

UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

CIV. No. 1:19-cv-01334-CJB

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MIDWEST ENERGY EMISSIONS CORP.

and MES INC.,

Plaintiffs,

v.

ARTHUR J. GALLAGHER & CO., ET AL.,

Defendants.

- - - - -x

August 26, 2022

9:34 a.m.

DEPOSITION of EDWIN OLSON, Ph.D., in
the above-entitled action, located at
Country Inn & Suites in Grand Forest,
North Dakota, was taken before Dawn
Matera, a Certified Shorthand Reporter
and Notary Public of the State of New
York.

* * *

Page 2 1 APPEARANCES: 2 CALDWELL CASSADY & CURRY 3 Attorneys for Plaintiffs 4 2121 N Pearl Street 5 Suite 1200 6 Dallas, Texas 75201 7 BY: ADRIENNE DELLINGER, ESQ. 8 adellinger@caldwellcc.com 9 GIBSON DUNN & CRUTCHER LLP 10 Attorneys for Defendants 11 1801 California Street 12 Suite 4200 13 Denver, Colorado 80202 14 BY: DAVID GLANDORF, ESQ. 15 dglandorf@gibsondunn.com 16 BY: WENDY C. CAI, ESQ. 17 wcai@gibsondunn.com 18 200 Park Avenue 47th Floor 19 New York New York 10166 20 BRADLEY ARANT BOULT CUMMINGS LLP 21 Attorneys for CERT Defendants 22 1819 5th Ave N 23 One Federal Place 24 Suite 200 25 Birmingham Alabama 35203 BY: BEN C. WILSON, ESQ. bwilson@bradley.com Also Present: Jeffrey D. Anders, Videographer James Budkins, Concierge * * *	Page 4 1 me is Wendy Cai. 2 MR. WILSON: Ben Wilson, here 3 for the CERT defendants. 4 MS. DELLINGER: Adrienne 5 Dellinger, I am here on behalf of 6 Dr. Olson. 7 EDWIN OLSON, P h. D., 8 the Witness herein, having first 9 been duly sworn by the Notary 10 Public, was examined and 11 testified as follows: 12 EXAMINATION 13 BY MR. GLANDORF: 14 Q. Good morning, Dr. Olson. 15 A. Good morning. 16 Q. I am going to start with a few 17 introductory questions, if that's okay 18 with you. 19 A. Yeah. 20 Q. Could you once more state and 21 spell your full name for the record, 22 please? 23 A. Edwin Olson. You want me to 24 spell it? 25 Q. Yes, please.
Page 3 1 THE VIDEOGRAPHER: We are now on 2 the record. This is the video 3 recording of the deposition of 4 Dr. Edwin Olson taken by the 5 defendants' attorneys in the matter of 6 Midwest Energy Emissions Corporation 7 and MES Incorporated versus Arthur J. 8 Gallagher & Company in the United 9 States District Court for the District 10 of Delaware. The Civil File Number is 11 119-CV-01334. 12 We are located at the Country 13 Inn & Suites in Grand Forest, North 14 Dakota. Today's date is August 26th, 15 2022. The time is 8:34 a.m. 16 The court reporter today is Dawn 17 Matera. My name is Jeffrey D. Anders, 18 I am the videographer here 19 representing Veritext. 20 Will counsel for the respective 21 parties please identify yourselves, 22 starting with the noticing attorney. 23 MR. GLANDORF: My name is David 24 Glandorf. I am here for Gibson Dunn, 25 on behalf of the defendants, and with	Page 5 1 A. E-D-W-I-N, O-L-S-O-N. 2 Q. Thank you. Yes, that's a 3 little bit of a convention that we 4 traditionally do here. 5 And where is your current 6 address? 7 A. It's in Grand Forks North 8 Dakota. 9 Q. Can you give us the address? 10 A. Yes. 223 Circle Hills Drive, 11 Grand Forks, North Dakota, 58201. 12 Q. Excellent. Have you ever been 13 deposed previously, Dr. Olson? 14 A. No. 15 Q. Okay. Well, I am going to lay 16 out a little bit of the expectations and 17 feel free to ask me any questions about 18 these. 19 As I mentioned before, I 20 represent the defendants in this lawsuit 21 and so I am here to ask questions of you. 22 You understand that? 23 A. Yes. 24 Q. This is our opportunity as 25 defendants to ask you questions. Your

2 (Pages 2 - 5)

Page 6 1 attorney may object at some points, but 2 unless your attorney instructs you not to 3 answer, you should go ahead and answer 4 the question anyway. 5 Do you understand that? 6 A. Yes. 7 Q. Again, your attorney is very 8 capable. She will instruct you not to 9 answer if it's a question that should not 10 be answered. 11 Do you understand that? 12 A. Yes. 13 Q. The court reporter will record 14 my questions and your answers and the 15 videographer will film you. Since the 16 court reporter only records words, it is 17 important for you to answer in words 18 rather than gestures or nods. Is that 19 okay? 20 A. Yes. 21 Q. And I will do my best to let 22 you finish answering a question. And I 23 ask that you let me finish asking a 24 question before you provide your answer; 25 is that okay?	Page 8 1 external factor that would prevent you 2 from answering truthfully today; is that 3 correct? 4 A. No. 5 Q. We will be taking periodic 6 breaks. If at any time you feel like you 7 need a break, you can just say so to me; 8 if that's okay. 9 Again, I know this is a minor 10 question, but you do want to answer 11 either yes or no verbally. 12 A. Yes. 13 Q. Do you plan to offer testimony 14 at trial? 15 A. I don't understand your 16 question. 17 Q. Sure. You understand we have a 18 litigation that is going on here that may 19 proceed to an in-person trial. Are you 20 planning to offer testimony at that 21 trial? 22 A. No. 23 Q. Are you being paid for your 24 deposition today? 25 A. No.
Page 7 1 A. Yes. 2 Q. It can be easy in this format 3 to speak over one another, but we will 4 try to avoid that. 5 If at any time you do not 6 understand a question, please ask and I 7 will do my best my clarify. Is that 8 okay? 9 A. Yes. 10 Q. You are under oath today. Do 11 you understand that? 12 A. Yes. 13 Q. And so you are obligated to 14 provide true and accurate and complete 15 answers to the best of your ability. 16 Do you understand that? 17 A. Yes. 18 Q. Is there any reason why you 19 would not be able to provide truthful and 20 accurate answers today? 21 A. No. 22 Q. And just so, you know, some of 23 the things we ask, generally, you're not 24 on any medications or suffering from any 25 kind of illness or any kind of other	Page 9 1 Q. Are you set to receive any type 2 of payment based on the outcome of this 3 case? 4 A. No. 5 Q. If there is a settlement or an 6 award in this case, do you expect to get 7 any portion of that? 8 A. No. 9 Q. To start things off, I would 10 like to hear from you a little bit about 11 your background. We will march through a 12 little bit of your educational employment 13 background. So let me start just by 14 asking you where you went to college and 15 what did you study? 16 A. Yes. I went to undergraduate 17 college at St. Olaf College, Northfield, 18 Minnesota. I got a bachelor's of arts 19 degree in 1959. Then subsequently I went 20 to graduate school at the California 21 Institute of Technology, Caltech. And I 22 received a Ph.D. in chemistry and 23 physics, and that was about 1963 -- 1963. 24 Q. And what was your major or your 25 undergraduate degree?

3 (Pages 6 - 9)

Page 10 1 A. Chemistry and physics. 2 Q. For your Caltech Ph.D., what 3 was the subject of your thesis? 4 A. It was in the general field of 5 organic chemistry and more specifically 6 it had to do with natural products and 7 actually three different types of topics 8 were included in my thesis. 9 Q. Could you just explain at a 10 high level what those three topics were? 11 A. Okay. Sure. The first topic 12 was to determine the chemical structure 13 of a pigment that was produced by a 14 bacterin. 15 The second project was to 16 discover a way to take apart a stearyl 17 molecule, a stearyl being like a plant 18 steroid to open up. It typically has a 19 four or five-ring structures. So the 20 problem was to find a way to open up one 21 of the rings of the structure, so that it 22 could be subsequently analyzed or 23 converted into something else. 24 The third portion of my work 25 was concerned with a biosynthesis of	Page 12 1 A. I went to Idaho State 2 University, as assistant professor of 3 chemistry. 4 Q. How long were you at Idaho 5 State? 6 A. Four years. 7 Q. And were you teaching organic 8 chemistry? 9 A. I taught organic chemistry, 10 yes. 11 Q. Did you teach general chemistry 12 as well? 13 A. Yes. 14 Q. Inorganic chemistry? 15 A. No. 16 Q. Physical chemistry? 17 A. No. 18 Q. Did you have a research group 19 at Idaho State? 20 A. Yes. 21 Q. And what, at a high level, what 22 types of topics was, what were the 23 subjects of that research? 24 A. Well, there were, over the four 25 years, there were maybe a couple of
Page 11 1 strychnine. So what that means I was 2 trying to learn, trying to understand all 3 of the strychnos nux-vomica plant 4 produces the alkaloid molecule 5 strychnine. What were the precursors of 6 it. What did it use to make the 7 molecule. And I would put them together 8 to form a structure. 9 Q. And where did you begin 10 employment after graduating? 11 A. Oh, after I graduated with my 12 Ph.D.? 13 Q. Yes. 14 A. I went to UCLA to the 15 department of biological chemistry and 16 worked in the institute for radiological 17 chemistry and I studied fatty acid 18 chemistry. 19 Q. Was that a post-doc? 20 A. Yes, post-doc. Yes. 21 Q. And how long were you at that 22 position? 23 A. One year. 24 Q. And where did you go after 25 that?	Page 13 1 different areas. One of the areas was to 2 find a way to synthesize a substituted 3 amino acid that might be useful as a 4 cancer drug. 5 Q. Okay. Is there another topic 6 that you researched as well or was that 7 the primary one? 8 A. I worked on maybe one or two 9 other things. I did do some work with 10 fatty acid chemistry and some nitrogen 11 heterocyclic chemistry. 12 Q. And you understand that the 13 litigation we are here for today relates 14 to mercury capture from power plants, 15 correct? 16 A. Yes. 17 Q. Was any of the work that you 18 did during your post-doc related to that 19 topic? 20 A. No. 21 Q. And where did you go after that 22 post-doc position? 23 A. Well, I just told you after my 24 post-doc position I went to Idaho State 25 University.

4 (Pages 10 - 13)

Page 14 1 Q. I apologize, I am sorry, you're 2 right. Where did you go after Idaho 3 State? 4 A. I went to South Dakota State 5 University. 6 Q. And what was your position 7 there? 8 A. It was assistant professor, 9 associate professor and a full professor 10 of chemistry. 11 Q. Did you teach the same types of 12 classes that you taught at Idaho State? 13 A. Yes -- 14 Q. Okay. 15 A. -- plus additional graduate 16 classes. 17 Q. And what were the topics of 18 those graduate classes? 19 A. They were in inorganic 20 chemistry. One was polymer chemistry. 21 One was heterocyclic chemistry. 22 Biochemistry. 23 Q. And did you have a research 24 group at that university? 25 A. Yes.	Page 16 1 A. I went to Grand Forks North 2 Dakota and started working at the United 3 States Bureau of Mines laboratory in 4 1980. 5 MR. GLANDORF: Let's go ahead, 6 actually and take a moment and 7 introduce our first exhibit. It will 8 be Exhibit 1 here. 9 (Olson Exhibit 1, a curriculum 10 vitae of Dr. Edwin Olson prepared in 11 2012 was so marked for identification, 12 as of this date.) 13 Q. Dr. Olson and Adrienne, are you 14 able to access the Marked Exhibits 15 folder? 16 MS. DELLINGER: Yes. 17 Q. Dr. Olson, you should have the 18 ability to scroll up and down and view 19 these documents. 20 Dr. Olson, I will point out, in 21 the lower right corner of the exhibit, do 22 you see first of all what's a virtual 23 sticker that says Exhibit 0001; do you 24 see that? 25 A. Yes.
Page 15 1 Q. And what topics was your 2 research group studying? 3 A. Generally, synthesis of 4 potential cancer drugs, amino acid type 5 molecules. 6 Q. Okay. 7 A. Most of it was in that area. 8 Some of it was maybe a little bit more 9 organic chemical manipulations, to try to 10 make a certain type of molecule. So it 11 was just conducting a series of reactions 12 that were designed to make a certain type 13 of molecule. 14 Q. So most of the focus was on 15 organic chemistry and biochemistry; is 16 that fair? 17 A. That's correct. 18 Q. And what year did you leave San 19 Diego State -- sorry, scratch that. Let 20 me try that again. 21 What year did you leave South 22 Dakota State? 23 A. 1980. 24 Q. And where did you go at that 25 time?	Page 17

5 (Pages 14 - 17)

Page 54 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]	Page 56 1 Q. And then you mentioned that you 2 had -- I am sorry, had you met Constance 3 Senior? 4 A. Oh, yes, yes. 5 Q. Do you find Ms. Senior to be a 6 reliable scientist? 7 A. Dr. Senior is a reliable 8 scientist, yes. 9 Q. Well, I want to introduce this 10 document -- just to let you know, I want 11 to introduce this document just to make 12 sure we are on the same page, you and I, 13 on some of the terminology here. 14 A. Okay. 15 Q. If you disagree with any of the 16 terminology, let's just make sure we are 17 on the same page. So let's go to the 18 page ending in 40336, that's that number 19 stamped in the bottom right. Let me know 20 when you have this page. 21 A. Yes. 22 Q. I would direct you to read, you 23 can read to yourself here, the paragraph 24 at the top that starts with "Much 25 fundamental work"?
Page 55 1 A. All right. 2 Q. And do you see this is titled, 3 "Boiler Mercury Control: A Holistic 4 Approach"? 5 A. I do. 6 Q. Do you recognize the authors of 7 this paper, these names? 8 A. Two of them. 9 Q. Which one do you recognize? 10 A. Constance Senior and Sharon 11 Sjostrom. 12 Q. And have you interacted with 13 Ms. Sjostrom? 14 A. What do you mean by interacted? 15 Q. Have you met her? 16 A. Yes, I've met Sharon Sjostrom. 17 Q. Have you collaborated on any 18 research with her? 19 A. Yes. 20 Q. Do you find her to be a 21 trustworthy scientist? 22 A. Sorry, can you repeat that? 23 Q. Do you find her to be a 24 trustworthy scientist? 25 A. Yes, as far as I know.	Page 57 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]

15 (Pages 54 - 57)

Page 66 1 1; is that fair? 2 A. Yes. 3 Q. There is an element of Claim 1 4 that is referred to as the 5 bromine-containing promoter, correct? 6 A. Yes. 7 Q. In the example shown here in 8 Figure 2, what is the bromine-containing 9 promoter? 10 A. HBr. 11 Q. And also, is there an activated 12 carbon sorbent shown in Figure 2? 13 A. It's represented by the part of 14 the figure that says "carbon basic 15 zig-zag site." That would be part of the 16 activated carbon. 17 Q. I see. And again if we go back 18 to Claim 1 of the '147 patent, it refers 19 to a promoted brominated sorbent; do you 20 see that? 21 A. Sorry, I am on the wrong thing. 22 I have to go back to Exhibit 2? 23 Q. Yes. Let me point you to a 24 particular part of Claim 1 here, and then 25 we'll go back to the drawing and try to	Page 68 1 there needs to be a chemical reaction 2 between the HBr and the unpromoted 3 sorbent, which I marked as 2, to form the 4 promoted brominated sorbent, which I 5 marked as 3; do I have that right? 6 A. That's correct. 2 represents 7 the edge structure of the activated 8 carbon. 9 Q. What do you mean by "the edge 10 structure"? 11 A. Well, the structure of the 12 activated carbon, in this case, is a, 13 what's referred to as a graphene sheet or 14 ribbon where you have a lot of these 15 structures that are adjacent to each 16 other in a chicken-wire type arrangement. 17 And the edge of that ribbon or sheet, 18 part of the edge of it would look like 19 that. 20 Q. And this description of 21 activated carbon, was this something that 22 you yourself discovered? 23 A. No. 24 Q. It was known from other 25 researchers, correct?
Page 67 1 find that. 2 So if you look at claim 1(a) 3 and kind of the first clause in that 4 where it says "Promoting at least a 5 portion of a particulate sorbent material 6 comprising activated carbon, by 7 chemically reacting the sorbent material 8 with a bromine-containing promoter to 9 form a promoted brominated sorbent." 10 A. Yes. 11 Q. Okay. So let's go back now to 12 claim, to Figure 2, which is Exhibit 8. 13 A. All right. 14 Q. The bromine-containing promoter 15 here is HBr, correct? 16 A. Yes. 17 Q. And is what I marked as Figure 18 2, a representation of the unpromoted 19 sorbent? 20 A. Yes. 21 Q. And is what I marked as figure 22 3, a representation of a promoted 23 brominated sorbent? 24 A. Yes. 25 Q. So according to the claim,	Page 69 1 A. Yes. 2 Q. It was known from other 3 researchers at the time the provisional 4 was filed, which if you recall was a 5 August 2004? 6 A. Yes, and yes it would be known 7 because it was published several years 8 earlier. In fact, well known. 9 Q. And now what's going on, if we, 10 as we move from what I marked as number 3 11 to number 4 on Exhibit 8? 12 A. I am sorry, what is going on? 13 Q. Yes, what is the change from 14 step 3 to step 4 of Exhibit 8? 15 A. Yes. That represents the 16 oxidation of the mercury which forms new 17 bonds to the mercury, one to the carbon 18 and one to the bromine. 19 Q. And then what is happening from 20 step 4 to step 5, or species 4 to species 21 5 in Figure 2? 22 A. Well, what we know is that the 23 primary oxidant in the reaction of 24 mercury on the carbon surface, the 25 primary oxidant, the one that is actually

18 (Pages 66 - 69)

Page 78 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]	Page 80 1 Q. Let's go back to the claim 2 language. Let's go back to Claim 1. So 3 if you're in Exhibit 2 of Claim 1. 4 Yeah, let's go down to the 5 claim at the end. So go ahead and read 6 through Claim 1, and I will ask my 7 question now and I will ask it at the end 8 after reading it, if you prefer, as well. 9 Is it fair to say that Claim 1 10 covers a heterogeneous oxidation of 11 mercury by a bromine species, but not a 12 homogenous oxidation of mercury by a 13 bromine species? 14 MS. DELLINGER: I'll object 15 again. Calls for a legal conclusion. 16 You may answer. 17 A. The claim does not say it has 18 to be heterogeneous. 19 Q. It doesn't use that word. But 20 going by our understanding of those 21 terms, heterogeneous and homogenous, and 22 the pathway described here, I am going to 23 ask the question again: Is it fair to 24 say that Claim 1 covers a heterogeneous 25 oxidation of mercury by a bromine species
Page 79 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]	Page 81 1 but not a homogenous oxidation of mercury 2 by a bromine species? 3 MS. DELLINGER: Same objection. 4 A. I would say that it could, it 5 could involve a homogenous reaction that 6 we haven't thought about yet. 7 Q. So Claim 1 could cover the 8 homogenous oxidation of mercury by a 9 bromine species; is that your testimony? 10 A. Sure. 11 Q. There is an indication in here 12 that you formed a promoted brominated 13 sorbent by chemically reacting the 14 sorbent material with the 15 bromine-containing promoter; is that 16 right? 17 A. Yes, that would be a chemical 18 reaction, yeah. 19 Q. Is it possible that -- well, 20 let me pause here. Do you have an 21 understanding of what species may or may 22 not may qualify -- let me ask it again. 23 Do you have an understanding of 24 what bromine species would qualify as a 25 bromine-containing promoter?

21 (Pages 78 - 81)

Page 82 1 A. Well, I have a partial 2 understanding. 3 Q. Could HBr be a 4 bromine-containing promoter? 5 A. Yes. 6 Q. Could sodium bromide be a 7 bromine-containing promoter? 8 A. Not unless it is converted into 9 something else. 10 Q. Could calcium bromide be a 11 bromine-containing promoter? 12 A. Again, it would have to be 13 converted. 14 Q. Converted to something else? 15 A. Yes. 16 Q. Could Br₂ be a 17 bromine-containing promoter? 18 A. Yes. 19 Q. Could Br radical be a 20 bromine-containing promoter? 21 A. I don't know. 22 Q. Could Br⁻ be a 23 bromine-containing promoter? 24 A. Br⁻? 25 Q. Yes.	Page 84 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Page 83 1 A. No. Not unless it's converted 2 into something else. 3 Q. Could PBr₃ be a 4 bromine-containing promoter? 5 A. Yes. 6 Q. In fact, let me direct you to 7 claim 12; do you see claim 12? 8 A. Just a second. 9 Q. Actually, let me use a 10 different one. Let's look at claim 25, 11 if we could. 12 A. All right. 13 Q. Do you see that claim 25 refers 14 to a Group V or Group VI bromides? 15 A. Mmm-hmm. 16 Q. And PBr₃ is a Group V bromide, 17 I believe; is that right? 18 A. That's correct. 19 Q. So are Group V bromides 20 bromine-containing promoters? 21 A. Yes, or at least the one that 22 we tested was. 23 Q. And which one did you test? 24 A. PBr₃. 25 Q. Are Group VI bromides	Page 85 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

22 (Pages 82 - 85)

1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]	Page 92 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 Q. Claim 1 of the '114 patent 24 requires the addition of a bromine 25 species to the system, correct?
1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]	Page 93 1 A. No, not correct. 2 Q. Claim 1 doesn't require the 3 addition of a bromine species to the 4 system? 5 A. What it says is comprises a 6 halogen or halide promoter comprising HBr 7 Br- or a combination thereof. But I 8 don't think it's exclusive. 9 Q. Well, if the claim -- sorry, 10 let me start again here. 11 The claim requires the 12 introduction of Br₂, HBr or Br- at least 13 one of those if not a combination, 14 correct? 15 A. At least one of those, okay. 16 Q. The claim also requires 17 injection of activated carbon downstream 18 of a combustion chamber, correct? 19 A. Yes. 20 Q. And the purpose of injecting 21 that activated carbon is to act as a 22 sorbent; is that right? 23 A. To act as an oxidant and 24 sorbent for mercury. 25 Q. And it requires that that

24 (Pages 90 - 93)

Page 94 1 injection occur downstream of the 2 combustion chamber; is that right? 3 A. The sorbent is injected 4 downstream of the combustion chamber, 5 yes. 6 Q. Practically speaking, would you 7 ever inject an activated carbon sorbent 8 into the combustion chamber? 9 A. I don't think so unless you 10 were trying to dispose of it. 11 Q. What would happen if you 12 injected activated carbon into the 13 combustion chamber? 14 A. It would burn up most of it. 15 Q. And is that true also if you 16 were using pyrolysis char as the 17 activated carbon? 18 A. If you were using pyrolysis 19 char as what? 20 Q. Let me step back and ask the 21 question more generally. 22 If pyrolysis char was present 23 in the combustion chamber, what would 24 happen to that pyrolysis char? 25 A. It would be a fuel. So it	Page 96
Page 95 1 would burn. 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	Page 97 1 A. Yes. 2 Q. Is there any language in this 3 claim that requires the creation of a 4 promoted brominated sorbent? 5 A. It doesn't appear to use the 6 word "promoted." 7 Q. In fact, the step that 8 specifies that the mercury contacts the 9 sorbent simply says that there is contact 10 between mercury and the sorbent, it does 11 not refer to a promoted or a brominated 12 sorbent, correct? 13 A. It uses the term "activated 14 carbon" for the sorbent, it specifies 15 that the bromine is in the gas phase that 16 is coming in contact with the activated 17 carbon. It's there. It doesn't use the 18 word -- it doesn't use the word "promoted 19 activated carbon" being injected, because 20 that's not usually the case. In other 21 words, the promotion occurs during the 22 contact with a gas phase. So you 23 wouldn't call it -- at the point of 24 injection before it's injected, you 25 wouldn't call it promoted activated

25 (Pages 94 - 97)

Page 98 1 carbon. 2 Q. But the question is by the time 3 the mercury contacts it, is it required 4 to be promoted activated carbon? 5 A. It would be. It would be 6 promoted because they are both together 7 in the gas phase. 8 Q. And to be clear, the claim 9 language doesn't require that, correct? 10 MS. DELLINGER: Objection. 11 Calls for a legal conclusion. 12 You may answer. 13 A. Yeah, your question is 14 confusing to me. 15 Q. Well, I will go back and do it 16 again here. There is no language in the 17 claim that requires that the mercury come 18 in contact with a promoted or a 19 brominated sorbent? 20 A. The word "promoted" is not 21 used. However, its equivalent is 22 described in the claim. 23 Q. And that's based on your 24 experience of what will happen if you 25 have one of these bromine species in a	Page 100 1 injected in the combustion chamber, it 2 will form the promoted sorbent 3 downstream. 4 Q. Is that also true for the 5 addition of Br₂ in the combustion chamber 6 or upstream of the combustion chamber in 7 combination with activated carbon 8 injection? 9 A. Well, that's never done. 10 Q. Why is that never done? 11 A. Well, there are probably 12 several reasons. Br₂ is more corrosive. 13 It requires -- that would require, you 14 know, extra handling precautions, et 15 cetera. It's way more expensive to do it 16 that way. So that would absolutely 17 stupid. 18 Q. If one wanted to be stupid and 19 add Br₂ to the combustion chamber in 20 combination with the injection of 21 activated carbon downstream in a 22 coal-fired power plant, would you, 23 nevertheless, expect a promoted sorbent 24 to be formed? 25 A. I think so, but I'm not sure,
Page 99 1 gas stream with activated carbon; is that 2 right? 3 A. Yes. 4 Q. Your experience is that there 5 would be a promoted brominated sorbent 6 formed, correct? 7 A. Yes. 8 Q. Is that true for any coal-fired 9 power plant where you've added HBr to the 10 combustion chamber, and you inject 11 activated carbon downstream of the 12 combustion chamber? 13 A. I believe so. 14 Q. And is it true -- let me start 15 that again. 16 Is it your testimony that a 17 promoted brominated sorbent would be 18 formed anytime you add Br- to the 19 combustion chamber or upstream of the 20 combustion chamber in combination with 21 the injection of activated carbon 22 downstream? 23 A. Yes. If some composition of 24 Br- any metal salt, for example, of Br- 25 or a nonmetal compound of Br, if that's	Page 101

26 (Pages 98 - 101)

Page 114 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 Q. At the time the provisional 12 patent was filed, so in August of 2004, 13 was activated carbonate carbon sorbent 14 used for mercury capture? 15 A. Yes. Well, there were some, 16 there were some groups at least 17 interested in doing that. But I am not 18 certain about how much of it was actually 19 going on at, you know, in the industry in 20 real power plants. 21 Q. As of 2004, is it fair to say 22 that activated carbon was the most 23 heavily studied sorbent for the capture 24 of mercury? 25 A. Yes.	Page 116 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]
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30 (Pages 114 - 117)

126

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Page 128

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15 Q. Was the Br₂ ever introduced in
16 the system by applying it to the coal
17 before combustion in the examples of the
18 '147 patent?
19 A. Not that I know of.
20 Q. Was any bromine-containing
21 promoter introduced to the system by
22 applying it to the coal before combustion
23 in the examples of the '147 patent?
24 A. Well, not in the ones that we
25 looked at, anyway.

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Page 129

1 Q. Was any bromine-containing
2 promoter introduced in the system by
3 injecting it into the combustion zone in
4 the examples of the '147 patent?
5 A. Not in the examples that we
6 looked at previously.
7 Q. And there are no further
8 examples listed after Example 12,
9 correct?
10 A. There are none after 12.
11 [REDACTED]
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33 (Pages 126 - 129)

Page 134

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Page 135

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24 Q. As of August of 2004, is it
25 true that there were already a number of

Page 136

1 references describing the addition of
2 halides to the furnace?
3 A. I am aware of some other
4 references, but I don't know the dates.
5 Q. Can you give me an example of
6 one reference that you are thinking of?
7 A. There is a patent by Vosteen
8 which adds a halogen to the fuel, to the
9 furnace.
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Page 137

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35 (Pages 134 - 137)

Page 142 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]	Page 144 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 Q. Vosteen did disclose the
Page 143 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]	Page 145 1 addition of a bromine compound to the 2 furnace or the flue gas, correct? 3 A. Yes. 4 Q. Do you agree that the addition 5 of the bromine compound to the furnace or 6 the flue gas is an important part of your 7 invention? 8 A. Yes, but his addition of sulfur 9 is not. 10 Q. Your group at EERC was not the 11 first group to disclose the addition of a 12 bromine compound to the furnace or flue 13 gas, correct? 14 A. I am sorry, can you repeat 15 that? 16 Q. Your group at EERC was not the 17 first group to disclose the addition of a 18 bromine compound to the furnace or to the 19 flue gas, correct? 20 A. According to the dates on the 21 patent application, our disclosure came 22 after the publication of the Vosteen. 23 But the technologies are not identical. 24 They are quite different. 25 Q. You agree that EERC was not the

37 (Pages 142 - 145)

Page 146

1 first group to conceive of adding a
2 bromine compound to the furnace or to the
3 flue gas, correct?
4 A. We were not the first.
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Page 148

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Page 147

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Page 149

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38 (Pages 146 - 149)

Page 230

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Page 231

1 [REDACTED]
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3 Q. In a coal-fired power plant, if
4 calcium bromide is added to coal and put
5 into the furnace and activated carbon is
6 injected downstream of the furnace, would
7 in-flight promotion occur?
8 MR. GLANDORF: Same objection.
9 A. Yes.
10 Q. In that circumstance, how would
11 you define in-flight promotion?
12 MR. GLANDORF: Object to the
13 form of the question.
14 A. The in-flight then would refer
15 to a passage down a duct where the solid
16 sorbent had been injected at the
17 beginning of the duct or at some point in
18 the duct, and the gas flow of the duct
19 contained promoted material and -- I am
20 sorry, the gas flow in the duct contained
21 the halogenated or the halide promoter
22 for the carbon, that would be in-flight.
23 Q. And that would be in-flight
24 promotion?
25 A. Mmm-hmm.

Page 232

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Page 233

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59 (Pages 230 - 233)

Page 234 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]		Page 236 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 (Whereupon, at 4:48 P.M., the 20 deposition was concluded.) 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]	
Page 235 1 [REDACTED] 2 [REDACTED] 3 [REDACTED] 4 [REDACTED] 5 [REDACTED] 6 [REDACTED] 7 [REDACTED] 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 [REDACTED] 12 [REDACTED] 13 [REDACTED] 14 [REDACTED] 15 [REDACTED] 16 [REDACTED] 17 [REDACTED] 18 [REDACTED] 19 [REDACTED] 20 [REDACTED] 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]		Page 237 1 ACKNOWLEDGMENT OF DEPONENT 2 I have read the foregoing 3 transcript of my deposition and except 4 for any corrections or changes noted on 5 the errata sheet, I hereby subscribe to 6 the transcript as an accurate record of 7 the statements made by me. 8 [REDACTED] 9 [REDACTED] 10 [REDACTED] 11 EDWIN OLSON, Ph.D. 12 [REDACTED] 13 [REDACTED] 14 SUBSCRIBED AND SWORN before 15 and to me this ____ day 16 of _____, 20__. 17 [REDACTED] 18 [REDACTED] 19 NOTARY PUBLIC 20 My Commission Expires: 21 [REDACTED] 22 [REDACTED] 23 [REDACTED] 24 [REDACTED] 25 [REDACTED]	

60 (Pages 234 - 237)

Page 238

1	----- INDEX -----	
2	WITNESS EXAMINATION BY	PAGE
3	EDWIN OLSON, Mr. Glandorf	4
4	Ph.D., Mr. Wilson	190
5	Ms. Dellinger	232
6		
7	----- EXHIBITS -----	
8	OLSON	FOR ID.
9	Exhibit 1, a curriculum vitae of Dr.	16
10	Edwin Olson prepared in 2012	
11	Exhibit 2, document consisting of '147	37
12	Patent	
13	Exhibit 3, document consisting of '114	37
14	patent	
15	Exhibit 4, document consisting of '225	38
16	patent	
17	Exhibit 5, document consisting of '517	38
18	patent	
19	Exhibit 6, document consisting of '430	38
20	patent	
21	Exhibit 7, document bearing Bates stamp	54
22	ME2C-RC-00040334	
23	Exhibit 8, document consisting of an	64
24	annotated Figure 2 from the '147	
25	patent	

Page 240

1

2 CERTIFICATION

3

4 I, DAWN MATERA, a Notary Public for

5 and within the State of New York, do

6 hereby certify:

7 That the witness whose testimony as

8 herein set forth, was duly sworn by me;

9 and that the within transcript is a true

10 record of the testimony given by said

11 witness.

12 I further certify that I am not

13 related to any of the parties to this

14 action by blood or marriage, and that I

15 am in no way interested in the outcome of

16 this matter.

17 IN WITNESS WHEREOF, I have hereunto

18 set my hand this 29th day of August,

19 2022.

20

21 *Dawn Matera*

22 DAWN MATERA

23

24 * * *

25

Page 239

1	INDEX OF (Cont'd)	
2	----- EXHIBITS -----	
3	OLSON	FOR ID.
4	Exhibit 9, document bearing Bates stamp	131
5	ME2C-RC-00055866	
6	Exhibit 10, document bearing Bates stamp	139
7	ME2C-RC-00121392	
8	Exhibit 11, document bearing Bates stamp	146
9	ME2C-RC-00070797	
10	Exhibit 12, document bearing Bates stamp	151
11	ME2C-RC-00179930	
12	Exhibit 13, document bearing Bates stamp	154
13	ME2C-RC-00119710	
14	Exhibit 14, document bearing Bates stamp	154
15	ME2C-RC-00119712	
16	Exhibit 15, document consisting of the	166
17	'374 patent	194
18	Exhibit 16, document beginning with	
19	Bates stamp ME2C-RC-00055476	
20	Exhibit 17, document beginning with	196
21	Bates stamp ME2C-RC-00072299	
22	Exhibit 18, document beginning with	209
23	Bates stamp ME2C-0000355	
24	Exhibit 19, document beginning with	213
25	Bates stamp ME2C-0000327	

Page 241

1 ERRATA SHEET

2 VERITEXT LEGAL SOLUTIONS

3

4 MIDWEST ENERGY v. ARTHUR J. GALLAGHER & CO

5 DATE OF DEPOSITION: AUGUST 26, 2022

6 NAME OF WITNESS: EDWIN OLSON, P.D.

7

PAGE/LINE(S)	CHANGE	REASON
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20 EDWIN OLSON, P.D.

21 SUBSCRIBED AND SWORN TO

22 BEFORE ME THIS DAY

23 OF 2022.

24

25 NOTARY PUBLIC

26 MY COMMISSION EXPIRES

61 (Pages 238 - 241)

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PAC ET AL. EXHIBIT 1147

Page 20 ME2C_SDIA-00017690

Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

- (A) to review the transcript or recording; and
- (B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS
COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

Veritext Legal Solutions is committed to maintaining the confidentiality of client and witness information, in accordance with the regulations promulgated under the Health Insurance Portability and Accountability Act (HIPAA), as amended with respect to protected health information and the Gramm-Leach-Bliley Act, as amended, with respect to Personally Identifiable Information (PII). Physical transcripts and exhibits are managed under strict facility and personnel access controls. Electronic files of documents are stored in encrypted form and are transmitted in an encrypted fashion to authenticated parties who are permitted to access the material. Our data is hosted in a Tier 4 SSAE 16 certified facility.

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