UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF OKLAHOMA

FLEX-CHEM HOLDING COMPANY, LLC; and FLEX-CHEM SERVICES CORPORATION Plaintiffs, v. PHARAOH ENERGY SERVICES, LLC Defendant.	)	Civil Action No. CIV-23-316JD JURY TRIAL DEMANDED

FIRST AMENDED COMPLAINT

Plaintiffs Flex-Chem Holding Company, LLC and Flex-Chem Services Corporation for their First Amended Complaint against Defendant Pharaoh Energy Services, LLC ("Pharaoh" or "Defendant"), allege as follows:

The Parties

1. Plaintiff Flex-Chem Holding Company, LLC is a limited liability company organized and existing under the laws of Oklahoma with a principal place of business at 700 North Wilson Road, Weatherford, Oklahoma 73096. Flex-Chem Holding Company, LLC is the owner of U.S. Patent Nos. 9,944,843; 10,633,575; 11,802,234; and 10,697,282 (hereinafter, "the Asserted Patents").

2. Plaintiff Flex-Chem Services Corporation is a corporation organized and existing under the laws of Oklahoma with a principal place of business at 700 North Wilson Road, Weatherford, Oklahoma 73096. Flex-Chem Services Corporation is the exclusive licensee of the Asserted Patents.

3. Plaintiffs Flex-Chem Holding Company, LLC and Flex-Chem Services Corporation ("collectively, "Flex-Chem" or "Plaintiffs") are companies involved in chemical solutions for the oil and gas industry, including well stimulation and remediation solutions that increase hydrocarbon production.

4. Defendant Pharaoh is a limited liability company organized and existing under the laws of Oklahoma and is a resident of Oklahoma, having a principal place of business in this district at 116 First Street, Velma, OK 73491. Pharaoh is an oil and gas service company that provides well-site services.

Jurisdiction

5. This is an action for patent infringement arising under the Acts of Congress relating to patents, 35 U.S.C. §§ 271; 281-285.

6. This Court has subject matter jurisdiction over Defendant pursuant to 28 U.S.C. §§ 1331 and 1338(a).

7. This Court has personal jurisdiction over Pharaoh because Pharaoh was formed in Oklahoma and has a principal place of business in this district. Venue is proper in this judicial district pursuant to 28 U.S.C. §§ 1391 and 1400(b) because Pharaoh is a resident of this district, has committed acts of infringement in this district, and has a regular and established place of business in this district.

Factual Background

8. Flex-Chem is a technology development leader in the oil and gas industry. Flex-Chem's extensive research and development efforts directed toward improving well production and operations have resulted in several new chemical treatments and technologies that are proven to improve well performance. For example, Flex-Chem's patented well remediation and

stimulation methods are proven to be extremely effective at removing down-hole polymer sludge and increasing the production of fractured wells. With the onset of large-scale oil and gas production from shale formations, Flex-Chem recognized a need for new technology to improve productivity of shale wells and has invested heavily in the development, testing, and protection of Flex-Chem's patented processes for remediation and stimulation of wells, including its OptaSTIM and OptaSTIM-E technologies.

9. Andrew Bryce Conway, as the Technical Director of Flex-Chem, invented a method for stimulation of wells in nano-darcy shale formations and obtained United States Patent No. 9,944,843 (the "'843 patent"). Mr. Conway assigned the '843 patent to Flex-Chem Holding Company, LLC, the current owner thereof. A copy of the '843 patent is attached hereto as **Exhibit 1**. The application that led to the '843 patent was filed on April 14, 2015, and issued on April 17, 2018. It was granted an additional 252 days of term. All required maintenance fees have been paid. The '843 patent is valid and enforceable. Flex-Chem Services Corporation is now and has been the exclusive licensee of '843 patent.

10. Flex-Chem filed a continuation application related to the '843 patent and obtained United States Patent No. 10,633,575 (the "'575 patent"). Mr. Conway assigned the '575 patent to Flex-Chem Holding Company, LLC, the current owner thereof. A copy of the '575 patent is attached hereto as **Exhibit 2**. The application that led to the '575 patent was filed on January 19, 2018, and issued on April 28, 2020. It was granted an additional 133 days of term. The '575 patent is valid and enforceable. Flex-Chem Services Corporation is now and has been the exclusive licensee of '575 patent.

11. Flex-Chem filed a continuation application related to the '843 patent and the '575 patent and obtained United States Patent No. 11,802,234 (the "'234 patent"). Mr. Conway assigned

the ’234 patent to Flex-Chem Holding Company, LLC, the current owner thereof. A copy of the ’234 patent is attached hereto as **Exhibit 3**. The application that led to the ’234 patent was filed on November 15, 2021, and issued on October 31, 2023. It was granted an additional 59 days of term. The ’234 patent is valid and enforceable. Flex-Chem Services Corporation is now and has been the exclusive licensee of the ’234 patent.

12. Mr. Conway and Robert Easterly, an employee of Cimarex Energy Co. (“Cimarex”), after considerable research, testing, and development, invented a unique method for remediating subterranean-formed, metal-polymer complexes in wells and obtained United States Patent No. 10,202,834 (the “’834 patent”). Mr. Conway assigned the ’834 patent to Flex-Chem Holding Company, LLC, and Mr. Easterly assigned the ’834 patent to Cimarex. Cimarex subsequently assigned its interest in the ’834 patent to Flex-Chem Holding Company, LLC, the current owner thereof.

13. Flex-Chem Holding Company, LLC and Cimarex filed a continuation application related to the ’834 patent and obtained United States Patent No. 10,697,282 (the “’282 patent”). Cimarex assigned its interest in the ’282 patent to Flex-Chem Holding Company, LLC, the current owner thereof. A copy of the ’282 patent is attached hereto as **Exhibit 4**. The application that led to the ’282 patent was filed on December 19, 2018, and issued on June 30, 2020. A Certificate of Correction for the ’282 patent was issued on November 3, 2020. The ’282 patent is valid and enforceable. Flex-Chem Services Corporation is now and has been the exclusive licensee of ’282 patent.

14. In 2020, Flex-Chem began performing its patented well remediation and stimulation services for a customer in west-central Oklahoma and has continued to do so through present. However, that customer issued a request for bid proposals for the remediation and

stimulation services in west-central Oklahoma to other well services companies, including Pharaoh.

15. Upon information and belief, in response to its bid, Pharaoh has been hired by that customer to perform, and has performed, well treatments for remediation and stimulation of polymer damage in wells using Flex-Chem's patented processes.

16. On or about February 10, 2023, Flex-Chem learned that Pharaoh had jobs scheduled to treat wells using the same process as Flex-Chem. Upon information and belief, Pharaoh is providing a treatment mixture of about 10% hydrochloric acid and 5% citric acid, which falls squarely within the claims of Flex-Chem's patents; injecting the treatment mixture into the wells at a pressure less than a fracture pressure of the shale formation until at least some of the treatment mixture exits the well and contacts the shale formation; maintaining the treatment mixture in contact with the shale formation for a contact time of between about 1 minute to 100 days, thereby allowing the metal complexing agent to bind with at least some naturally-occurring metals contained within the shale formation; and removing the treatment mixture from the wells after the contact time, thereby removing the bound naturally-occurring metals from the shale formation and thereby improving the hydrocarbon production of the wells relative to the hydrocarbon production immediately prior to performance of the process.

17. On or about February 10, 2023, Flex-Chem put Pharaoh on notice of the '843, '575, and '282 patents via a letter sent by U.S.P.S. Certified Mail. Pharaoh received the notice on February 14, 2023.

18. In mid to late February, 2023, Flex-Chem learned that Pharaoh had been hired to and did provide well treatments for remediation and stimulation of several wells, including those

in west-central Oklahoma; contracts that, but for Pharaoh's infringement of Flex-Chem's patents, would have gone to Flex-Chem.

COUNT I
Patent Infringement of U.S. Patent No. 9,944,843

19. Plaintiffs repeat and re-alleges by reference the allegations of Paragraphs 1-18 above, as if fully set forth herein.

20. On April 17, 2018, United States Patent No. 9,944,843 entitled Stimulation Of Wells In Nano-Darcy Shale Formations was duly and legally issued to Flex-Chem Holding Company, LLC, the patent owner. Flex-Chem Services Corporation is now and has been the exclusive licensee of '843 patent.

21. Defendant has infringed and continues to infringe literally and/or under the doctrine of equivalents at least independent claim 1 of the '843 patent by making, using, offering for sale, and/or selling well stimulation and remediation services for at least the wells in west-central Oklahoma, including at least in the STACK Area.

22. For example, Defendant directly infringed by performing or causing the performance of the method steps of at least claim 1 of the '843 patent in the United States:

A method for stimulating an existing well in a nano-darcy shale formation comprising:

> 22.1: providing a treatment mixture containing between about 0.1% and 95% by weight metal complexing agent at a pH of between about 0 and 10
>
> Upon information and belief, based on the facts above, Defendant provided a treatment mixture containing about 5% citric acid metal complexing agent at a pH of about 0 to 10.
>
> 22.2: injecting the treatment mixture into the well at a pressure less than a fracture pressure of the nano-darcy shale formation until at least some of the treatment mixture exits the well and contacts the nano-darcy shale formation
>
> Upon information and belief, based on the facts above, Defendant injected its treatment mixture into the well at a pressure less than a fracture pressure of the

nano-darcy shale formation until at least some of its treatment mixture exited the well and contacted the nano-darcy shale formation.

22.3: maintaining the treatment mixture in contact with the nano-darcy shale formation for a contact time of between about 1 minute to 100 days, thereby allowing the metal complexing agent to bind with at least some naturally-occurring metals contained within the nano-darcy shale formation

Upon information and belief, based on the facts above, Defendant maintained its treatment mixture in contact with the nano-darcy shale formation for a contact time of between about 1 minute to 100 days, thereby allowing the metal complexing agent to bind with at least some naturally-occurring metals contained within the nano-darcy shale formation.

22.4: removing the treatment mixture from the well after the contact time, thereby removing the bound naturally-occurring metals from the nano-darcy shale formation and thereby improving the hydrocarbon production of the well relative to the hydrocarbon production immediately prior to performance of the method

Upon information and belief, based on the facts above, Defendant removed its treatment mixture from the well after the contact time, thereby removing the bound naturally-occurring metals from the nano-darcy shale formation and thereby improving the hydrocarbon production of the well relative to the hydrocarbon production immediately prior to performance of the method.

23. Defendant has had actual knowledge of the ’843 patent since at least as early as February 14, 2023, when Casey Hays of Pharaoh received a letter from Flex-Chem attaching this patent.

24. Upon information and belief, Defendant continues to offer its well remediation and stimulation services that utilize Flex-Chem’s patented processes.

25. Defendant has willfully infringed and continues to willfully infringe the ’843 patent.

26. Flex-Chem has been damaged by Defendant’s infringement of the ’843 patent and will continue to be damaged in the future unless Defendant is permanently enjoined from infringing the ’843 patent.

COUNT II
Patent Infringement of U.S. Patent No. 10,633,575

27. Plaintiffs repeat and re-alleges by reference the allegations of Paragraphs 1-26 above, as if fully set forth herein.

28. On April 28, 2020, United States Patent No. 10,633,575 entitled Stimulation of Wells in Nano-Darcy Shale Formations was duly and legally issued to Flex-Chem Holding Company, LLC, the patent owner. Flex-Chem Services Corporation is now and has been the exclusive licensee of '575 patent.

29. Defendant has infringed and continues to infringe literally and/or under the doctrine of equivalents at least independent claim 1 of the '575 patent by making, using, offering for sale, and/or selling well stimulation and remediation services for at least the wells in west-central Oklahoma, including at least in the STACK Area.

30. For example, Defendant directly infringed by performing or causing the performance of the method steps of at least claim 1 of the '575 patent in the United States:

> A method for stimulating a well in a shale formation comprising:
>
> 30.1: providing a treatment mixture containing between about 0.1% and 95% by weight metal complexing agent at a pH of between about 0 and 10
>
> Upon information and belief, based on the facts above, Defendant provided a treatment mixture containing about 5% citric acid metal complexing agent at a pH of about 0 to 10.
>
> 30.2 injecting the treatment mixture into the well until at least some of the treatment mixture contacts the shale formation
>
> Upon information and belief, based on the facts above, Defendant injected its treatment mixture into the well until at least some of the treatment mixture contacted the shale formation.
>
> 30.3: maintaining the treatment mixture in contact with the shale formation for a contact time of between about 1 minute to 100 days, most likely less than 30 days, thereby allowing the metal complexing agent to bind with at least some naturally-occurring metals contained within the shale formation

Upon information and belief, based on the facts above, Defendant maintained its treatment mixture in contact with the shale formation for a contact time of between about 1 minute to 100 days thereby allowing the metal complexing agent to bind with at least some naturally-occurring metals contained within the shale formation.

30.4: removing the treatment mixture from the well after the contact time, thereby removing the bound naturally-occurring metals from the shale formation and thereby improving hydrocarbon production of the well relative to hydrocarbon production immediately prior to stimulating the well

Upon information and belief, based on the facts above, Defendant removed its treatment mixture from the well after the contact time, thereby removing the bound naturally-occurring metals from the shale formation and thereby improving hydrocarbon production of the well relative to hydrocarbon production immediately prior to stimulating the well.

31. Defendant has had actual knowledge of the ’575 patent since at least as early as February 14, 2023, when Mr. Hays of Pharaoh received a letter from Flex-Chem attaching this patent.

32. Upon information and belief, Defendant continues to offer its well remediation and stimulation services that utilize Flex-Chem’s patented processes.

33. Defendant has willfully infringed and continues to willfully infringe the ’575 patent.

34. Flex-Chem has been damaged by Defendant’s infringement of the ’575 patent and will continue to be damaged in the future unless Defendant is permanently enjoined from infringing the ’575 patent.

COUNT III
Patent Infringement of U.S. Patent No. 11,802,234

35. Plaintiffs repeat and re-alleges by reference the allegations of Paragraphs 1-34 above, as if fully set forth herein.

36. On October 31, 2023, United States Patent No. 11,802,234 entitled Stimulation Of Wells In Nano-Darcy Shale Formations was duly and legally issued to Flex-Chem Holding

Company, LLC, the patent owner. Flex-Chem Services Corporation is now and has been the exclusive licensee of ’234 patent.

37. Defendant has infringed and continues to infringe literally and/or under the doctrine of equivalents at least independent claim 24 of the ’234 patent by making, using, offering for sale, and/or selling well stimulation and remediation services for at least the wells in west-central Oklahoma, including at least in the STACK Area.

38. For example, Defendant directly infringed by performing or causing the performance of the method steps of at least claim 24 of the ’234 patent in the United States:

A method for stimulating a well in a shale formation comprising:

> 38.1: providing a treatment mixture containing between about 1% and 40% by weight metal complexing agent and between about 0.1 and 30% by weight of acid as pH modifier, wherein the metal complexing agent comprises citric acid, acetic acid, formic acid, or a mixture thereof and the pH modifier comprises hydrochloric acid, hydrofluoric acid, or a mixture thereof
>
> Upon information and belief, based on the facts above, Defendant provided a treatment mixture containing about 5% citric acid and about 10% by weight of hydrochloric acid as pH modifier.
>
> 38.2: injecting the treatment mixture into the well until at least some of the treatment mixture contacts the shale formation
>
> Upon information and belief, based on the facts above, Defendant injected its treatment mixture into the well until at least some of the treatment mixture contacted the shale formation.
>
> 38.3: maintaining the treatment mixture in contact with the shale formation for a contact time of between about 1 minute to 100 days, thereby allowing the metal complexing agent to bind with at least some naturally-occurring metals contained within the shale formation
>
> Upon information and belief, based on the facts above, Defendant maintained its treatment mixture in contact with the shale formation for a contact time of between about 1 minute to 100 days, thereby allowing the metal complexing agent to bind with at least some naturally-occurring metals contained within the shale formation.
>
> 38.4: removing the bound naturally-occurring metals from the shale formation

Upon information and belief, based on the facts above, Defendant's well stimulation results in the removal of the bound naturally-occurring metals from the shale formation.

39. Defendant has had actual knowledge of the '234 patent since at least as early as November 14, 2023, when undersigned counsel for Flex-Chem sent undersigned counsel for Pharaoh a copy of this patent.

40. Upon information and belief, Defendant continues to offer its well remediation and stimulation services that utilize Flex-Chem's patented processes.

41. Defendant has willfully infringed and continues to willfully infringe the '234 patent.

42. Flex-Chem has been damaged by Defendant's infringement of the '234 patent and will continue to be damaged in the future unless Defendant is permanently enjoined from infringing the '234 patent.

COUNT IV
Patent Infringement of U.S. Patent No. 10,697,282

43. Plaintiffs repeat and re-alleges by reference the allegations of Paragraphs 1-42 above, as if fully set forth herein.

44. On June 30, 2020, United States Patent No. 10,697,282 entitled Method for Remediation of Subterranean-Formed Metal-Polymer Complexes Using A Metal Complexing Agent was duly and legally issued to Flex-Chem Holding Company, LLC and Cimarex. Cimarex assigned its interest in the '282 patent to Flex-Chem Holding Company, LLC, the patent owner. Flex-Chem Services Corporation is now and has been the exclusive licensee of '282 patent since.

45. Defendant has infringed and continues to infringe literally and/or under the doctrine of equivalents at least independent claim 1 of the '282 patent by making, using, offering for sale,

and/or selling well stimulation and remediation services for at least the wells in west-central Oklahoma, including at least in the STACK Area.

46. For example, Defendant directly infringed by performing or causing the performance of the method steps of at least claim 1 of the ’282 patent in the United States:

A method for remediating a subterranean-formed metal-polymer complex in a pre-existing well in a subterranean shale formation, the method comprising:

46.1: providing a metal-polymer complex remediation mixture comprising between 0.1% and 95% by weight metal complexing agent

Upon information and belief, based on the facts above, Defendant provided a treatment mixture containing about 5% citric acid metal complexing agent.

46.2: injecting the metal-polymer complex remediation mixture into the well at a pressure less than a fracture pressure of the subterranean formation until at least some of the metal-polymer complex remediation mixture contacts the subterranean-formed metal-polymer complex, wherein the subterranean-formed metal polymer complex forms from a previously injected fracturing fluid and the metal of the subterranean-formed metal-polymer complex includes metal naturally present within the subterranean formation

Upon information and belief, based on the facts above, Defendant injected its metal-polymer complex remediation mixture into the well at a pressure less than a fracture pressure of the subterranean formation until at least some of its metal-polymer complex remediation mixture contacted the subterranean-formed metal-polymer complex, wherein the subterranean-formed metal polymer complex forms from a previously injected fracturing fluid and the metal of the subterranean-formed metal-polymer complex includes metal naturally present within the subterranean formation

46.3: maintaining the metal-polymer complex remediation mixture in contact with the subterranean-formed metal-polymer complex for a contact time of between about 1 minute and about 100 days, thereby allowing the metal complexing agent to cause the subterranean-formed metal-polymer complex to dissociate and dissolve but not precipitate the metal and thereby creating a low viscosity flow back fluid comprising the spent metal-polymer complex remediation mixture and the metal-polymer complex components

Upon information and belief, based on the facts above, Defendant maintained its metal-polymer complex remediation mixture in contact with the subterranean-formed metal-polymer complex for a contact time of between about 1 minute and about 100 days, thereby allowing the metal complexing agent to cause the subterranean-formed metal-polymer complex to dissociate and dissolve but not precipitate the metal and thereby creating a low viscosity flow back fluid comprising the spent metal-polymer complex remediation mixture and the metal-polymer complex components

46.4: removing the low viscosity flow back fluid from the well after the contact time, thereby improving hydrocarbon production of the well

Upon information and belief, based on the facts above, Defendant removed the low viscosity flow back fluid from the well after the contact time, thereby improving hydrocarbon production of the well.

47. Defendant has had actual knowledge of the ’282 patent since at least as early as February 14, 2023, when Mr. Hays of Pharaoh received a letter from Flex-Chem attaching this patent.

48. Upon information and belief, Defendant continues to offer its well remediation and stimulation services that utilize Flex-Chem’s patented processes.

49. Defendant has willfully infringed and continues to willfully infringe the ’282 patent.

50. Flex-Chem has been damaged by Defendant’s infringement of the ’282 patent and will continue to be damaged in the future unless Defendant is permanently enjoined from infringing the ’282 patent.

Prayer for Relief

WHEREFORE, Plaintiffs pray for the following relief:

a. A judgment that Defendant has infringed United States Patent No. 9,944,843;

b. A judgment that Defendant has infringed United States Patent No. 10,633,575;

c. A judgment that Defendant has infringed United States Patent No. 11,802,234;

d. A judgment that Defendant has infringed United States Patent No. 10,697,282;

e. An injunction enjoining and restraining Defendant, its officers, directors, agents, servants, employees, attorneys, and all others acting under or through it, from infringing United States Patent Nos. 9,944,843; 10,633,575; 11,802,234; and 10,697,282;

e. A judgment and order requiring Defendant to pay damages to Flex-Chem under 35 U.S.C. § 284, including treble damages for willful infringement as provided by 35 U.S.C. § 284, with pre- and post-judgment interest;

f. A judgment and order requiring Defendant to pay the costs of this action (including all disbursements) and attorney fees as provided by 35 U.S.C. § 285; and

g. Such other and further relief as this Court may deem just and equitable.

Demand for Jury Trial

Plaintiffs hereby demand a jury trial on all issues so triable.

By its attorneys,

Dated: 12/28/2023

/s/*Ross N. Chaffin*

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CERTIFICATE OF SERVICE

I hereby certify that on December 28, 2023, I electronically transmitted the foregoing document to the Clerk of Court using the NextGen CM/ECF system for filing. Based on the records currently on file in this case, the Clerk of Court will transmit a Notice of Electronic Filing to the following registered participants of the ECF System:

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