	File History of U.S. Patent Application No. 15/978,760 (issued as U.S. Patent No. 10,343,114) **("'114 Patent File History")**
1027	Babcock & Wilcox, STEAM: ITS GENERATION AND USE, 40th ed. (The Babcock & Wilcox Company: 1992) **("B&W: Steam")**
1028	J. Bustard, S. Sjostrom, et al., "Full Scale Evaluation of Sorbent Injection for Mercury Control on Coal-Fired Power Plants," International Conference on Air Quality III, Paper No. A5-4 (Sept. 9-12, 2002: Arlington, VA) **("Bustard")**
1029	U.S. Patent No. 1,984,164 to Stock et al. (issued Dec. 11, 1934) **("Stock")**
1030	Electric Utilities Environment Conference 2005 Handout **("EUEC Handout")**
1031	Scan of jacket/cover of CD mailed to conference attendees from EUEC: 8th Electric Utilities Environmental Conference (Tucson, Arizona: January 23-26, 2005) **("EUEC CD Scan")**
1032	Redline comparison between U.S. Patent Pub. No. 2008/0107579 (Downs-Boiler, EX1006) and U.S. Patent Prov. Appl. No. 60/555,353 (Downs-Boiler-Provisional, EX1007), using Downs-Boiler-Provisional as the original version **("Downs-Boiler-Redline")**

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1033	U.S. Patent No. 8,512,655
1034	U.S. Patent No. 8,821,819
1035	U.S. Patent No. 9,757,689
1036	CRC Handbook of Chemistry and Physics, 86th Ed.; Lide, D.R., ed. **("CRC Press: March 2005")**
1037	Paul Chu, "Power Plant Evaluation of the Effect of SCR Technology on Mercury," Paper No. 106, COMBINED POWER PLANT AIR POLLUTANT CONTROL MEGA SYMPOSIUM (MEGA) (Washington, DC: May 19-22, 2003) **("Power Plant Evaluation")**
1038	Evan J. Granite et al., "Sorbents for Mercury Removal from Flue Gas," DOE/FETC/TR–98-01, U.S. Department of Energy (Jan. 1998) **("Granite")**
1039	Thomas J. Feeley, et al., "A Review of DOE/NETL's Mercury Control Technology R&D Program for Coal-Fired Power Plants," *DOE/NETL Hg R&D Program Review* (April 2003) **("Feeley")**
1040	Oxtoby et al., PRINCIPLES OF MODERN CHEMISTRY, 4th ed (Saunders College Publishing: 1999) **("Oxtoby")**
1041	N.N. Greenwood and A. Earnshaw, CHEMISTRY OF THE ELEMENTS, 2nd ed. (Butterworth-Heinemann: 1997) **("Greenwood")**

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1043	Frank E. Huggins et al., "XAFS Examination of Mercury Sorption on Three Activated Carbons," *Energy & Fuels* 1999(13), p. 114-121 (1999) **("XAFS")**
1044	S. Niksa et al., *Predicting Complete Hg Speciation Along Coal-Fired Utility Exhaust Systems*, MEGA SYMPOSIUM, Paper # 45 (Washington, DC: Aug. 2004) **("Hg Speciation")**
1045	D.L. Laudal et al., *Evaluation of Mercury Speciation at Power Plants Using SCR and SNCR NOx Control Technologies*, Paper No. A5-01, INT'L CONF. ON AIR QUALITY III (Arlington, VA: Sept. 9-12, 2002) **("Laudal")**
1046	U.S. Patent No. 4,196,173 to DeJong **("DeJong")**
1047	U.S. Patent No. 5,695,726 to Lerner **("Lerner")**
1048	Carey, T. R., Jr., O. W. H., Richardson, C. F., Chang, R., & Meserole, F. B. (1998). Factors Affecting Mercury Control in Utility Flue Gas Using Activated Carbon. *Journal of the Air & Waste Management Association*, 48(12), 1166–1174. https://doi.org/10.1080/10473289.1998.10463753 **("Carey")**
1049	NETL - Mercury Emissions Control , February, 2003, available at: https://web.archive.org/web/20030315093905fw_/http://www.netl.do

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1050	Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 69 Fed. Reg. 4652-4752 [Volume 69, No. 20] (Jan. 30, 2004) **("EPA-Proposal")**
1051	U.S. EPA, "Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generation Units -- Final Report to Congress," (Vol. 1 1998), available at https://www3.epa.gov/ttn/utox/eurtc1.pdf (**"U.S. EPA – Vol. 1 1998"**)
1052	U.S. EPA, "Mercury Study Report to Congress Volume 1: Executive Summary," EPA-452/R-97-003 (Dec. 1997), available at https://www.epa.gov/sites/production/files/2015-09/documents/volume1.pdf (**"U.S. EPA – Exec. Summary Vol. 1 Dec. 1997"**)
1053	U.S. EPA, AP-42: External Combustion Sources, Chapter 1: Fifth Edition, Volume I (Sep. 1998), available at https://www3.epa.gov/ttn/chief/ap42/ch01/index.html (last visited Nov. 20, 2024) **("Chapter 1 of AP-42")**
1054	U.S. DOE, Mercury Emissions Control - Regulatory Drivers (Jan. 24, 2003), available at https://web.archive.org/web/20030416142937/http:/www.netl.doe.gov/coalpower/environment/mercury/regs.html **("Mercury Emissions Control")**

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1055	Clean Air Mercury Rule: Basic Information, available at https://web.archive.org/web/20050920005951/http:/www.epa.gov/mercuryrule/basic.htm **("Clean Air Mercury Rule")**
1056	EPA Newsroom, "EPA Announces First-Ever Rule to Reduce Mercury Emissions from Power Plants" (Mar. 15, 2005), available at: https://archive.epa.gov/epapages/newsroom_archive/newsreleases/91ab7266e65751b985256fc50067d9b0.html **("3/15/2005 EPA Press Release")**
1057	EPA Newsroom, "Public Comment Period Begins for Proposed Power Plant Regulations" (Jan. 29, 2004), available at: https://archive.epa.gov/epapages/newsroom_archive/newsreleases/4daf1d46e8dd755c85257036005511f9.html **("1/29/2004 EPA Press Release")**
1058	EPA Newsroom, "EPA Supplements Proposal to Reduce Power Plant Mercury Emissions," (Feb. 24, 2004), available at: https://archive.epa.gov/epapages/newsroom_archive/newsreleases/5810096dabfc9eba85256e440078905f.html **("2/24/2004 EPA Press Release")**
1059	Sharon Sjostrom et al., "Field Studies of Mercury Control Using Injected Sorbents," AWMA ANNUAL MEETING, Session Ae-1b (2002) **("Field Studies of Mercury Control")**
1060	EPA, "Mercury Study Report to Congress Volume VIII: An Evaluation of Mercury Control Technologies and Costs," EPA Report No. EPA-452/R-97-010 (Dec. 1997), available at https://www3.epa.gov/airtoxics/112nmerc/volume8.pdf **("EPA 1997 Mercury Study Report Vol. VIII")**

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1061	EUEC 2005 home page, available at: https://web.archive.org/web/20050303090129/http:/www.euec.com/
1062	Charlene R. Crocker et al., "Mercury Control with the Advanced Hybrid Particulate Collector Technical Progress Report," U.S. DOE-NETL (Nov. 2003) **("Crocker")**
1063	Redline Comparison, showing changes from '163 Application (as published at 2006/0048646) to '970 Application (as published at 2018/0229182)
1064	Redline Comparison, showing changes from '558 Application (as published at 2015/0246315) to '970 Application (as published at 2018/0229182)
1065	U.S. Patent No. 8,168,147
1066	U.S. Patent No. 10,933,370
1067	U.S. Patent No. 10,589,225
1068	File History of U.S. Patent Application No. 14/712,558, which ultimately issued as U.S. Patent No. 10,589,225 **("'225 Patent File History")**
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1070	Roop Chand Bansal, et al., ACTIVE CARBON (Marcel Dekker:1988). **("Bansal")**

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1071	*Midwest Energy Emissions Corp., et al. v. Arthur J. Gallagher & Co., et al.*, No. 1:19-cv-01334-CJB, Dkt. No. 440 (D. Del. June 24, 2022). **("Dkt No. 440")**
1072	*Midwest Energy Emissions Corp., et al. v. Arthur J. Gallagher & Co., et al.*, No. 1:19-cv-01334-CJB, Dkt. No. 447 (D. Del. July 12, 2022). **("Dkt No. 447")**
1073	Welcome Page of CD mailed to conference attendees of the 2002 Air & Waste Management's Association's 95th Annual Conference & Exhibition (Baltimore, Maryland: June 23-27, 2002) **("AWMA CD Scan")**
1074	Main Menu of CD mailed to conference attendees of the 2002 Air & Waste Management's Association's 95th Annual Conference & Exhibition (Baltimore, Maryland: June 23-27, 2002) **("AWMA CD Scan, Main Menu")**
1075	Author Index of CD mailed to conference attendees of the 2002 Air & Waste Management's Association's 95th Annual Conference & Exhibition (Baltimore, Maryland: June 23-27, 2002) **("AWMA CD Scan, Author Index")**
1076	Papers by Session of CD mailed to conference attendees of the 2002 Air & Waste Management's Association's 95th Annual Conference & Exhibition (Baltimore, Maryland: June 23-27, 2002) **("AWMA CD Scan, Papers by Session")**
1077	Scan of jacket/cover of CD mailed to conference attendees of the 2002 Air & Waste Management's Association's 95th Annual

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	Conference & Exhibition (Baltimore, Maryland: June 23-27, 2002) **("AWMA CD Photo")**
1078	AWMA Website (Internet Archive), available at https://web.archive.org/web/20020613041559/http://www.awma.org/about/overview.htm (AWMA Overview)
1079	AWMA Website (Internet Archive), available at https://web.archive.org/web/20020527005933/http://www.awma.org/ (AWMA Homepage, advertising AWMA 2002 Conference)
1080	AWMA Website (Internet Archive), available at https://web.archive.org/web/20020604012426/http://www.awma.org:80/about/ (AWMA About Page)
1081	AWMA Website (Internet Archive), available at https://web.archive.org/web/20020601173851/http://www.awma.org/ACE2002/tech-program/MondayPM.asp#AE-1c (AWMA Technical Program Schedule for Monday 24, 2002 for Session AE-1C)
1082	AWMA Website (Internet Archive), available at https://web.archive.org/web/20020616091740/http://www.awma.org/ACE2002/exhibition/list.asp (AWMA 2002 Conference list of exhibitors)
1083	AWMA Website (Internet Archive), available at https://web.archive.org/web/20020601121532/http://www.awma.org/ACE2002/top10list.asp (AWMA 2002 Conference Top Ten Reasons)
1084	AWMA Website (Internet Archive), available at https://web.archive.org/web/20020610093515/http://www.awma.org/

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	ACE2002/welcome.asp (AWMA 95th Annual Conference and Exhibition Welcome Page)
1085	AWMA Website (Internet Archive), available at https://web.archive.org/web/20020806044928/http://www.awma.org:80/pubs/bookstore/ItemInfo.asp?OrderCode_s=VIP-110-CD (AWMA Bookstore Page, Order form for 2002 AWMA Conference CD)
1086	AWMA Website (Internet Archive), available at https://web.archive.org/web/20020806041256/http://www.awma.org:80/pubs/bookstore/ (AWMA Bookstore Homepage)
1087	State of Massachusetts Mass-EPA (Internet Archive) (dated Jan. 6, 2003), available at https://web.archive.org/web/20030106044457/http://www.state.ma.us/dep/bwp/about.htm (describing mission of Mass Department of Environmental Protection, Bureau of Waste Prevention)
1088	State of Massachusetts Mass-EPA (Internet Archive) (dated Dec. 21, 2002), available at https://web.archive.org/web/20021221040816/http://www.state.ma.us/dep/bwp/bwpprogs.htm (describing the divisions and programs of the Mass Bureau of Waste Prevention)
1089	State of Massachusetts Mass-EPA (Internet Archive) (dated Jan. 6, 2003), available at https://web.archive.org/web/20030106024342/http://www.state.ma.us/dep/bwp/bwppubs.htm (describing the publications by program of the Mass Bureau of Waste Prevention)
1090	State of Massachusetts Mass-EPA (Internet Archive) (dated Dec. 20, 2002), available at

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	https://web.archive.org/web/20021220143210/http://www.state.ma.us/dep/bwp/daqc/daqcpubs.htm#ecp (describing the Air Program Planning Unit Publications of the Mass Bureau of Waste Prevention)
1091	Internet Archive Standard Affidavit, explaining how to interpret hyperlinks, available at: https://archive.org/legal/affidavit.php
1092	Expert Report of Philip J. O'Keefe, PE Regarding Infringement (Oct. 25, 2022) (excerpted), submitted by Patent Owner in *Midwest Energy Emissions Corp., et al. v. Arthur J. Gallagher & Co., et al.*, No. 1:19-cv-01334-CJB
1093	Deposition Transcript of Phillip O'Keefe Vol. 1 (Mar. 2, 2023), taken in *Midwest Energy Emissions Corp., et al. v. Arthur J. Gallagher & Co., et al.*, No. 1:19-cv-01334-CJB.
1094	Deposition Transcript of Phillip O'Keefe Vol. 2 (Mar. 3, 2023), taken in *Midwest Energy Emissions Corp., et al. v. Arthur J. Gallagher & Co., et al.*, No. 1:19-cv-01334-CJB.
1095	Deposition Transcript of Edwin Olson (Aug. 26, 2022) (excerpted), taken in *Midwest Energy Emissions Corp., et al. v. Arthur J. Gallagher & Co., et al.*, No. 1:19-cv-01334-CJB.
1096	Deposition Transcript of Michael Holmes (Aug. 24, 2022) (excerpted), taken in *Midwest Energy Emissions Corp., et al. v. Arthur J. Gallagher & Co., et al.*, No. 1:19-cv-01334-CJB.

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1097	Deposition Transcript of John Pavlish (Aug. 25, 2022) (excerpted), taken in *Midwest Energy Emissions Corp., et al. v. Arthur J. Gallagher & Co., et al.*, No. 1:19-cv-01334-CJB.
1098	Affidavit of Tanya Zeif, Custodian of Records for Internet Archive (1/10/2025), sponsoring Exhibits 1078-1086
1099	Affidavit of Tanya Zeif, Custodian of Records for Internet Archive (1/13/2025), sponsoring Exhibits 1009, 1061, 1087-1090
1100	RESERVED
1101	RESERVED
1102	RESERVED
1103	RESERVED
1104	RESERVED
1105	RESERVED
1106	RESERVED
1107	RESERVED
1108	RESERVED

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1109	RESERVED
1110	Petitioner PacifiCorp's Stipulation Regarding District Court Proceedings
1111	Petitioner MEC's Stipulation Regarding District Court Proceedings
1112	Petitioners WPL and IPL's Stipulation Regarding District Court Proceedings
1113	Puget Sound Energy, *Colstrip Facts*, available at: https://www.colstripfacts.com/faqs#:~:text=Talen%20Energy%20owns%2030%25%20interest,operator%20of%20all%20four%20plants.&text=PacifiCorp%20owns%20a%2010%25%20interest%20in%20units%203%20%26%204
1114	Plaintiff's Initial Infringement Contentions (March 18, 2025) served in *In re: Midwest Energy Emissions Corp. Patent Litig.*, No. 4:24-md-03132-SHL-WPK (S.D. Iowa) and filed publicly at ECF 106-3
1115	Exhibit A to Plaintiff's Initial Infringement Contentions (March 18, 2025) served in *In re: Midwest Energy Emissions Corp. Patent Litig.*, No. 4:24-md-03132-SHL-WPK (S.D. Iowa) and filed publicly at ECF 106-3
1116	*Coal Explained: Use of Coal*, U.S. Energy Information Administration (last updated Sept. 14, 2023), available at: https://www.eia.gov/energyexplained/coal/use-of-coal.php#:~:text=In%202022%2C%20coal20coal%20accounted%20for,19.5%25%20of%20U.S

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1117	*What EPA is Doing to Reduce Mercury Pollution, and Exposures to Mercury*, U.S. Env't Protection Agency (last updated July 11, 2024), available at https://www.epa.gov/mercury/what-epa-doing-reduce-mercurypollution-and-exposures-mercury
1118	Birchtech, *Technology Overview*, available at https://www.birchtech.com/tech-overview
1119	Exec. Order No. 14261, 90 Fed. Reg. 15517 (April 8, 2025)
1120	Patent Owner's Response to Petitioners' Motion to Stay Pending *Inter Partes* Review *In re: Midwest Energy Emissions Corp. Patent Litig.*, No. 4:24-md-03132-SHL-WPK, ECF 128 (S.D. Iowa)
1121	Docket Navigator, *Time to Trial in the Southern District of Iowa*, https://search.docketnavigator.com/patent/binder/0/0 (last accessed June 2, 2025)
1122	*Deere & Co. et. al v. Kinze Mfg., Inc. et. al*, 4:20-CV-00389 (S.D. Iowa) (Docket Sheet)
1123	*Piatz v. State Farm Mut. Auto. Ins. Co.*, 3:21-CV-00007 (S.D. Iowa) (Judge Locher) (Docket Sheet and ECF 8)
1124	*Probasco et al v. MFA Inc.*, 4:22-CV-00117 (S.D. Iowa) (Judge Locher) (Docket Sheet and ECF 7, 9)
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1126	*Nuhn Industries Ltd v. Bazooka Farmstar LLC*, 3:22-cv-00015 (S.D. Iowa) (Docket Sheet and ECF 286)
1127	*G.W. Lisk Company, Inc. v. Gits Manufacturing Company*, 4:17-cv-00273 (S.D. Iowa) (Docket Sheet)
1128	*In re: Midwest Energy Emissions Corp. Patent Litig.*, No. 4:24-md-03132-SHL-WPK, ECF 131 (S.D. Iowa May 22, 2025) (Order Denying Without Prejudice Pre-Institution Stay)
1129	*In re: Midwest Energy Emissions Corp. Patent Litig.*, No. 4:24-md-03132-SHL-WPK, ECF 111 (S.D. Iowa Apr. 18, 2025) (Order re: Petitioners' Deadline to File Surreply)
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1131	*In re: Midwest Energy Emissions Corp. Patent Litig.*, No. 4:24-md-03132-SHL-WPK, ECF 1 (S.D. Iowa December 17, 2024) (MDL Transfer Order)
1132	*In re: Midwest Energy Emissions Corp. Patent Litig.*, No. 4:24-md-03132-SHL-WPK, ECF 129 (S.D. Iowa May 21, 2025) (Petitioners' Reply Brief In Support of Motion to Stay Pending *Inter Partes* Review)
1133	Email from Justin Nemunaitis to Joe Jacobi (Jan. 16, 2024, 11:01 AM)

Exhibit	Description of Exhibits
1134	*In re Midwest Energy Emissions Corp. Patent Litig.*, MDL No. 3132 ECF 35 (J.P.M.L. Nov. 14, 2024) (Patent Owner's Reply Brief in Support of Consolidation)
1135	*Midwest Energy Emissions Corp. v. Arthur J. Gallagher & Co.*, No. 19-1334-RGACJB ECF 1 (D. Del. July 17, 2019) (Complaint for Patent Infringement)
1136	*Midwest Energy Emissions Corp. v. Arthur J. Gallagher & Co.*, No. 19-1334-RGACJB ECF 130 (D. Del. July 15, 2020) (First Amended Complaint for Patent Infringement)

Patent Owner ("PO") filed nearly identical POPR briefs for IPR2025-00280 and IPR2025-00281. Section II is identical between Petitioners' briefs.

I. INTRODUCTION

The Board previously instituted two petitions filed against the ancestor '147 Patent (IPR2020-00926, -928) and two against the counterpart '114 Patent (IPR2020-00832, -834). The IPRs did not proceed to final written decisions only because PO requested termination as part of settlement. In its Institution Decisions for IPR2020-00928 and IPR2020-00832, the Board found that neither patent could achieve earlier priority. In IPR2020-00832, the Board found that Sjostrom, Eckberg, and Olson-646 qualify as prior art, that there was motivation to combine, and that the combinations disclosed all limitations. IPR2020-00832, Paper 17. In its POPR, PO does not dispute the merits of the combinations of Sjostrom/Eckberg and Sjostrom/Olson-646, or that Olson-235 anticipates the claims, but contrary to the Board's prior decision, argues that the '517 Patent has an earlier priority date. PO also argues the Petition is time-barred. Each of these arguments is without merit.

II. THE PETITION IS NOT TIME-BARRED

Patent Owner's RPI/privity arguments should be rejected because they are entirely unsupported—precisely the kind of "[t]heoretical, hypothetical, or speculative" assertions that the Board has repeatedly found insufficient. *See ASSA ABLOY AB v. CPC Patent Techs. Pty*, IPR2022-01094, Paper 19 at 13–14 (P.T.A.B.

Feb. 2, 2023). Petitioners already confirmed that no unnamed party—including Talen, Chem-Mod, or any its affiliates—is funding the petition, advising on strategy, or controlling the decision to file or the arguments presented. IPR2025-00280, Paper 1 at 26-27; IPR2025-00281, Paper 1 at 1-2. Under the applicable standard—whether an "unnamed party is controlling, funding, or directing an IPR proceeding"—there are no unnamed RPIs. *Luminex Int'l Co. v. Signify Holdings B.V.*, IPR2024-00101, Paper 20 at 9, 23 (P.T.A.B. Nov. 21, 2024). Moreover, neither Talen nor Chem-Mod is a party in the MDL Court, and neither is defending/indemnifying Petitioners in any forum. PO's effort to manufacture a connection fails.

A. Patent Owner Misrepresents the 2020 IPR Proceedings

PO misrepresents the 2020 proceedings, because neither Talen nor NRG identified the parties the way PO claims, and the Board certainly did not agree. PO argues that "Talen specifically identified PacifiCorp as a real party in interest in its 2020 IPR" and that "NRG identified Chem-Mod as a real party in interest, and the Board agreed with NRG." POPR at 29, 33 n.7 (emphasis added).[1] PO is wrong.

[1] Chem-Mod supplying refined coal to both NRG and some of Petitioners is entirely irrelevant. *See Semiconductor Component Indus., LLC v. Greenthread*, IPR2024-00266, Papers 21 and 23 at 30 (P.T.A.B. Aug. 4, 2024) (do not apply "Section 315(b) to a party that may be a real party in interest to a conjectured privy of a petitioner").

Talen did not name PacifiCorp "as a real party in interest." Rather, Talen and the 2020 petitioners named two groups of companies: (i) "real-parties-in-interest" that were parties to the Delaware Lawsuit; and (ii) "potential real parties-in-interest" that included over 100 entities, named "out of an abundance of caution," that included co-owners of plants (e.g., PacifiCorp), vendors, and suppliers. IPR2020-00832, Paper 3 at 1-3. None of the 100+ companies in the second group "agreed to be listed as a real party-in-interest for this Petition" and "[n]one of these companies or any unnamed entity is funding, controlling, or directing, or otherwise has an opportunity to control or direct this Petition or proceeding." *Id.* at 2.

The Board found that the over-inclusive identification of "potential" RPIs "does not appear problematic," and there were "reasons for not committing those parties to the real party-in-interest category." IPR2020-00832, Paper 17 at 9; IPR2020-00834, Paper 18 at 11. Notably, the PTAB had not yet made precedential *SharkNinja*, which held that failing to name an RPI was "not jurisdictional" and that an unnamed RPI can be added later. *See SharkNinja Operating LLC v. iRobot Corp.*, IPR2020-00734, Paper 11 at 18-20 (P.T.A.B., designated precedential Dec. 4, 2020). At no point did the Board find PacifiCorp or Chem-Mod to be "actual" RPIs.

B. Patent Owner's RPI Analysis is Backwards

PO focuses its RPI arguments on the 2020 petitioners and Delaware defendants, but that is the wrong perspective. When determining time bar, the focus

should be on the current petitions. Section 315(b) asks whether "the petition requesting the proceeding" (e.g., IPR2025-00280 and -00281) is filed "more than 1 year after the date on which the petitioner, real party in interest, or privy of the petitioner" was served with a complaint. The "petitioner" is not Talen, Chem-Mod, or any Chem-Mod affiliate. The petitioners are BHE, WEC, etc., and the only relevant inquiry is whether Talen, Chem-Mod, or any unnamed party is an RPI to the current petition. PO does not argue these entities are RPIs to the current petitions.

C. There Is No Privity with the Delaware Defendants

None of the Petitioners were defendants in the Delaware Litigation, EX2003, and they are not privies to the 2020 petitioners or Delaware defendants. "A person who was not a party to a suit generally has not had a 'full and fair opportunity to litigate' the claims and issues in that suit," and "there is a general rule against nonparty preclusion." *WesternGeco LLC v. Ion Geophysical Corp.*, 889 F.3d 1308, 1319 (Fed. Cir. 2018) (quoting *Taylor v. Sturgell*, 553 U.S. 880, 892 (2008)). Petitioners did not have any opportunity to litigate the claims in the Delaware case or participate in the 2020 IPRs, and PO does not contend otherwise.[2]

[2] Also of note, the Delaware defendants did not even present evidence of invalidity at trial, and instead chose to present a pure non-infringement case. EX2004 at 117:2-4, 921:12-17, 1194:11-1120:8, 1135:13-16, 1139:11-1141:5.

Moreover, PO quotes the six privity factors in *Taylor v. Sturgell*, but does not demonstrate how even a single factor applies. POPR at 28-29.

PO falsely asserts that "Petitioners have argued that Chem-Mod and its affiliates defended [PO]'s infringement claims and negotiated a license on their behalf." POPR at 32 (citing Exhibit 2009 at 91, which does not mention Chem-Mod or its "affiliates"). Rather, certain Petitioners argued that PO cannot pursue infringement claims against refined coal that PO licensed. To be clear: none of Petitioners defended the Delaware Litigation or negotiated the previous licenses.

D. Each of the Unnamed Parties Is Licensed Under Patent Owner's Patents and Thus Have No Interest in These Proceedings

An additional reason that Talen, Chem-Mod, and Chem-Mod's affiliates are not named as an RPI or privy to the current Petitions is because each is licensed to the '517 Patent, and thus has no interest in the IPR proceedings. PO admits, "Talen defended that claim [of infringement from ME2C] and obtained a license." IPR2025-00280, Paper 15 at 8; IPR2025-00281, Paper 15 at 8. PO also concedes Chem-Mod and its affiliates have a license. EX2004 at 26:5-25, 391:19-392:13.

> The point is not to probe [Petitioner's] interest (it does not need any); rather, it is to probe the extent to which [the unnamed party] has an interest in and will benefit from [Petitioner's] actions, and inquire whether Petitioner can be said to be representing that interest after examining its relationship with [an unnamed party].

Applications in Internet Time, LLC v. RPX Corp., 897 F.3d 1336, 1353 (Fed. Cir. 2018). A third party with no interest is not an RPI/privy:

> There is no evidence that Mattel exercised any control over Petitioner's decision to file the Petition . . . and there is no indication that Mattel had any authority to do so. The record does not suggest that Mattel provided any funding for this inter partes review. Nothing in the record suggests that Petitioner is an agent of Mattel or acting as its proxy to challenge the '184 patent. There is also no evidence that Mattel desires review of the patent, or that the Petition was filed at Mattel's behest. In fact, the record is to the contrary—it appears that Mattel has no interest in obtaining a judgement of unpatentability.

See Google LLC v. DDC Tech., LLC, IPR2023-00708, Paper 41 (public version of Paper 29) at 27 (P.T.A.B. Oct. 25, 2023). So too with Talen, Chem-Mod, and its affiliates; the Petitions cannot be said to have been filed at their behest. *See Luminex*, IPR2024-00101, Paper 20 at 8-9, 20 ("behest" standard is central to RPI and privity); *JP Morgan Chase & Co. v. Maxim Integrated Prods., Inc.*, CBM2014-00179, 2015 WL 780869, at *7 (P.T.A.B. Feb. 20, 2015) (entity whose claims had been settled was not RPI, as that entity "no longer 'desires review'" of the patent).

This is not a case in which any Petitioner is seeking a second bite at the apple. Rather, PO sued Talen and Chem-Mod in 2019, fully licensed its patents, and then (over four years later) sued several of the current Petitioners. PO is responsible for "choosing to stagger the filing of its infringement suits." *Arista Networks, Inc. v. Orckit Corp.*, IPR2024-01239, Paper 7 at 3-4 (P.T.A.B. Mar. 12, 2025); *see ASSA ABLOY*, IPR2022-01094, Paper 19 at 33 ("Patent Owner ignores the practical consequences of its own actions that precipitated the current situation.").

E. A Generic Business Relationship Is Insufficient for RPI or Privity

The fact that Talen and PacifiCorp co-own a single power plant (among many other co-owners, EX1113) is not sufficient to create RPI or privity. Nor is it sufficient that Chem-Mod and its affiliates supplied refined coal to some of Petitioners through agreements that expired in 2021. This is nothing "other than a traditional business relationship between [third party] and Petitioner," which "does *not* establish a relationship sufficient to make [the third party] a real party-in-interest or a privy of Petitioner in this *inter partes* review." *Assa Abloy*, IPR2022-01094, Paper 19 at 35. Unlike in *Ventex*, there is no evidence that any unnamed third parties are "funding this IPR proceeding." *See id.* at 25-26 (distinguishing *Ventex Co. v. Columbia Sportswear N. Am.*, IPR2017-00651, Paper 148 (P.T.A.B. Jan. 24, 2019)). "The mere existence of some relationship between a petitioner and another entity is not sufficient—that relationship must be related to the lawsuit and be sufficiently close that it can be fairly said the petitioner had a full and fair opportunity to litigate the validity of the patent in that lawsuit." *See Google*, IPR2023-00708, Paper 41 at 23; *see WesternGeco*, 889 F.3d at 1319 ("general rule against nonparty preclusion").

F. Generic Indemnity Provisions Do Not Create RPI or Privity

PO's main argument is that agreements with Chem-Mod and certain Chem-Mod affiliates that made Refined Coal (Louisa, Portage, Arbor Fuels) "contain indemnity provisions." POPR at 31 (citing EX2038-EX2041). But an "indemnity provision does not amount to a sufficiently-close relationship to warrant … privity."

WesternGeco, 889 F.3d at 1321-22.

PO cites an agreement between WPL and Portage Fuels that expired in 2021 with generic indemnification language regarding patent infringement. POPR at 31 (citing EX2037). The Director has already explained, however, that the question of whether "a standard, non-exclusive, manufacturer-customer indemnification agreement relating to patent infringement can be sufficient to support a finding of real party in interest and trigger the one-year time bar" has already been answered: "without more, it cannot." *Luminex*, IPR2024-00101, Paper 20 at 11. PO has not identified that "something more." PO also did not disclose that these agreements all expired in 2021; or that the Chem-Mod entities have no current relationship with Petitioners. *See ASSA ABLOY*, IPR2022-01094, Paper 19 at 34 (no privity where option to indemnify was not exercised).

The relationship between Arbor Fuels and a subsidiary of Petitioner WEC is even more tenuous (PO incorrectly names WPSC as the parent of WEC). POPR at 32-33. There is "no authority" to apply "Section 315(b) to a party that may be a real party in interest to a conjectured privy of a petitioner." *Semiconductor Component Indus. v. Greenthread*, IPR2024-00266, Paper 23 at 30 (P.T.A.B. Aug. 4, 2024).

PO cites to *Ventex* and suggests that because the petitioner in that case "was obligated to indemnify" an accused infringer (that was not a petitioner), the Board found the accused infringer "was a real party in interest with respect to [petitioner]."

POPR at 28. But "Patent Owner mischaracterizes the holding in *Ventex*. The existence of an indemnification agreement was not the determining factor in finding the existence of an RPI relationship," because "the Board has held repeatedly that an indemnification agreement, without something more, is insufficient to establish an RPI relationship." *See ASSA ABLOY*, IPR2022-01094, Paper 19 at 33.

PO cites to *Greenthread* and argues that "sales agreements that included indemnity provisions … can create privity." POPR at 30. In *Greenthread*, the Director did not rule on the ultimate issue of privity, but instead faulted the Board for "denying the discovery motions." *Semiconductor Components Indus. v. Greenthread, LLC*, IPR2023-01242, Paper 94 at 2-3 (P.T.A.B. Apr. 24, 2025). Here, Petitioners *agreed* to PO's discovery requests before PO filed its POPR.

III. THE '517 PATENT IS NOT ENTITLED TO EARLIER PRIORITY

PO's only response to Sjostrom, Eckberg, Olson-646, and Olson-235 is that they are not prior art because the '517 Patent can purportedly trace priority to a provisional application ("Provisional") filed in 2004. For the related '114 Patent—which is "from the same patent family and cover[s] similar subject matter" (EX1134; *see also* EX1114 at 20-25)—the Board rejected this argument: "one or more of the applications in the priority chain for the '114 patent lacks written description support for the challenged claims." IPR2020-00832, Paper 17 at 25. Likewise, for the '147 Patent (a parent to the '517 Patent), the Board granted institution, holding:

> Petitioner has demonstrated that one or more of the applications in the priority chain for the '147 patent lack written description support for challenged claims 18 and 19. Patent Owner, on this record, has not presented persuasive arguments or evidence that claims 18 and 19 … are entitled to a priority date earlier than April 6, 2009, the filing date of the [application resulting in the '147 Patent].

NRG, IPR2020-00928, Paper 17 at 32. If the '147 Patent does not have priority before 2009, its child patent (the '517 Patent) does not either, and thus Sjostrom, Olson-646, and Eckberg (each from 2005-2006) are prior art.

A. The Board Determined the Incorporation Statement Was Unclear

The Board previously held in two proceedings that the Provisional could not be incorporated by reference into the '114 Patent (counterpart of '517 Patent) and '147 Patent (parent to '517 Patent), because the incorporation statements were unclear. IPR2020-00832, Paper 17 at 30 (counterpart of '517 Patent—stating it "is unclear to us what the term 'to the extent appropriate' means in this context."); IPR2020-00928, Paper 17 at 32 (parent to '517 Patent); *see also* IPR2025-00281, Paper 1. The Board relied on *Zenon*, which held that the "plain language expressly limits the incorporation to only relevant disclosures of the patents, indicating that the disclosures are not being incorporated in their entirety." *Zenon Env't., Inc. v. U.S. Filter Corp.*, 506 F.3d 1370, 1379 (Fed. Cir. 2007). PO ignores the *Zenon* case.

B. The Board Determined that the Provisional Was "Essential" Material that Could Not Be Incorporated by Reference

Another reason the '114 Patent (counterpart) and the '147 Patent (parent to

'517 Patent) could not achieve priority to 2004 was because the Provisional was "essential" material to those claims, and essential material may not be incorporated by reference from an unpublished patent application under 37 C.F.R. § 1.57(d). IPR2020-00832, Paper 17 at 29; IPR2020-00928, Paper 17 at 23-24. PO argues the Board got it wrong by citing to M.P.E.P. 608.01(p) and *Maquet Cardiovascular LLC v. Abiomed, Inc.*, 627 F. Supp. 3d 72, 78-84 (D. Mass Sept. 12, 2022). POPR at 1-2. Petitioners addressed these sources in the Petition. *See* IPR2025-00281, Paper 1 at 32-39. PO is wrong.

1. The Board's Decision Is Consistent with *Maquet*

PO argues that the Board should change its mind because of a subsequent district court case, *Maquet*. POPR at 6-7. *Maquet* analyzed whether material from an unpublished application is "essential" to support claim limitations in the challenged patent, and also whether the unpublished application supports claims of any intervening applications. *See Maquet*, 627 F. Supp. 3d at 81-82; IPR2025-00281, Paper 1 at 32 (discussing *Maquet*). The '517 Patent claims priority to the '147 Patent and '225 Patent, each of which have claims whose sole support (if any) is from the Provisional. EX1004. Claims 18-19 of the '147 Patent require "injecting the particulate sorbent material at a sorbent material injection rate and injecting separately the bromine containing promoter into [cl. 19—a mercury containing gas that is a transport gas] whereby in-flight reaction produces the promoted brominated

sorbent." IPR2025-00281, Paper 1 at 33; *see* IPR2020-00928, Paper 17 at 29 (finding in the '147 Patent that "[t]here is no suggestion that bromine and the activated carbon are separately injected into mercury-containing flue gas"). Claims 14 and 23 of the '225 Patent have similar problems. These claims require "combusting coal in a combustor comprising pyrolysis char and an additive comprising HBr, a bromide compound, or a combination thereof, to form the mercury-containing gas" and "the sorbent is free of contact with a halogen or halide promoter prior to the addition of the sorbent to the mercury-containing gas," respectively. IPR2025-00281, Paper 1 at 36. Support for these limitations (if any) would come from the Provisional, whose text was not included the '147 Patent, the '225 Patent, or any intervening applications. *Id.* at 28. There is a break in priority, as the Provisional is essential material.

2. The Board's Decision Is Consistent with MPEP 608.01(p)

PO faults the Board's prior decision for not citing M.P.E.P. 608.01, but the Petition explained this provision in depth. IPR2025-00281, Paper 1 at 38-39. Because a provisional is unpublished and cannot be incorporated by reference under 37 C.F.R. §1.57(d), an applicant can add omitted material from a provisional—but the "application must be amended to include the inadvertently omitted portion of the specification or drawing(s) … in no case later than the close of prosecution" of the child application. M.P.E.P. 608.01(p)(I) (quoting 37 C.F.R. §1.57(b)). The physical

incorporation of the Provisional in April 2018 in the '970 Application was too late: the '517 Patent is the tenth non-provisional from the Provisional (EX1004); the Pre-2018 Applications were either abandoned or issued, but were never "amended to include the inadvertently omitted portion of the [Provisional before] the close of prosecution." 37 C.F.R. §1.57(b); *see* M.P.E.P. 217(III) (Example 3). The priority chain was broken.

C. The Parent Applications Do Not Support the '517 Patent Claims

In searching for disclosure in the parent applications, PO improperly applies an obviousness-type analysis, rather than a written-description analysis. For example, PO argues that Sjostrom uses an arrow to teach "adding bromine to the pulverized coal entering the boiler" (while also mentioning "coal additives"), and then states that "Petitioners cannot meaningfully contend that a POSITA would understand Sjostrom's arrow to disclose adding bromine to pulverized coal, but reach a different conclusion with respect to the provisional application." POPR at 23-24 & n.4; *see also id.* at 20-21. PO conflates two standards.

For priority, "[t]he question is not whether a claimed invention is an obvious variant of that which is disclosed in the specification. Rather, a prior application itself must describe an invention . . .." *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1571-72 (Fed. Cir. 1997); *see PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1306 (Fed. Cir. 2008) ("Entitlement to a filing date does not extend to

subject matter which is not disclosed, but would be obvious over what is expressly disclosed."). The parent applications fail to expressly or inherently disclose several claim limitations, so the '517 Patent cannot claim priority before 2018.

1. No Support for Adding Bromine-Containing Materials to Coal, Upstream of Combustion Chamber

The only support PO identified for adding bromine-containing ingredients to the coal upstream of the combustion chamber is reaction of certain materials with activated-carbon sorbent, and that "the inventive sorbent can be injected where desired (e.g., before, after, or within the boiler."). POPR at 14-15 (citing to '595 Application ¶ 107). The Board expressly rejected this argument:

> Although this describes other injection points ("e.g., before, after, or within the boiler"), this disclosure regards the promoted sorbent material. As a result, it describes the addition of both the promoter and the sorbent material at a single point, not (1) the addition of the promoter with the coal or the combustion chamber and (2) the injection of the sorbent material into mercury-containing gas downstream of the combustion chamber, as claims 1 and 23–25 of the '114 patent recite. As a result, we do not agree with Patent Owner's arguments regarding paragraph 107 of the '595 application.

IPR2020-00832, Paper 17 at 24. PO presents no reason for a different result.

PO's arguments for the Post-2018 Applications and Provisional fare no better. PO cites Provisional Figure 2. POPR at 12, 15-16. This figure fails to expressly disclose any bromine-containing ingredients added "to the coal." Even if added upstream of the combustion chamber, they could be added via auxiliary systems not contacting coal. IPR2025-00281, Paper 1 at 41-44; EX1002 ¶¶178-183.

2. No Support for Adding Br_2 or Bromide Compounds to Coal, Upstream of the Combustion Chamber

Even if the Provisional could be incorporated, there is still no written-description support for adding to the coal each of Br_2 and "bromide compounds." IPR2025-00281, Paper 1 at 40-41. PO's only response is that the specification discloses a chemical model in which Br_2 reacts with activated carbon downstream of the combustion chamber, but that says nothing about whether Br_2 is added to coal rather than formed in situ or added downstream. POPR at 17.

PO's reliance on HBr in Example 1E from the Provisional—which was not carried forward into the non-provisional applications until 2018—does not support the '517 Patent claims. A disclosure of one species (HBr) does not disclose other species (e.g., Br_2), and it does not disclose the broad class of "bromide compound." IPR2025-00281, Paper 1 at 40-41. PO's reliance on "common attributes or features possessed by the members of the genus in view of the species discloses" (POPR at 20) does not apply, as HBr and Br_2 have different properties and attributes. EX1002 ¶419. PO does not explain how a disclosure of one species discloses other species or the entire genus.

IV. CONCLUSION

Petitioners respectfully request that IPR of the '517 Patent be instituted and that the Challenged Claims be cancelled as unpatentable.

Respectfully submitted,

July 9, 2025
Date

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ATTORNEYS FOR PETITIONERS

CERTIFICATE OF SERVICE

Pursuant to 37 CFR § 42.6(e)(4), the undersigned certifies that on July 9, 2025, a complete copy of the foregoing Petitioners' Authorized Reply to Patent Owner's Preliminary Response was served on Lead and Back-up Counsel for Petitioner at the service address provided in Patent Owner's Mandatory Notices:

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