IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF IOWA
CENTRAL DIVISION

IN RE: MIDWEST ENERGY EMISSIONS CORP. PATENT LITIGATION	MDL Case No. 4:24-md-03132-SHL-WPK

PLAINTIFF'S INITIAL INFRINGEMENT CONTENTIONS

Pursuant to Paragraph 5 of the Court's Case Management Order (ECF No. 60), Plaintiff Midwest Energy Emissions Corp. (n/k/a Birchtech Corp.) ("ME2C" or "Plaintiff") hereby submits this disclosure of initial infringement contentions to Defendants MidAmerican Energy Company ("MidAmerican"), PacifiCorp, Interstate Power and Light Company ("IPL"), Wisconsin Power and Light Company ("WPL"), Ameren Corp. ("Ameren"), Union Electric Co. d/b/a/ Ameren Missouri ("Ameren Missouri"), Evergy, Inc., Evergy Metro, Inc., Evergy Missouri West, Inc., and Evergy Kansas Central, Inc. (collectively, "Defendants").

ME2C provides initial claim charts relating each known accused product to the asserted claims each such product allegedly infringes. ME2C submits these disclosures based upon information it has acquired to date, as it presently understands this information and the significance thereof. Accordingly, ME2C reserves the right to modify, amend, retract, and/or supplement the disclosures made herein as additional evidence and information becomes available.

ME2C has accused each of the Defendants of direct infringement, literally and/or under the doctrine of equivalents. In particular, each of the Defendants owns and/or operates one or more of the Accused Coal Plants, which combust coal in a combustion chamber with bromine, bromide, iodine, and/or iodide that has been added to the coal and/or that has been provided to the

combustion chamber, and where they inject a sorbent material comprising activated carbon downstream of the combustion chamber and collect mercury bound to activated carbon in a particulate collection device (e.g., baghouse or ESP). Specifically, the Labadie Energy Center, Rush Island Energy Center, Sioux Energy Center, Walter Scott Jr., Energy Center, Louisa Energy Center, George Neal North, George Neal South, Ottumwa Generating Station, Prairie Creek Generating Station, Columbia Energy Center, Edgewater Generating Station, Wyodak Power Plant, Jim Bridger Power Plant, Dave Johnston Power Plant, Hawthorn Station, and Jeffrey Energy Center have combusted coal in a combustion chamber with an added bromine additive and also used activated carbon sorbent during the damages period for this case. At least the George Neal North, Louisa, George Neal South, Jim Bridger, and Sioux power plants have combusted coal in a combustion chamber with an added iodine additive and also used activated carbon sorbent during the damages period for this case. Exemplary evidence of Defendants' infringement currently available to ME2C can be found in public information regarding operation of the Accused Coal Plants, as well as documents and expert reports produced and served in *Midwest Energy Emissions Corp., et al. v. Arthur J. Gallagher & Co., et al.*, C.A. No. 19-1334 (CJB) (D. Del.).[1] ME2C has compiled exemplary evidence of Defendants' infringement in Attachment A hereto.

All Patents-in-Suit claim priority to U.S. Provisional Patent App. No. 60/605,640, filed on August 30, 2004. *See* ME2C_SDIA-00014229–ME2C_SDIA-00014253. However, the inventors conceived of each of the claims of the patents-in-suit in 2002, no later than August 30, 2002. They reduced the inventions to practice sometime thereafter through testing at the EERC's Pilot Test

[1] *See* Attachment A; *see also, e.g.*, ME2C_SDIA-00017995–ME2C_SDIA-00018005; ME2C_SDIA-00018065–ME2C_SDIA-00018076; ME2C_SDIA-00018079; ME2C_SDIA-00018164–ME2C_SDIA-00018174; ME2C_SDIA-00018481–ME2C_SDIA-00018491; ME2C_SDIA-00018843–ME2C_SDIA-00018854; ME2C_SDIA-00019272–ME2C_SDIA-00019273; ME2C_SDIA-00019448–ME2C_SDIA-00019457; ME2C_SDIA-00015321-ME2C_SDIA-00015518 (O'Keefe Opening Report); ME2C_SDIA-00015728 (O'Keefe Reply Report).

Combustor (PTC), and in no event later than September 2003. *See* ME2C_SDIA-00013627–ME2C_SDIA-00013642; ME2C_SDIA-00014295–ME2C_SDIA-00014380; ME2C_SDIA-00019932–ME2C_SDIA-00020961; *see also Midwest Energy Emissions Corp. v. Berkshire Hathaway Energy Co., et al.*, No. 4:24-cv-00243-SHL-WPK (S.D. Iowa), ECF Nos. 138, 138-1 to 138-9.

DATED: March 18, 2025

Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that counsel of record is being served with a copy of the foregoing document via electronic mail on March 18, 2025.

/s/ *Justin T. Nemunaitis*
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’114 Initial Claim Chart

No.	’114 Claim Element	Accused Conduct
1a	A method of separating mercury from a mercury-containing gas, the method comprising:	This preamble is non-limiting. Nonetheless, at the Accused Coal Plants, Defendants perform a method of separating mercury from a mercury-containing gas by using coal additives, activated carbon sorbent, and pollution control devices at each of the Accused Coal Plants.
1b	combusting coal in a combustion chamber, to provide the mercury-containing gas,	Each Accused Coal Plant combusts coal resulting in a mercury-containing gas.
1c	wherein the mercury-containing gas comprises a halogen or halide promoter comprising HBr, Br^-, or a combination thereof, wherein the coal comprises added Br_2, HBr, Br^-, or a combination thereof, added to the coal upstream of the combustion chamber, or the combustion chamber comprises added Br_2, HBr, Br^-, or a combination thereof, or a combination thereof;	The resulting mercury-containing gas comprises halogen or halide promoter comprising HBr, Br^-, or a combination thereof, wherein the coal comprises added Br_2, HBr, Br^-, or a combination thereof, added to the coal upstream of the combustion chamber, or the combustion chamber comprises added Br_2, HBr, Br^-, or a combination thereof, or a combination thereof. This halogen or halide material is a promoter because it promotes the sorbent injected downstream of the combustion chamber. See, e.g., ’114 fig. 2; 12:9-27 (explaining that bromide, Br2, HBr, Br− and/or combinations thereof are promoters). In particular, the Accused Coal Plants have combusted coal that is treated with “bromine-containing salt solutions,” i.e., calcium bromide. Calcium bromide is a bromide and comprises a chemical form of Br−. Thus, calcium bromide, a bromide and a

No.	’114 Claim Element	Accused Conduct
		form of Br−, is added to the coal, and because the coal then added to the combustion chamber, calcium bromide (e.g. a form of Br−) is added to the combustion chamber. In addition, the combustion chamber comprises added Br2, HBr, Br−, and/or bromide because one or more of these are produced during combustion from the bromine that was added to the coal. *See* Attachment A.
1d	injecting a sorbent material comprising activated carbon into the mercury-containing gas downstream of the combustion chamber;	The Accused Coal Plants inject a sorbent material comprising activated carbon into the mercury-containing gas downstream of the combustion chamber. *See* Attachment A; *see also, e.g.*, ME2C_SDIA-00019455.
1e	contacting mercury in the mercury-containing gas with the sorbent, to form a mercury/sorbent composition;	The Accused Coal Plants contact mercury in the mercury-containing gas with the sorbent, to form a mercury/sorbent composition. In particular, by injecting the activated carbon sorbent into the mercury-containing gas, the sorbent contacts the mercury to form a mercury/sorbent composition.
1f	separating the mercury/sorbent composition from the mercury-containing gas, to form a cleaned gas;	The Accused Coal Plants separate the mercury/sorbent composition from the mercury-containing gas, to form a cleaned gas, otherwise they would not be able to comply with MATS regulations.

No.	’114 Claim Element	Accused Conduct
1g	monitoring the mercury content of the cleaned gas; and	The Accused Coal Plants monitor the mercury content of the cleaned gas, otherwise they would not be able to comply with MATS regulations.
1h	controlling, in response to the monitored mercury content of the cleaned gas, an injection rate of injecting the sorbent into the mercury-containing gas, the sorbent composition, or a combination thereof, so that the mercury content of the cleaned gas is maintained at or below a desired level.	The Accused Coal Plants control, in response to the monitored mercury content of the cleaned gas, an injection rate of injecting the sorbent into the mercury-containing gas, the sorbent composition, or a combination thereof, so that the mercury content of the cleaned gas is maintained at or below a desired level. In particular, the Accused Coal Plants adjust the injection rate of activated carbon in response to operational circumstances, such as changes in the amount of mercury in the coal being combusted. Adjustments for mercury capture are a necessary feature of this process to account for changes in coal quality, changes in load, changes in daily operations, or changes in equipment operations. Moreover, because regulations allow mercury measurements to be averaged, adjustments need to be made over time to ensure the average measured mercury emissions meets MATS requirements.
2	The method of claim 1, comprising removing greater than 70 wt % of the mercury in the mercury-containing gas.	The Accused Coal Plants must remove greater than 70 wt % of the mercury in the mercury-containing gas, otherwise they would not be able to comply with MATS regulations.

No.	’114 Claim Element	Accused Conduct
3	The method of claim 1, comprising removing greater than 70 wt % of the mercury in the mercury-containing gas on the sorbent.	See claim 2. Mercury binds to the sorbent, and the sorbent is then removed from the mercury-containing gas.
4	The method of claim 1, wherein the sorbent in the mercury-containing gas comprises about 1 g to about 30 g of the halogen or halide promoter per 100 g of the sorbent material.	The Accused Coal Plants inject activated carbon sorbent such that the sorbent in the mercury-containing gas comprises about 1 g to about 30 g of the CaBr per 100 g of the sorbent material. Based on ME2C’s experience in supplying and consulting on mercury capture for coal plants, the Accused Coal Plants must use a ratio within this range because using too little bromine relative to the activated carbon would be ineffective, and using too much bromine relative to the activated carbon would be costly without providing a meaningful benefit in mercury capture.
5	The method of claim 1, wherein the combustion chamber comprises the halogen or halide promoter.	See 1c.
6	The method of claim 1, wherein the coal comprises added Br_2, HBr, Br^-, or a combination thereof, added to the coal upstream of the combustion chamber.	See 1c.

No.	’114 Claim Element	Accused Conduct
7	The method of claim 1, wherein the promoter is contacted with the sorbent in vapor form, gaseous form, liquid form, or in an organic solvent.	Given the temperatures of coal combustion at the Accused Coal Plants, the promoter is in gaseous or vapor form when it contacts the sorbent.
12	The method of claim 1, wherein the activated carbon comprises powdered activated carbon, granular activated carbon, or a combination thereof.	See 1d.
15	The method of claim 1, wherein the combustion chamber comprises a boiler.	See 1a.
16	The method of claim 1, wherein the mercury-containing gas is a flue gas.	The combustion gases exiting the combustion chamber is a flue gas. Thus, mercury-containing gas is a flue gas.
18	The method of claim 1, wherein the injection of the sorbent material into the mercury-containing gas occurs upstream of a particulate separator or a scrubber.	See 1d. Each of the Accused Coal Plants injects sorbent upstream of an electrostatic precipitator or baghouse or scrubber.
20	The method of claim 1, wherein the combustion chamber comprises added Br_2, HBr, Br^-, or a combination thereof.	See 1c.
23a	A method of separating mercury from a mercury-containing gas, the method comprising:	See 1a.

No.	’114 Claim Element	Accused Conduct
23b	combusting coal in a combustion chamber, to provide the mercury-containing gas, wherein the mercury-containing gas comprises a halogen or halide promoter comprising HBr, Br^-, or a combination thereof, wherein	See 1b.
23c	the mercury-containing gas comprises a halogen or halide promoter comprising HBr, Br^-, or a combination thereof, wherein the coal comprises added Br_2, HBr, Br^-, or a combination thereof, added to the coal upstream of the combustion chamber, or the combustion chamber comprises added Br_2, HBr, Br^-, or a combination thereof, or a combination thereof;	See 1c.
23d	injecting a sorbent material comprising activated carbon into the mercury-containing gas downstream of the combustion chamber;	See 1d.
23e	contacting mercury in the mercury-containing gas with the sorbent, to form a mercury/sorbent composition; and	See 1e.
23f	separating the mercury/sorbent composition from the mercury-containing gas, to form a cleaned gas.	See 1f.

No.	’114 Claim Element	Accused Conduct
24a	A method of separating mercury from a mercury-containing gas, the method comprising:	See 1a.
24b	combusting coal in a combustion chamber, to provide the mercury-containing gas, wherein the mercury-containing gas comprises a halogen or halide promoter comprising HBr, Br^-, or a combination thereof, wherein	See 1b.
24c	the mercury-containing gas comprises a halogen or halide promoter comprising HBr, Br^-, or a combination thereof, wherein the coal comprises added Br_2, HBr, Br^-, or a combination thereof, added to the coal upstream of the combustion chamber, or the combustion chamber comprises added Br_2, HBr, Br^-, or a combination thereof, or a combination thereof;	See 1c.
24d	injecting a sorbent material comprising activated carbon into the mercury-containing gas downstream of the combustion chamber such that the activated carbon reacts with the halogen or halide promoter in the mercury-containing gas to form a promoted sorbent;	See 1d.

No.	’114 Claim Element	Accused Conduct
24e	such that the activated carbon reacts with the halogen or halide promoter in the mercury-containing gas to form a promoted sorbent;	Because the Accused Coal Plants inject activated carbon into gas containing halogen or halide promoter, the activated carbon and promoter react to form a promoted sorbent.
24f	contacting mercury in the mercury-containing gas with the promoted sorbent, to form a mercury/sorbent composition;	See 1e.
24g	separating the mercury/sorbent composition from the mercury-containing gas, to form a cleaned gas;	See 1f.
24h	monitoring the mercury content of the cleaned gas; and	See 1g.
24i	controlling, in response to the mercury content of the cleaned gas, an injection rate of injecting the sorbent into the mercury-containing gas, a rate of addition to the coal or the combustion chamber of the added Br_2, HBr, the bromide compound, or a combination thereof, or a combination thereof, so that the mercury content of the cleaned gas is maintained at or below a desired level.	See 1h.
25a	A method of separating mercury from a mercury-containing gas, the method comprising:	See 1a.

No.	’114 Claim Element	Accused Conduct
25b	combusting coal in a combustion chamber, to provide the mercury-containing gas, wherein	See 1b.
25c	the coal comprises added Br_2, HBr, a bromide compound, or a combination thereof, added to the coal upstream of the combustion chamber, or the combustion chamber comprises added Br_2, HBr, a bromide compound, or a combination thereof, or a combination thereof,	See 1c.
25d	injecting a sorbent material comprising activated carbon into the mercury-containing gas downstream of the combustion chamber;	See 1d.
25e	contacting mercury in the mercury-containing gas with the sorbent, to form a mercury/sorbent composition; and	See 1e.
25f	separating the mercury/sorbent composition from the mercury-containing gas, to form a cleaned gas.	See 1f.
26	The method of claim 25, wherein the coal comprises the added Br_2, HBr, the bromide compound, or a combination thereof, added to the coal upstream of the combustion chamber.	See 1c.

No.	’114 Claim Element	Accused Conduct
27	The method of claim 25, wherein the combustion chamber comprises the added Br_2, HBr, the bromide compound, or a combination thereof.	See 1c.
28a	The method of claim 25, further comprising monitoring the mercury content of the cleaned gas; and	See 1g.
28b	controlling, in response to the mercury content of the cleaned gas, an injection rate of injecting the sorbent into the mercury-containing gas, a rate of addition to the coal or the combustion chamber of the added Br_2, HBr, the bromide compound, or a combination thereof, or a combination thereof, so that the mercury content of the cleaned gas is maintained at or below a desired level.	See 1h.
29	The method of claim 25, wherein the mercury-containing gas comprises about 1 g to about 30 g of the element bromine per 100 g of the sorbent.	See claim 4.
30	The method of claim 25, wherein the mercury/sorbent composition comprises the element bromine, the sorbent material, and mercury.	See 24e.

’225 Initial Claim Chart

No.	’225 Claim Element	Accused Conduct
1a	A method for treating a mercury-containing gas, the method comprising:	See ’114 1a.
1b	combusting a mixture comprising coal, pyrolysis char, and an additive comprising HBr, a bromide compound, or a combination thereof, to form the mercury-containing, gas; and	See ’114 1b, 1c. In addition, combusted coal forms pyrolysis char.
1c	adding a particulate sorbent material comprising activated carbon into the mercury-containing gas.	See ’114 1d
2	The method of claim 1, wherein the pyrolysis char is a promoted pyrolysis char.	The Accused Coal Plants combust promoted pyrolysis char. The pyrolysis char forms in the presence of bromine that has been added to the coal. Thus, it is promoted pyrolysis char. See, e.g., ’114 patent Fig. 2.
5	The method of claim 1, further comprising using a particle separation device to remove mercury from the flue gas and comprising collecting greater than 70 wt % of the mercury in the mercury-containing gas to produce a cleaned gas.	See ’114 claim 2
6a	The method of claim 5, further comprising:	See ’114 1g
6b	measuring the mercury content of the mercury-containing gas; and	See ’114 1g

No.	’225 Claim Element	Accused Conduct
6c	modifying, in response to the measured mercury content:	See ’114 1h
6d	an injection rate of injecting the sorbent into the mercury-containing gas,	See ’114 1h
6e	an amount of the additive in the mixture, or	See ’114 1h
6f	a combination thereof.	See ’114 1h
8	The method of claim 1, wherein the sorbent material is chosen from powdered activated carbon, granular activated carbon, carbon black, carbon fiber, aerogel carbon, pyrolysis char, and combinations thereof.	See ’114 claim 12
9	The method of claim 1, further comprising adding an alkaline component to the mercury-containing gas, the alkaline component chosen from alkali elements, alkaline earth elements, alkali salts, alkaline earth salts, and combinations thereof.	Various Defendants have added S-Sorb, which includes alkaline, to the coal provided to the Accused Coal Plants. The Accused Coal Plants then inject the S-Sorb with the coal into the combustion chamber, thus adding it to the mercury-containing gas. See Attachment A.
14a	A method for treating a mercury-containing gas, the method comprising:	See 1a
14b	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	See 1b

No.	’225 Claim Element	Accused Conduct
14c	adding a particulate sorbent material comprising activated carbon into the mercury-containing gas.	See 1c
15	The method of claim 14, wherein the pyrolysis char is a promoted pyrolysis char.	See 2
17a	A method for treating a mercury-containing gas, the method comprising:	See 1a
17b	combusting a mixture comprising coal, pyrolysis char, and an additive comprising HBr, a bromide compound, or a combination thereof, to form the mercury-containing gas; and	See 1b
17c	adding a sorbent material comprising activated carbon into the mercury-containing gas.	See 1c
18a	The method of claim 1, further comprising	See 6a
18b	modifying, in response to a measured mercury content,	See 6c
18c	an injection rate of injecting the sorbent into the mercury-containing gas,	See 6d
18d	an amount of the additive in the mixture, or	See 6e
18e	a combination thereof.	See 6f

No.	’225 Claim Element	Accused Conduct
20	The method of claim 1, wherein the coal is combusted in a combustion chamber at a coal-combustion facility, wherein the HBr, bromide compound, or combination thereof, is added to the coal before the coal enters the combustion chamber, wherein the addition of the HBr, bromide compound, or combination thereof, to the coal is performed at the coal-combustion facility.	See ’114 1c, 6
23	The method of claim 1, wherein the sorbent is free of contact with a halogen or halide promoter prior to the addition of the sorbent to the mercury-containing gas.	See ’114 claim 13
25	The method of claim 1, wherein the coal comprises subbituminous coal.	According to public EIA data, the Accused Coal Plants combust or have combusted subbituminous coal. *See, e.g.*, ME2C_SDIA-00019455.
27	The method of claim 1, wherein the mixture is combusted in a combustion chamber of a coal-combustion facility upstream of a scrubber, a particulate control system, or a combination thereof, wherein the particulate sorbent is added to the mercury-containing gas before the mercury-containing gas encounters the scrubber, the particulate control system, or the combination thereof.	See ’114 claim 18.
28	The method of claim 26, wherein the particulate control system comprises an electrostatic precipitator, a baghouse, a fabric filter, or a combination thereof.	See ’114 claim 18.

’517 Claim Chart

No.	’517 Claim Element	Accused Conduct
1a	A method for reducing mercury in a mercury-containing gas, the method comprising:	See ’114 1a
1b	combusting coal in a combustion chamber, the coal comprising an additive comprising Br_2, HBr, a bromide compound, or a combination thereof, to form the mercury-containing gas; and	See ’114 1b
1c	collecting mercury in the mercury-containing gas with a sorbent added to the mercury-containing gas, the sorbent comprising activated carbon.	See ’114 1d, 1e
2	The method of claim 1, further comprising injecting an alkaline sorbent into the mercury-containing gas stream.	See ’225 claim 9
3	The method of claim 2, wherein the alkaline sorbent is selected from the group consisting of alkali elements, alkaline earth elements, alkali salts, alkaline earth salts, and combinations thereof.	See ’225 claim 9
4	The method of claim 1, wherein the activated carbon is chosen from powdered activated carbon, granular activated carbon, carbon black, carbon fiber, aerogel carbon, pyrolysis char, and combinations thereof.	See ’114 claim 12
5	The method of claim 1, wherein the sorbent has a composition comprising from about 1 to about 30 grams of the element bromine per 100 grams of activated carbon.	See ’114 claim 4

No.	’517 Claim Element	Accused Conduct
6	The method of claim 1, comprising collecting greater than 70 wt % of the mercury in the mercury-containing gas.	See ’114 claim 2
7	The method of claim 1, comprising collecting greater than 70 wt % of the mercury in the mercury-containing gas with the sorbent.	See ’114 claim 3
8a	The method of claim 1, further comprising:	See ’114 1g
8b	measuring mercury content of the mercury-containing gas; and	See ’114 1g
8c	modifying, in response to the measured mercury content,	See ’114 1h
8d	an injection rate of injecting the sorbent comprising activated carbon into the mercury-containing gas,	See ’114 1h
8e	an amount of the additive comprising the Br_2, HBr, bromide compound, or a combination thereof, added to the coal, or	See ’114 1h
8f	a combination thereof.	See ’114 1h
9	The method of claim 8, wherein the measuring of the mercury content of the mercury-containing gas is performed substantially continuously.	See ’225 claim 24
10a	The method of claim 1, further comprising:	See ’114 1h
10b	modifying, in response to a measured mercury content,	See ’114 1h

No.	’517 Claim Element	Accused Conduct
10c	an injection rate of injecting the sorbent comprising activated carbon into the mercury-containing gas,	See ’114 1h
10d	an amount of the Br_2, HBr, bromide compound, or a combination thereof, added to the coal, or	See ’114 1h
10e	a combination thereof.	See ’114 1h
11	The method of claim 1, wherein the coal comprises a subbituminous coal.	See ’225 claim 25
13	The method of claim 1, wherein the coal comprises the added Br_2, HBr, the bromide compound, or a combination thereof, added to the coal before the coal enters the combustion chamber.	See ’114 claim 1c, 6
14	The method of claim 1, wherein the combustion chamber comprises the added Br_2, HBr, the bromide compound, or a combination thereof.	See ’114 claim 20
15	The method of claim 1, wherein the coal is combusted in the combustion chamber at a coal-combustion facility, wherein the Br_2, HBr, bromide compound, or combination thereof, is added to the coal before the coal enters the combustion chamber, wherein the addition of the Br_2, HBr, bromide compound, or combination thereof, to the coal is performed at the coal-combustion facility.	See claim 13
17	The method of claim 1, wherein the combustion chamber is an electric utility coal combustion chamber.	Each of the Accused Coal Plants contain electric utility coal combustion chambers.

No.	’517 Claim Element	Accused Conduct
18a	The method of claim 1, further comprising:	See ’114 1g
18b	measuring mercury content of the mercury-containing gas; and	See ’114 1g
18c	modifying, in response to the measured mercury content, an injection rate of injecting the sorbent comprising activated carbon into the mercury-containing gas.	See ’114 1gh
19	The method of claim 1, wherein the mercury-containing gas comprises about 1 g to about 30 g of the element bromine per 100 g of the sorbent.	See ’114 claim 4
21	The method of claim 1, wherein the sorbent in the mercury-containing gas comprises about 1 g to about 30 g of the added Br_2, HBr, the bromide compound, or a combination thereof, per 100 g of the sorbent.	See ’114 claim 4
22	The method of claim 1, wherein the Br_2, HBr, or the bromide compound is contacted with the sorbent in vapor form, gaseous form, liquid form, or in an organic solvent.	See ’114 claim 7.
24	The method of claim 1, wherein the sorbent injected into the mercury-containing gas is free of contact with a halogen or halide promoter prior to injection of the sorbent into the mercury-containing gas.	See ’114 claim 13
25	The method of claim 1, wherein the injection of the sorbent into the mercury-containing gas occurs upstream of a particulate separator or a scrubber.	See ’114 claim 18

No.	’517 Claim Element	Accused Conduct
26	The method of claim 25, wherein the particulate separator comprises an electrostatic precipitator, a baghouse, a fabric filter, or a combination thereof.	See ’114 claim 18
29a	A method of separating mercury from a mercury-containing gas, the method comprising:	See ’114 1a
29b	combusting coal in a combustion chamber, wherein	See ’114 1b
29c	the coal comprises added Br_2, HBr, bromide compound, or a combination thereof, added to the coal before the coal enters the combustion chamber, or	See ’114 1c
29d	the combustion chamber comprises added Br_2, HBr, bromide compound, or a combination thereof, or	See ’114 1c
29e	a combination thereof; and	See ’114 1c
29f	collecting mercury in the mercury-containing gas with a sorbent added to the mercury-containing gas, the sorbent comprising activated carbon.	See ’114 1e
30a	A method of separating mercury from a mercury-containing gas, the method comprising:	See ’114 1a
30b	combusting coal in a combustion chamber, to provide the mercury-containing gas, wherein the mercury-containing gas comprises a halogen or halide promoter comprising HBr, Br^-, or a combination thereof, wherein	See ’114 1b, 1c

No.	’517 Claim Element	Accused Conduct
30c	the coal comprises added Br_2, HBr, bromide compound, or a combination thereof, added to the coal before the coal enters the combustion chamber, or	See ’114 1c
30d	the combustion chamber comprises added Br_2, HBr, bromide compound, or a combination thereof, or	See ’114 1c
30e	a combination thereof;	See ’114 1c
30f	collecting mercury in the mercury-containing gas with a sorbent added to the mercury-containing gas, the sorbent comprising activated carbon;	See ’114 1e
30g	separating the sorbent contacted with the mercury from the mercury-containing gas;	See ’114 1f
30h	measuring the mercury content of the mercury-containing gas; and	See ’114 1g
30i	modifying, in response to the measured mercury content of the mercury-containing gas,	See ’114 1h
30j	an injection rate of injecting the sorbent into the mercury-containing gas,	See ’114 1h
30k	an amount of the Br_2, HBr, bromide compound, or a combination thereof, added to the coal or the combustion chamber, or	See ’114 1h
30l	a combination thereof.	See ’114 1h

’430 Claim Chart

No.	’430 Claim Element	Accused Conduct
1a	A method of separating mercury from a mercury-containing gas, the method comprising:	See ’114 1a
1b	combusting coal in a combustion chamber, to provide the mercury-containing gas, wherein	See ’114 1b
1c	the coal comprises an additive comprising Br_2, HBr, a bromide compound, or a combination thereof, wherein the additive is added to the coal before the coal enters the combustion chamber, or	See ’114 1c
1d	the combustion chamber comprises an additive comprising Br_2, HBr, a bromide compound, or a combination thereof or	See ’114 1c
1e	a combination thereof;	See ’114 1c
1f	injecting a sorbent comprising activated carbon into the mercury-containing gas downstream of the combustion chamber;	See ’114 1d
1g	contacting mercury in the mercury-containing gas with the sorbent; and	See ’114 1e
1h	separating the sorbent contacted with the mercury from the mercury-containing gas.	See ’114 1f

No.	’430 Claim Element	Accused Conduct
2	The method of claim 1, wherein the coal comprises the additive comprising the Br_2, HBr, the bromide compound, or a combination thereof, wherein the additive is added to the coal before the coal enters the combustion chamber.	See ’114 claim 6
3	The method of claim 1, wherein the combustion chamber comprises the additive comprising the Br_2, HBr, the bromide compound, or a combination thereof.	See ’114 1c
4	The method of claim 1, wherein the coal is combusted in the combustion chamber at a coal-combustion facility, wherein the additive comprising the Br_2, HBr, bromide compound, or combination thereof, is added to the coal before the coal enters the combustion chamber, wherein the addition of the additive comprising the Br_2, HBr, bromide compound, or combination thereof, to the coal is performed at the coal-combustion facility.	See ’114 claim 6
6	The method of claim 1, wherein the combustion chamber is an electric utility coal combustion chamber.	Each of the Accused Coal Plants contain electric utility coal combustion chambers.
7	The method of claim 1, wherein the combustion chamber is a coal combustion furnace.	See ’114 claim 1b
8	The method of claim 1, wherein the coal comprises a subbituminous coal.	See ’225 claim 25
10a	The method of claim 1, further comprising	See ’114 1g

No.	’430 Claim Element	Accused Conduct
10b	measuring the mercury content of the mercury-containing gas; and	See ’114 1h
10c	modifying, in response to the measured mercury content of the mercury-containing gas,	See ’114 1h
10d	an injection rate of injecting the sorbent into the mercury-containing gas,	See ’114 1h
10e	an amount of the Br_2, HBr, the bromide compound, or a combination thereof, added to the coal or the combustion chamber, or	See ’114 1h
10f	a combination thereof.	See ’114 1h
11	The method of claim 10, wherein the measuring of the mercury content comprises continuous measurement.	See ’225 claim 24
12a	The method of claim 1, further comprising:	See ’114 1h
12b	modifying, in response to a measured mercury content,	See ’114 1h
12c	an injection rate of injecting the sorbent into the mercury-containing gas,	See ’114 1h
12d	an amount of the Br_2, HBr, the bromide compound, or a combination thereof, added to the coal or the combustion chamber, or	See ’114 1h
12e	a combination thereof.	See ’114 1h

No.	’430 Claim Element	Accused Conduct
13	The method of claim 1, wherein the mercury-containing gas comprises about 1 g to about 30 g of the element bromine per 100 g of the sorbent.	See ’114 claim 4
14	The method of claim 1, wherein the sorbent contacted with the mercury comprises the element bromine and mercury.	See ’114 1f
15	The method of claim 1, comprising removing greater than 70 wt % of the mercury in the mercury-containing gas.	See ’114 claim 2
16	The method of claim 1, comprising removing greater than 70 wt % of the mercury in the mercury-containing gas with the sorbent.	See ’114 claim 3
17	The method of claim 1, wherein the sorbent in the mercury-containing gas comprises about 1 g to about 30 g of the added Br_2, HBr, the bromide compound, or a combination thereof, per 100 g of the sorbent.	See ’114 claim 4
18	The method of claim 1, wherein the Br_2, HBr, or the bromide compound is contacted with the sorbent in vapor form, gaseous form, liquid form, or in an organic solvent.	See ’114 claim 7
19	The method of claim 1, wherein the activated carbon comprises powdered activated carbon, granular activated carbon, or a combination thereof.	See ’114 claim 12
21	The method of claim 1, wherein the sorbent injected into the mercury-containing gas is free of contact with a halogen or halide promoter prior to injection of the sorbent into the mercury-containing gas.	See ’114 claim 13

No.	’430 Claim Element	Accused Conduct
22	The method of claim 1, wherein the combustion chamber comprises a boiler.	See ’114 claim 1
23	The method of claim 1, wherein the mercury-containing gas is a flue gas.	See ’114 claim 1
24	The method of claim 1, wherein the injection of the sorbent into the mercury-containing gas occurs upstream of a particulate separator, a scrubber, or a combination thereof.	See ’114 claim 18
25	The method of claim 24, wherein the particulate separator comprises a baghouse, an electrostatic precipitator, a fabric filter, or a combination thereof.	See ’114 claim 18
28a	A method of separating mercury from a mercury-containing as, the method comprising:	See ’114 1a
28b	combusting coal in a combustion chamber, to provide the mercury-containing gas, wherein the mercury-containing gas comprises a halogen or halide promoter comprising HBr, Br^-, or a combination thereof, wherein	See ’114 1b, 1c
28c	the coal comprises an additive comprising Br_2, HBr, a bromide compound, or a combination thereof, wherein the additive is added to the coal before the coal enters the combustion chamber, or	See ’114 1c
28d	the combustion chamber comprises an additive comprising Br_2, HBr, a bromide compound, or a combination thereof, or	See ’114 1c

No.	’430 Claim Element	Accused Conduct
28e	a combination thereof,	See ’114 1c
28f	injecting a sorbent comprising activated carbon into the mercury-containing gas downstream of the combustion chamber;	See ’114 1d
28g	contacting mercury in the mercury-containing gas with the sorbent; and	See ’114 1e
28h	separating the sorbent contacted with the mercury from the mercury-containing gas.	See ’114 1f
29a	A method of separating mercury from a mercury-containing gas, the method comprising:	See ’114 1a
29b	combusting coal in a combustion chamber, to provide the mercury-containing gas, wherein the mercury-containing gas comprises a halogen or halide promoter comprising HBr, Br^-, or a combination thereof, wherein	See ’114 1b, 1c
29c	the coal comprises an additive comprising Br_2, HBr, a bromide compound, or a combination thereof, wherein the additive is added to the coal before the coal enters the combustion chamber, or	See ’114 1c
29d	the combustion chamber comprises an additive comprising Br_2, HBr, a bromide compound, or a combination thereof, or	See ’114 1c
29e	a combination thereof;	See ’114 1c

No.	’430 Claim Element	Accused Conduct
29f	injecting a sorbent comprising activated carbon into the mercury-containing gas downstream of the combustion chamber such that the activated carbon reacts with the halogen or halide promoter in the mercury-containing gas to form a promoted sorbent;	See ’114 1d
29g	contacting mercury in the mercury-containing gas with the promoted sorbent;	See ’114 1e
29h	separating the promoted sorbent contacted with the mercury from the mercury-containing gas;	See ’114 1f
29i	measuring the mercury content of the mercury-containing gas; and	See ’114 1g
29j	modifying, in response to the measured mercury content,	See ’114 1h
29k	an injection rate of injecting the sorbent into the mercury-containing gas,	See ’114 1h
29l	an amount of the Br_2, HBr, the bromide compound, or a combination thereof, added to the coal or the combustion chamber, or	See ’114 1h
29m	a combination thereof.	See ’114 1h

’370 Claim Chart

No.	’370 Claim Element	Accused Conduct
1a	A method for separating mercury from a mercury-containing gas, the method comprising:	See ’114 1a
1b	combusting a mixture of coal and an additive in a combustion chamber, to form the mercury-containing gas, wherein the additive is chosen from halides, halogens, salts thereof, and combinations thereof;	See ’114 1b, 1c.
1c	adding a particulate sorbent material comprising activated carbon into the mercury-containing gas, wherein a weight ratio of the additive added to the coal, added to the combustion chamber, or a combination thereof, to an amount of the sorbent material added to the mercury-containing gas is from about 1:100 to about 30:100;	See ’114 Claim 4.
1d	contacting mercury in the mercury-containing gas with the sorbent material, to form a mercury-sorbent; and	See ’114 1e.
1e	separating the mercury-sorbent from the mercury-containing gas.	See ’114 1f
2	The method of claim 1, further comprising adding the additive to the coal before combusting the coal.	See ’114 1c
3	The method of claim 2, wherein the additive mixed with the coal is in a liquid.	See ’114 1c

No.	’370 Claim Element	Accused Conduct
4	The method of claim 3, wherein the liquid is a hydrocarbon, supercritical carbon dioxide, water, salt solution, or a combination thereof.	See ’114 1c.
5	The method of claim 1, wherein carbocations in the activated carbon of the mercury-sorbent accept electrons from mercury atoms of the mercury-sorbent.	The activated carbon contains graphene sheets having carbene species edge sites which react with the bromine containing promoter to form a carbocation paired with a halide anion in the promoted halogenated sorbent for oxidation of the mercury. *See* ’114 fig. 2; ’370 patent, col. 14:45–59.
6	The method of claim 1, wherein the additive is substantially in vapor form in the mercury-containing gas.	See ’114 claim 7
8	The method of claim 1, wherein the additive is chosen from Br_2, HBr, sodium bromide, calcium bromide, and a combination thereof.	See ’114 1c
10	The method of claim 1, wherein the additive is chosen from I_2, HI, sodium iodide, calcium iodide, potassium iodide, and combinations thereof.	Various of the Accused Coal Plants have used I_2, HI, sodium iodide, calcium iodide, potassium iodide, and/or combinations thereof as additives. See Attachment A; See ’218 1c
11	The method of claim 1, wherein the activated carbon is chosen from powdered activated carbon, granular activated carbon, carbon black, carbon fiber, aerogel carbon, pyrolysis char, and combinations thereof.	See ’114 claim 12

No.	’370 Claim Element	Accused Conduct
12	The method of claim 1, further comprising adding an alkaline component to the mercury-containing gas, the alkaline component chosen from alkali elements, alkaline earth elements, alkali salts, alkaline earth salts, and combinations thereof.	See ’225 claim 9.

’218 Claim Chart

No.	’218 Claim Element	Accused Conduct
1a	A method of separating mercury from a mercury-containing gas, the method comprising:	See ’114 1a.
1b	combusting coal in a combustion chamber, to provide the mercury-containing gas, wherein	See ’114 1b
1c	the coal comprises added HI, an iodide salt, or a combination thereof, added to the coal before the coal enters the combustion chamber, or the combustion chamber comprises added HI, an iodide salt, or a combination thereof, or a combination thereof;	The coal comprises added HI, an iodide salt, or a combination thereof, added to the coal upstream of the combustion chamber, or the combustion chamber comprises added HI, an iodide salt, or a combination thereof, or a combination thereof. Various of the Accused Coal Plants (including at least the George Neal North, Louisa, George Neal South, Jim Bridger, and Sioux power plants) have combusted coal that was treated with HI, sodium iodide, calcium iodide, potassium iodide, and/or combinations thereof as additives. See Attachment A. Sodium iodide, calcium iodide, and potassium iodide are iodide salts. Thus, an iodide salt (or salts) is added to the coal before the coal enters the combustion chamber. In addition the chamber comprises

No.	’218 Claim Element	Accused Conduct
		added HI, an iodide salt, or a combination thereof, because one or more of these are produced during combustion from the iodine that was added to the coal.
1d	injecting a sorbent comprising activated carbon into the mercury-containing gas downstream of the combustion chamber, wherein a weight ratio of the HI, iodide salt, or the combination thereof added to the coal, added to the combustion chamber, or a combination thereof, to an amount of the sorbent injected into the mercury-containing gas is from about 1:100 to about 30:100;	The Accused Coal Plants inject activated carbon sorbent such that the sorbent in the mercury-containing gas comprises about 1 g to about 30 g of the iodine- or iodide-containing additive per 100 g of the sorbent material. Based on ME2C’s experience in supplying and consulting on mercury capture for coal plants, the accused coal plants must use a ratio within this range because using too little iodine relative to the activated carbon would be ineffective, and using too much iodine relative to the activated carbon would be costly without providing a meaningful benefit in mercury capture.
1e	contacting mercury in the mercury-containing gas with the sorbent; and	See ’114 1e
1f	separating the sorbent contacted with the mercury from the mercury-containing gas.	See ’114 1f

No.	’218 Claim Element	Accused Conduct
2	The method of claim 1, wherein the coal comprises the added HI, the iodide salt, or a combination thereof, added to the coal before the coal enters the combustion chamber.	See 1c
3	The method of claim 1, wherein the combustion chamber comprises the added HI, the iodide salt, or a combination thereof.	See 1c
4	The method of claim 1, wherein the coal is combusted in the combustion chamber at a coal-combustion facility, wherein the HI, iodide salt, or combination thereof, is added to the coal before the coal enters the combustion chamber, wherein the addition of the HI, iodide salt, or combination thereof, to the coal is performed at the coal-combustion facility.	See 1c
6	The method of claim 1, wherein the combustion chamber is a coal combustion chamber that is used to produce electricity.	Each of the Accused Coal Plants contain electric utility coal combustion chambers.
7	The method of claim 1, wherein the combustion chamber is a coal combustion furnace.	See ’114 claim 1b
8	The method of claim 1, wherein the coal comprises a subbituminous coal.	See ’225 claim 25
10a	The method of claim 1, further comprising	See 1a-f
10b	measuring the mercury content of the mercury-containing gas; and	See ’114 1g

No.	’218 Claim Element	Accused Conduct
10c	modifying, in response to the measured mercury content of the mercury-containing gas, an injection rate of injecting the sorbent into the mercury-containing gas, an amount of the HI, the iodide salt, or a combination thereof, added to the coal or the combustion chamber, or a combination thereof	See ’114 1h
12a	The method of claim 1, further comprising	See 1a-f
12b	modifying, in response to a measured mercury content, an injection rate of injecting the sorbent into the mercury-containing gas, an amount of the HI, the iodide salt, or a combination thereof, added to the coal or the combustion chamber, or a combination thereof.	See ’114 1h
14	The method of claim 1, comprising removing greater than 70 wt % of the mercury in the mercury-containing gas.	See 1a-f; ’114 claim 2
15	The method of claim 1, comprising removing greater than 70 wt % of the mercury in the mercury-containing gas with the sorbent	See 1a-f; ’114 claims 2, 3
16	The method of claim 1, wherein the combination of the contacting of the mercury in the mercury-containing gas with the sorbent and the separating of	See ’114 1e, 1f

No.	’218 Claim Element	Accused Conduct
	the sorbent contacted with the mercury from the mercury-containing gas decreases the amount of elemental mercury in the mercury-containing gas.	
18	The method of claim 1, wherein the sorbent injected into the mercury-containing gas is free of contact with a halogen or halide promoter prior to injection of the sorbent into the mercury-containing gas.	See ’114 claim 13
19	The method of claim 1, further comprising injecting an additive comprising a compound comprising Ca, Na, or a combination thereof, into the mercury-containing gas downstream of the combustion chamber.	The Accused Coal Plants inject an additive comprising a compound comprising Ca, Na, or a combination thereof, into the mercury-containing gas downstream of the combustion chamber. According to publicly available EIA data, in connection with their flue gas desulfurization system, the Accused Coal Plants all report injecting a materials included in sorbent codes LI (Lime / slacked lime / hydrated lime) (which are compounds comprising Ca), LS (Limestone / dolomitic limestone / calcium carbonate) (which are compounds comprising Ca), and/or SA (Soda ash / Sodium bicarbonate / Sodium carbonate / Sodium formate / Soda liquid) (which are compounds comprising Na). *See, e.g.*, ME2C_SDIA-00019455.

No.	’218 Claim Element	Accused Conduct
20	The method of claim 1, wherein the mercury-containing gas is a flue gas.	See ’114 claim 16
21	The method of claim 1, wherein the injection of the sorbent into the mercury-containing gas occurs upstream of a particulate separator or a scrubber.	See ’114 claims 1, 18
22	The method of claim 21, wherein the particulate separator is an electrostatic precipitator, a baghouse, a fabric filter, or a combination thereof.	See ’114 claim 18
23	The method of claim 1, wherein the coal comprises added halide sorbent enhancement additive that comprises the HI, iodide salt, or combination thereof.	See 1c
24	The method of claim 1, wherein the coal and/or the combustion chamber comprises the iodide salt.	See 1c
25a	A method for reducing mercury in a mercury containing gas, the method comprising:	See 1a
25b	combusting coal in a combustion chamber, the coal comprising an additive comprising added HI, an iodide salt, or a combination thereof, to form the mercury-containing gas;	See 1b, 1c.
25c	collecting mercury in the mercury-containing gas with an injected sorbent comprising activated carbon, wherein a weight ratio of the HI, iodide salt, or the combination thereof added to the coal, added to the combustion chamber,	See 1c; ’114 1d, 1e

No.	’218 Claim Element	Accused Conduct
	or a combination thereof, to an amount of the sorbent injected into the mercury-containing gas is from about 1:100 to about 30:100.	
26a	A method of separating mercury from a mercury-containing gas, the method comprising:	See ’114 1a.
26b	combusting coal in a combustion chamber, to provide the mercury-containing gas, wherein	See ’114 1b.
26c	the coal comprises added HI, an iodide salt, or a combination thereof, added to the coal before the coal enters the combustion chamber, or the combustion chamber comprises added HI, an iodide salt, or a combination thereof, or a combination thereof;	See 1c
26d	injecting a sorbent comprising activated carbon into the mercury-containing gas downstream of the combustion chamber such that the activated carbon reacts with the halogen or halide promoter in the mercury-containing gas to form a promoted sorbent, wherein a weight ratio of the HI, iodide salt, or the combination thereof added to the coal, added to the combustion chamber, or a combination thereof, to an amount of the sorbent injected into the mercury-containing gas is from about 1:100 to about 30:100;	See 1d
26e	contacting mercury in the mercury-containing gas with the promoted sorbent;	See 1e

No.	’218 Claim Element	Accused Conduct
26f	separating the promoted sorbent contacted with the mercury from the mercury-containing gas;	See 1f
26g	measuring the mercury content of the mercury-containing gas; and	See 10b
26h	modifying, in response to the measured mercury content of the mercury-containing gas,	See 10c
26i	an injection rate of injecting the sorbent into the mercury-containing gas, an amount of the HI, the iodide salt, or a combination thereof, added to the coal or the combustion chamber, or a combination thereof.	See 10c