IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF OKLAHOMA

FLEX-CHEM HOLDING COMPANY, LLC Plaintiff/Counterclaim Defendant, v. PHARAOH ENERGY SERVICES, LLC Defendant/Counterclaimant.	)	Case No. 5:23-cv-00316-JD

PLAINTIFF FLEX-CHEM HOLDING COMPANY, LLC'S RESPONSIVE CLAIM CONSTRUCTION BRIEF

Oral Argument Requested

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I. Introduction.

Defendant Pharaoh Energy Services, LLC ("Defendant") asks this Court to undertake a considerable amount of work to construe seven patent claim terms. It does so in a self-serving attempt to improperly narrow the scope of the asserted patents in hopes of avoiding infringement liability. None of the disputed terms require construction, however, because the asserted patents give no special definition to any of the terms and they are used in their ordinary sense in the context of the asserted patents. Many of Defendant's constructions would not even make a difference in the case, making construction an academic exercise and waste of the Court's resources.

Not only are Defendant's constructions unnecessary, they are also wrong. Each of Defendant's proposed constructions improperly reads in limitations from other, narrower claims and/or the patent specification—a direct violation of claim construction principles and Federal Circuit precedent. No construction is necessary in this case.

II. Factual Background.

The patented inventions concern remediation and stimulation (*i.e.*, improving oil and gas production) of oil and gas wells. Nano-darcy shale formations, like those in western Oklahoma, typically have a high clay content and a lower permeability as compared to other rock formations. (Dkt. 42-1 at 1:17-36.)[1] Because of the different composition and unique behaviors of nano-darcy shale formations, previous techniques

[1] Citations to patents refer to the column of the patent followed by the line of the patent, i.e., column:row.

were ineffective (or much less effective) at increasing well production in nano-darcy shale formations. (*Id.* at 1:36-42.)

Andrew Bryce Conway, as the Technical Director of Flex-Chem, recognized the need for a better way to improve the productivity of shale wells. After investing significant time, money and energy researching and developing the same, Mr. Conway invented several new methods for stimulating wells in shale formations and for remediating the sludge-like substance that builds up in wells and inhibits well production, subterranean-formed metal-polymer complexes. (*Id.* at Inventor and Abstract; Dkt. 42-2 at Inventor and Abstract; Dkt. 42-3 at Inventor and Abstract.) The unique methods improve oil and gas production of wells using a treatment mixture that includes a metal-bonding substance such as certain acids, called the metal complexing agent, that binds the metals from the shale formation that have become part of the sludge, breaking it up. The metals, now bound to the acid of the treatment mixture, are removed from the well, thereby improving well production.

Mr. Conway's inventions, which have been very successful commercially and financially, are claimed in the three patents asserted in this action, all of which are assigned to Flex-Chem: U.S. Patent No. 9,944,843 (the "'843 Patent") is directed to a method for stimulation of wells in nano-darcy shale formations; U.S. Patent No. 10,633,575 (the "'575 Patent") is a continuation of the '843 Patent; and U.S. Patent No. 10,697,282 (the "'282 Patent") is directed to a method for remediating subterranean-formed metal-polymer complexes in wells. (Dkt. 42-1 at Related Patent Application

Data; Dkt. 42-2 at Related Patent Application Data; Dkt. 42-3 at Related Patent Application Data.) Hereinafter, the "Asserted Patents."

The industry recognized the benefits of Mr. Conway's invention, namely improved oil and gas production in wells, and Flex-Chem's business grew rapidly. It had no competition in the market that it developed for its patented methods of well stimulation and remediation, until Defendant began taking jobs from Flex-Chem. Defendant copied Flex-Chem's patented methods and entered into the marketplace offering the same patented method to Flex-Chem's customer(s), under-cutting Flex-Chem's pricing and taking sales and market share away from Flex-Chem. Flex-Chem has suffered significant harm financially and otherwise, and filed this lawsuit.

Defendant now asks the Court to rewrite the claims of the Asserted Patents in a manner that improperly narrows the scope of the claims by adding limitations that are not present in the claims. The Court should not do so. No construction is necessary.

III. Legal Standard.

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (citations omitted). The focus begins with and remains centered on the language of the claims themselves. *Interactive Gift Express, Inc. v. CompuServe, Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001); (Dkt. 42 at 12-13).[2]

[2] Citations to pages in Defendant's Opening Claim Construction Brief refer to the page numbers found in the ECF header.

Claim terms are generally given their plain and ordinary meaning to a person of ordinary skill in the art ("POSA") "at the time of the invention, *i.e.*, as of the effective filing date of the patent application." *Phillips*, 415 F.3d at 1312-13. The plain meaning of the claim controls unless the patentee clearly disclaims certain matter or acts as its own lexicographer, giving the claim or terms therein a meaning that differs from the plain and ordinary meaning. *Toshiba Corp. v. Imation Corp.*, 681 F.3d 1358, 1369 (Fed. Cir. 2012) ("Absent disclaimer or lexicography, the plain meaning of the claim controls.") (citing *Thorner v. Sony Comput. Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

Claim terms that will be readily understood by the jury and which are used in their ordinary sense within the context of the patent need not be construed. *See*, *e.g.*, *Univ. of Pittsburgh v. Varian Med.Sys., Inc.*, No. 2:08-CV-01307, 2011 U.S. Dist. LEXIS 52078, at *42 (W.D. Pa. Apr. 6, 2011) ("Terms that will be readily understood by a jury, and which do not have a unique meaning within the context of the patent-in-suit, need not be construed."); *Seiko Epson Corp. v. Coretronic Corp.*, No. C 06-06946, 2008 U.S. Dist. LEXIS 39885, at *25 (N.D. Cal. May 16, 2008) (similar).

As Defendant correctly notes, "accused infringers regularly attempt to read language from the specification into the claims to avoid infringement" but "[s]uch attempts are impermissible [] as limitations appearing only in the specification cannot be read into a claim because the 'claims of the patent, not its specifications, measure the invention.'" (Dkt. 42 at 13 (quoting *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1122 (Fed. Cir. 1985).) Indeed, the Federal Circuit has repeatedly cautioned that a court must not import limitations from the specification into the claims. *See, e.g.*, *Thorner*, 669

F.3d at1366 ("We do not read limitations from the specification into claims."); *N. Telecom Ltd. v. Samsung Elecs. Co.*, 215 F.3d 1281, 1290 (Fed. Cir. 2000) ("This court has repeatedly and clearly held that it will not read unstated limitations into claim language.").

Extrinsic evidence such as dictionaries may also be considered when necessary to assist with interpretation of a claim limitation. *See*, *e.g.*, *Bos. Sci. Scimed, Inc. v. Cordis Corp.*, 554 F.3d 982, 985-87 (Fed. Cir. 2009); *Phillips*, 415 F.3d at 1322.

IV. Argument.

A. "Metal(s)"

Claim Term and Where Recited	Defendant's Construction	Plaintiff's Construction
"metal" '843 Patent: Claims 1, 13 '575 Patent: Claims 1, 13 '282 Patent: Claims 1, 21	Naturally-occurring metal ions from the alkaline earth metals (IIA), transition metals (IIIB to IB) and post-transition metals (IIB to IIIA).	No construction necessary.

Defendant admits that the claim language places no constraints on the term "metal," (Dkt. 42 at 16) which makes sense because "metal" is a common, English word that a POSA as well as jurors use and can understand. The claim language uses the plain and ordinary meaning of "metal" and thus requires no construction, which risks limiting the meaning or introducing ambiguity.

Defendant's proposed construction improperly narrows the scope of the claim by limiting the term to only certain groups of metals and by excluding others that are clearly identified as being metals in the specification. Defendant's proposed construction should

be rejected. It should also be rejected because Defendant has identified no noninfringement or invalidity ground that depends on the construction of the term "metal." *See Superior Indus., Inc. v. Masaba, Inc.*, No. 2013-1302, 2014 U.S. App. LEXIS 855, at *6-10 (Fed. Cir. Jan. 16, 2014) (unpublished) (discussing that rendering a construction that does not affect the infringement analysis may amount to an improper advisory opinion). When Defendant injects its treatment mixture into the well, there is no doubt that metals, even if construed as Defendant desires, are bound to that treatment mixture. There is no reason to construe this claim.

(1) The claim language places no limitations on the term "metal."

Claim 1 of the '575 Patent is representative of the claims of the '843 and '575 Patents. It claims a method for stimulating a well in a shale formation that includes "allowing the metal complexing agent (part of the treatment mixture) to bind with at least some naturally-occurring ***metals*** contained within the shale formation; and removing the treatment mixture from the well after the contact time, thereby removing the bound naturally occurring ***metals*** from the shale formation . . . ." (Dkt. 42-2 at 18:42-61 (emphasis added).) In other words, the treatment mixture binds with the metals from the shale formation that have become part of the sludge. The metals are then removed from the well with the treatment mixture, which allows for production of more oil and gas.

Claim 1 of the '282 Patent claims a method for remediating a subterranean-formed metal-polymer complex (sludge) in a pre-existing well in a subterranean shale formation comprising:

> 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;
> . . .

(Dkt. 42-3 at 14:27-42 (emphasis added).)

"Absent disclaimer or lexicography, the plain meaning of the claim controls." *Toshiba*, 681 F.3d at 1369 (citing *Thorner*, 669 F.3d at 1365). Here, as Defendant admits, nothing indicates any intention to impart any meaning to the term "metal" other than its plain and ordinary meaning. Yet, Defendant does exactly that. It limits the term "metal" to only three categories of naturally-occurring metal ions: the alkaline earth metals (IIA), transition metals (IIIB to IB), and post-transition metals (IIB to IIIA).[3] Plaintiff is entitled to the full scope of "metal," meaning all metals, not only those identified by Defendant.

(2) The specification contradicts Defendant's construction.

The specifications of the Asserted Patents in no way modify or limit the meaning of the term "metal." Despite this, Defendant's proposed construction improperly limits the term "metal" based on an exemplary list of metals identified in the specification. (Dkt. 42 at 17.) Worse, Defendant's construction excludes at least two metals expressly included in the patent specifications: potassium and sodium.

[3] Defendant's references to IIA, IIB to IB, and IIB to IIIA presumably refer to the various groups of elements found on the Periodic Table of Elements.

Although Defendant is correct that aluminum, barium, calcium, magnesium, manganese, iron, and strontium fall under the categories of alkaline earth metals, transition metals, and post-transition metals (*id.*), nothing in the patent suggests that the term "metal" is limited to just these metals. Rather, the language of the specification relied upon by Defendant makes clear that list is not exclusive: "[T]he introduction of hydraulic fracturing fluids and/or acid treatments that release metal ions through their interaction with the formation materials, ***such as*** aluminum, barium, calcium, magnesium, manganese, iron, strontium, boron and other metals or metalloids." (Dkt. 42 at 16-17 (citing Dkt. 42-1 at 4:33-38 and Dkt. 42-2 at 4:35-40) (emphasis added).) Use of "such as" indicates a non-exhaustive list. (Ex. 1 at 1391 (defining "such as" to mean "for example").) In short, Defendant improperly asks the Court to import a non-exhaustive list from the specification into the claims.

Moreover, Defendant's proposed construction excludes two metals, potassium and sodium, identified as part of the preferred method. (Dkt. 42-1 at 14:5-15:14.) The '843 and the '575 Patents describe two experiments run on shale materials mixed with an embodiment of the claimed treatment mixture. (*Id.* (Examples 1-2).)[4] Those experiments found potassium and sodium naturally present in the shale and that they were effectively removed from the shale by the treatment mixture. (*Id.* at 14:5-44 (Example 1); *see also*, *id.* at 14:45-15:14 (Example 2).)

[4] Because the '843 and '575 Patents share a common specification, this brief cites to the '843 Patent's specification unless otherwise noted.

Importantly, potassium and sodium are ***not*** alkaline earth metals (IIA), transition metals (IIIB to IB), or post-transition metals (IIB to IIIA), the groups to which Defendant limits its proposed construction. Defendant's proposed construction would exclude a well-known group of metals—the Alkali metals—as well as two metals specifically identified as being naturally occurring in shale formation and binding with the treatment mixture. (Ex. 1 at 33 (alkali metal), 1069 (potassium), 1320 (sodium); Ex. 2 at 29 (alkali metal), 911 (potassium), 1115-1116 (sodium); Ex. 3 (identifying and describing metals as including alkali metals and potassium and sodium).) This is improper. *SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1285 (Fed. Cir. 2005) ("A claim construction that excludes a preferred embodiment, moreover, 'is rarely, if ever, correct.'") (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996)).

Where neither the claim language nor the specification limit the meaning of "metal," no construction is warranted, and Defendant's proposed construction, contradicted by the specification, should be rejected.

(3) The prosecution history does not support Defendant's proposed construction.

Defendant argues that statements made during prosecution that "metal ions from the metal-polymer complexes formed by crosslinking with metal ions naturally present within the formation" means the term "metals" "includes only those 'metal ions naturally present within the formation.'" (Dkt. 42 at 17.) Defendant is wrong.

The remarks identified by Defendant were directed to draft claim 21 which claimed "the metal of the subterranean-formed metal-polymer complex ***including metal***

naturally present within the subterranean formation." (Dkt. 42-7 at PHAROAH_000910-12.) The draft claim expressly included a modifying clause stating that the metal included naturally present metals. This modifying clause and use of the non-limiting term "including" indicates that the term "metal" itself is not limited to just metal ions naturally present within the formation; otherwise, the modifying clause would be redundant. More importantly, Defendant's proposed construction excludes metal ions that are identified in the Asserted Patents as being naturally present within the formation. As explained above, Examples 1 and 2 in the '843 and '575 Patents show that potassium and sodium are naturally present within the formation, yet Defendant's proposed construction excludes these naturally present metal ions, which is improper.

Defendant's proposed construction, which improperly narrows the term "metal" and which excludes elements identified as part of the preferred method, should be rejected. No construction is needed for such a common term.

B. "pH modifier"

Claim Term and Where Recited	**Defendant's Construction**	**Plaintiff's Construction**
"pH modifier" '843 Patent: Claim 7 '575 Patent: Claim 7 '282 Patent: Claims 7, 11, and 12	Hydrochloric acid.	No construction necessary.

Defendant's construction should be rejected because it attempts to limit the term "pH modifier" to just one acid—hydrochloric acid—when the claims and specification make clear that the term "pH modifier" is not limited to only hydrochloric acid.

(1) Defendant's proposed construction is contradicted by the claims.

Claim construction analysis begins with the claims themselves. *Marine Polymer Techs., Inc. v. Hemcon, Inc.*, 672 F.3d 1350, 1358 (Fed. Cir. 2012); *Phillips*, 415 F.3d at 1312. Defendant again attempts to improperly narrow an otherwise broad claim term. While hydrochloric acid is a pH modifier, it is not the only pH modifier. Each of the claims makes clear that the term "pH modifier" is not limited to only hydrochloric acid as Defendant proposes.

For example, several claims expressly state that the pH modifier can be several different acids. Claim 7 of the '282 Patent claims "[t]he method of claim 6**,** wherein the metal complexing agent comprises . . . between 0.1 and 30% ***of one or more acids as a pH modifier*** . . . ." (Dkt. 42-3 at 15:50-53 (emphasis added).) Claim 12 includes similar language directed to "***one or more acids as a pH modifier***." (*Id.* at 16:8-10; *see also*, Dkt. 42-1 at 19:50-52 (claiming "between 0.1 and 95% ***acid(s)*** as pH modifier") (emphasis added).) Defendant's proposed construction limits pH modifier to just one acid in direct contravention to the claims, which expressly allows for more than one acid for use as a pH modifier. If Mr. Conway had meant to limit his invention to just hydrochloric acid as the only pH modifier, he could have done so. He did not.

Claim differentiation further shows that Defendant's proposed construction is wrong. Use of narrower, dependent claims presumes a broader meaning in the claims from which the dependent claim depends. *E.g.*, *Phillips*, 415 F.3d at 1314-15 ("[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim."); *Andersen Corp.*

v. Fiber Composites, LLC, 474 F.3d 1361, 1369 (Fed. Cir. 2007) ("To the extent that the absence of such difference in meaning and scope would make a claim superfluous, the doctrine of claim differentiation states the presumption that the difference between claims is significant.") (citation omitted); *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 909-10 (Fed. Cir. 2004). Here, claim 12 is broadly directed to "[t]he method of claim 11, wherein the metal-polymer complex remediation mixture further comprises between 0.1 and 30% of ***one or more acids as a pH modifier***" without claiming any particular acid as the pH modifier. (Dkt. 42-3 at 16:8-10.) Claim 13, on the other hand, is directed to a narrower list of specific acids as pH modifiers including hydrochloric acid, aqua regia, arsenic acid, boric acid, carbonic acid, chloric acid, and many more. (*Id.* at 16:11-22.) This necessarily means that "pH modifier" is not limited to just hydrochloric acid. This is further confirmed by claim 14, which is specifically directed to only hydrochloric acid as the "pH modifier." (*Id.* at 16:23-24.) Defendant asks this Court to read the narrow limitation of claim 14 (i.e., hydrochloric acid as the "pH modifier") into every claim that includes the term "pH modifier" in violation of the principles of claim differentiation. This should be rejected. *E.g.*, *Phillips*, 415 F.3d at 1314-15; *Andersen Corp. v*, 474 F.3d at 1369; *Liebel-Flarsheim Co.*, 358 F.3d at 909-10.

(2) The specification and prosecution history do not support Defendant's narrow construction.

When "the claim language is clear on its face, then [the court's] consideration of the rest of the intrinsic evidence is restricted to determining if a deviation from the clear language of the claims is specified." *Interactive Gift Express, Inc.*, 256 F.3d at 1331.

Here, nothing in the specification or prosecution history warrants deviating from the language of the claims which makes clear that the term "pH modifier" is not limited to only hydrochloric acid.

Defendant acknowledges that the specification enumerates other acids, but still asks this Court to limit the pH modifier to only hydrochloric acid because the Asserted Patents include examples that utilize hydrochloric acid. (Dkt. 42 at 19.) Defendant's request is legally wrong. Federal Circuit precedent holds that a court cannot import limitations from the specification into the claims. *See, e.g.*, *Thorner*, 669 F.3d at 1366 ("We do not read limitations from the specification into claims . . . ."); *N. Telecom Ltd.*, 215 F.3dat 1290. Here, Defendant's request is even more egregious because the specification makes clear that several acids can serve as pH modifiers. (Dkt. 42-1 at 7:49-63; Dkt. 42-3 at 8:13-27.) Defendant's proposed construction, limiting the pH modifier to only hydrochloric acid, should be rejected. No construction is necessary.

C. "induced fractures"

Claim Term and Where Recited	Defendant's Construction	Plaintiff's Construction
"induced fractures" '843 Patent: Claim 10 '575 Patent: Claim 10	Flow paths within the formation that were created by fracking fluids during the hydraulic fracturing process.	No construction necessary.

Defendant seeks to use 16 words to construe the two-word, non-technical term "induced fractures." The Asserted Patents provide ample explanation of the term, and it is easily understood by both a POSA and the jury. There is no need to construe it. This is also true for the separate reason that Defendant has put forth no reason why this term

needs to be construed for the purposes of infringement or invalidity. *See Superior Indus., Inc.*, 2014 U.S. App. LEXIS 855, at *6-10.

(1) The claim language contradicts Defendant's construction.

Defendant's proposed construction again imports limitations not present in the claims. In particular, Defendant's proposed construction seeks to limit how induced fractures are created (*i.e.*, only by fracking fluids) and when the induced fractures are created (*i.e.*, only during the hydraulic fracturing process). (Dkt. 42 at 20.) Nothing in the claims include such limitations. Contrary to Defendant's contentions, the fact that the treatment mixture is injected in combination with hydraulic fracturing does not require that the fracturing fluids created the induced fractures and does not require that the fractures be created as part of the fracturing process.

(2) The specification does not support Defendant's narrow construction.

Similarly, nothing in the specification supports that the Asserted Patents use the term "induced fractures" in such a narrow manner. Nowhere did the applicant provide a specific and unique definition for "induced fractures." Rather, the Asserted Patents provide context to explain the term "induced fractures," and, in each instance that the term "induced fractures" appears in the specification, it is used in its ordinary sense. This is not an instance where a term of art is highly technical or difficult to understand such that it might, arguably, warrant construction. The words "induced" and "fractures" are both common, English words that the jury will be familiar with and will understand.

Because the Asserted Patents use the ordinary meaning of "induced fracture" and because the term is easily understood, the term "induced fracture" should not be construed. *E.g.*, *Interactive Gift*, 256 F.3d at 1331; *Select Retrieval LLC v. Amerimark Direct LLC*, C.A. No. 1:11-cv-00812-RGA, 2013 U.S. Dist. LEXIS 149225, at *12 (D. Del. Oct. 17, 2013); *Univ. of Pittsburgh*, U.S. Dist. LEXIS 52078, at *42; *Seiko Epson Corp.*, 2008 U.S. Dist. LEXIS 39885, at *25.

D. "fracture pressure"

Claim Term and Where Recited	**Defendant's Construction**	**Plaintiff's Construction**
"fracture pressure" '843 Patent: Claim 1 and 9 '282 Patent: Claims 1, 17, and 21	The pressure at which the formation rocks splits, creating new flow paths therein.	No construction necessary.

There is no need to construe the term "fracture pressure" either because the term uses common, English words, "fracture" and "pressure," which will be understood by a POSA and the jury. Defendant admits that the Asserted Patents explain the term "fracture pressure" and use it as a POSA and jury would typically understand the term. Defendant's proposed construction invites ambiguity and confusion by adding more words to an easily understood term.

Separately, Defendant has not put forth any infringement or invalidity ground that would necessitate construction of this term. Thus, the Court should not construe it. *See Superior Indus., Inc.*, 2014 U.S. App. LEXIS 855, at *6-10.

(1) Defendant admits that no construction is needed.

Defendant admits that a POSA would understand the term "fracture pressure" by reading the patents and that the Asserted Patents use the plain and ordinary meaning of that term. (Dkt. 42 at 22-23 ("The language strongly suggests that the term 'fracture pressure' pertains to the pressure required for the formation rock to fracture, aligning with the typical understanding of hydraulic fracturing . . . .").) Defendant points to nothing in the claims that suggests the term "fracture pressure" has been given a special definition or otherwise has been used in a manner that requires construction. That is because there is no support for such an argument. Instead, Defendant merely seeks to add words to describe a term that is already easily understood. This is unnecessary.

(2) The specification does not support Defendant's construction.

As Defendant acknowledges, the specification explains the term "fracture pressure," noting it is "the pressure required to substantially fracture the formation." (Dkt. 42 at 23.) This is not a technical term that the jury would have difficulty understanding, particularly in light of the explanation provided by the specification. And Defendant points to nothing in the specification that suggests the term "fracture pressure" is being used in a manner that differs from its plain and ordinary meaning. No construction is necessary.

Moreover, Defendant's construction is inconsistent with the explanation of "fracture pressure" in the specification—"the pressure required to substantially fracture the formation." (Dkt. 42 at 23.) Defendant's proposed construction inexplicably drops the

"substantially" modifier that is found in the specification and includes additional words—"creating new flow paths therein"—which are not found within the specification.

Given that "fracture pressure" is an easily understood term that is used in its ordinary sense, there is no need for construction. But, to the extent any construction is adopted, it should be consistent with the explanation provided in the specification: "the pressure required to substantially fracture the formation." (Dkt. 42-1 at 1:50-55.)

E. "shale formation"

Claim Term and Where Recited	Defendant's Construction	Plaintiff's Construction
"shale formation" '843 Patent: Claims 1 and 9 '575 Patent: Claim 1 '282 Patent: Claims 1 and 21	A mixture of clay minerals and larger particles, wherein the clay minerals are not normally spherically shaped and exhibit electro-static properties.	No construction necessary.

The term "shale formation" needs no construction. It is a common term of art used in its ordinary sense in the Asserted Patents. Indeed, the use of "shale formation" in the Asserted Patents is consistent with the term's use in references cited on the face of the Asserted Patents. (*See e.g.*, Ex. 4 at 1:13-16 ("The rock formations can be distinguished by their major components and one category is formed by the so-called shale formations, which contain very fine particles of many different clays covered with organic materials to which gas and/or oil are adsorbed.").)[5] Defendant's proposed construction merely adds more words, which is likely to complicate the term and make it more difficult for a jury

[5] Prior art cited in the file history is considered part of the intrinsic record for claim construction and can be helpful to the Court. *See Phillips*, 415 F.3d at 1317.

to understand. *See Cormack v. United States*, 119 Fed. Cl. 63, 74 (2014) (rejecting defendant's proposal to add additional words in construing the claim term and determining that no construction is required). Why would the jury be able to understand "electro-static properties" but not "shale formation"?

A construction of this term also will not affect the infringement analysis. Defendant's well stimulation services are performed on wells in shale that meet Defendant's proposed construction of shale such that Defendant would still infringe even under its own proposed construction. No construction of this term is necessary. *See Superior Indus., Inc.*, 2014 U.S. App. LEXIS 855, at *6-10.

(1) The claim language does not support limiting "shale formation."

Claim 1 of the '575 Patent is representative and recites in part:

> A method for stimulating a well in a shale formation comprising:
>
> . . .
>
> injecting the treatment mixture into the well until at least some of the treatment mixture 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
>
> . . .

(Dkt. 42-2 at 18:42-61 (emphasis added).)

Defendant does not point to any claim language that supports its construction. Rather, Defendant only argues that the claim language is compatible with its proposed construction, and the claim language does not conflict with its construction—but this is

not a principle of claim construction. Nothing in the claim language supports Defendant's attempt to import "a mixture of clay minerals and larger particles, wherein the clay minerals are not normally spherically shaped and exhibit electro-static properties" into the claims. Defendant's narrow construction is contradicted by the claims.

(2) It is erroneous to read limitations from the specification into the claims.

Defendant's proposed construction reads limitations from the specification into the claims, which is *per se* improper. *See, e.g.*, *Thorner*, 669 F.3d at 1366 ("We do not read limitations from the specification into the claims."); *N. Telecom Ltd.*, 215 F.3d at 1290 (similar). The specification provides an explanation that shale formations are "a mixture of clay minerals and larger particles" and that "[c]lay minerals are not normally spherically shaped and also exhibit electro-static properties not found in non-clay materials." (Dkt. 42-1 at 1:29-32). But reading this explanation into the claims would be error. *Cont'l Circuits LLC v. Intel Corp.*, 915 F.3d 788, 797 (Fed. Cir. 2019) (reversing district court decision importing limitation from specification into claims). Where the meaning of a term is clear within the context of a patent and easily understood by both a POSA and the jury, as it is here, no construction is necessary. *Univ. of Pittsburgh*, U.S. Dist. LEXIS 52078, at *42.

(3) The prosecution history does not support Defendant's narrow construction.

Defendant argues that the prosecution histories are generally silent with respect to "shale formation," so they are consistent with Defendant's construction. (Dkt. 42 at 26.) But silence in the prosecution histories with respect to "shale formation" does not support

Defendant's narrow construction. Rather, a lack of any clear and unmistakable disavowal of claim scope in the prosecution history supports no construction instead of adopting a narrower construction. *See ACTV, Inc. v. Walt Disney Co.*, 346 F.3d 1082, 1092 (Fed. Cir. 2003) (where patentee's arguments in prosecution history were not related to the disputed limitation, ruling that "the prosecution history does not inform a definition other than the ordinary and customary meaning of the term").

F. "nano-darcy shale formation"

Claim Term and Where Recited	**Defendant's Construction**	**Plaintiff's Construction**
"nano-darcy shale formation" '843 Patent: Claims 1 and 9	An oil or gas-bearing shale formation with a permeability to injected fluids of less than 100 nanodarcies	No construction necessary.

The term "nano-darcy shale formation" also needs no construction. Defendant's proposed construction seeks to improperly narrow the term by adding the limitation of a permeability of less than 100 nanodarcies. However, the specification expressly discloses permeability up to 1000 nanodarcies so Defendant's construction is directly in conflict with the specification. Nor is it supported by the claims or prosecution history. Additionally, no noninfringement ground depends on the construction of this term. Defendant's well stimulation services are performed on wells in shale having a permeability of less than 100 nanodarcies. Accordingly, even if the Court adopted Defendant's narrow construction, which it should not, Defendant would still infringe. Construction is therefore not necessary. *See Superior Indus., Inc.*, No. 2013-1302, 2014 U.S. App. LEXIS 855, at *6-10.

(1) The claim language does not support limiting "nano-darcy shale formation."

Claim 1 of the '843 Patent is representative and recites in part:

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

(Dkt. 41-1 at 18:61-19:16 (emphasis added).)

Defendant alleges that the claim language supports its construction, but then makes no argument to this effect. Defendant merely states that the claim language is compatible with and does not conflict with Defendant's construction. (Dkt. 42 at 26-27.) That is not the test. Nothing in the claim language supports Defendant's attempt to limit "nano-darcy shale formation" to a particular permeability. Because the claim language itself places no limitations on this term, Defendant's narrow construction is not supported by the claims.

(2) Defendant's proposed construction is inconsistent with the specification.

It is improper to read limitations from the specification into the claims as Defendant has done with its proposed construction of "nano-darcy shale formation." *See, e.g.*, *Thorner*, 669 F.3d at 1366; *N. Telecom Ltd.*, 215 F.3d at 1290. Worse, Defendant seeks to import limitations that are contradicted by the specification. The specification describes nano-darcy shale formations as having a permeability in at least one direction of less than 1 micro-darcy (i.e., $1x10^{-6}$ darcy), which is ***1000 nano darcies***. (Dkt. 42-1 at

1:14-17.) Defendant's inclusion of "less than ***100 nanodarcies***" in its proposed construction is inconsistent with the permeability in the specification by a factor of ten.

(3) The prosecution history does not support Defendant's proposed construction.

Again, that the prosecution histories are generally silent with respect to "nano-darcy shale formation" (Dkt. 42 at 27) does not support Defendant's construction. To the contrary, it supports Flex-Chem's argument that no construction is needed because there is no clear and unmistakable disavowal of claim scope in the prosecution history to support adopting a narrower construction. *See ACTV, Inc.*, 346 F.3d at 1092.

G. "metal polymer complex"

Claim Term and Where Recited	Defendant's Construction	Plaintiff's Construction
"metal polymer complex" '282 Patent: 1, 6, 8-12, 15-17, 21, and 22	A structure formed subterraneously by in-situ crosslinking or complexing of metal ions with fracturing fluid polymer molecules in a shale formation	No construction necessary.

Defendant again has not provided any reason why this term needs to be construed for purposes of infringement or invalidity, so there is no need to construe it. Defendant's proposed construction also seeks to add 18 additional words to define the three-word claim term. Several of those additional words are already present elsewhere in the claim or have been imported from the specification, which both complicates and renders redundant the original claim language. Defendant's construction should be rejected. No construction is necessary.

(1) Defendant's proposed construction renders the claim language redundant.

Claim 1 of the '282 Patent is representative and recites in part:

> 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

(Dkt. 42-3, at 14:33-42 (emphasis added).) The claim language expressly includes that the "metal-polymer complex" is a "subterranean-formed metal-polymer complex." Defendant's construction (*i.e.*, "a structure formed subterraneously by in-situ") would duplicate the term "subterranean-formed," which already appears in the claim. Doing so violates claim construction concepts because it would render the original claim language redundant. *See Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1237 (Fed. Cir. 2016) ("Construing a claim term to include features of that term already recited in the claims would make those expressly recited features redundant.").

Additionally, the claim language only requires that the "metal-polymer complex" be formed "from a previously injected fracturing fluid" and include "metal naturally present within the subterranean formation." Nothing in the claim language supports importing limitations from the specification that the "metal-polymer complex" be formed "by in-situ crosslinking or complexing of metal ions with fracturing fluid polymer molecules" as Defendant proposes. *See Prima Tek II, L.L.C. v. Polypap, S.A.R.L.*, 318 F.3d 1143, 1149-52 (Fed. Cir. 2003) (holding district court's construction was erroneous

where claim language did not support additional limitations in its construction of "floral holding material" and concluding that the term must be given its ordinary meaning). The meaning of the term is clear from the claim language itself so the term needs no construction.

(2) Defendant's construction is improperly limited to a specific example in the specification.

The '282 Patent states that "***[w]ithout being bound to a particular theory,*** . . . the polymer can cross-link with metals present or introduced into the subterranean formations and form metal-polymer complexes." (Dkt. 42-3 at 4:36-41(emphasis added).) Defendant asks this Court to import this specific example from the specification into the claims. This is legally wrong, *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1328 (Fed. Cir. 2002) (cautioning against limiting the claims to preferred embodiments or specific examples in the specification), and inconsistent with the specification which makes clear this is just one theory as to how metal-polymer complexes are formed. Defendant's construction which is inconsistent with the law and the specification should be rejected. No construction is necessary.

(3) The prosecution history does not support Defendant's proposed construction.

Statements made during prosecution of the '282 Patent do not support Defendant's narrow construction. The inventor's attorney, in distinguishing the claimed invention, stated that the prior art "does not disclose or suggest metal naturally present within the subterranean formation complexing with polymers in fracturing fluids" (Dkt. 42 at 30). But Defendant misses the point being made with that statement: the prior art concerned

removal of metals ***added*** to the well fluid, but the invention concerns removal of metal ***naturally*** present in the shale. (Dkt. 42-7 at PHARAOH_000910-911.) The claim language itself makes clear that the invention concerns metals *naturally* present in the shale formation. (*See* Dkt. 42-3 at 14:4-42.) Thus, the emphasis on this language in the prosecution history is emphasizing express claim language, metals naturally occurring in the shale, which was not taught by the prior art. That does not constitute a disclaimer of claim scope that would support a narrow construction of this term. *See Vectura Ltd. v. Glaxosmithkline LLC*, 981 F.3d 1030, 1039 (Fed. Cir. 2020).

V. Conclusion.

Defendant asks this Court to construe seven patent claim terms. However, many of Defendant's proposed constructions would have no bearing on this case, making construction a waste of the Court's time and resources. All of Defendant's proposed constructions improperly import limitations from the specification or, worse, from other narrower claims. That violates claim construction law. No construction is needed. Flex-Chem respectfully requests oral argument on the construction of the foregoing claim terms.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on December 14, 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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