Chapter 14

Who Owns Heat?
Ownership of Geothermal Energy and Associated Resources Under Texas Law

B. Sebree

Heat, energy, steam, hot water, hot brines, and geopressured water are not minerals under Texas law. Therefore, in the event of a severance of the mineral estate from the surface estate in Texas, geothermal energy and associated resources should be held as belonging to the surface estate, absent a specific statement to the contrary in a controlling document.

I. Introduction

At the time of this writing, no Texas Court ruling can be found determining the ownership of geothermal energy and associated resources as a constituent of the surface or of the mineral estate, and in 1975 the Texas Legislature expressly declined to express an opinion regarding ownership. [1] However, well-established legal precedents, rules of construction under Texas case law, and statutory law inevitably lead to the conclusion that geothermal energy and associated resources belong to the surface owner of real property in Texas, absent a controlling document to the contrary.

A. Key Concepts

The ownership of any real property interest in Texas is determined by the intent of the parties to the deed, conveyance, reservation, lease, or other legally binding document in question. [2]

In the event of a severance between the surface and the mineral estates, we look to the intent of the parties as expressed within the four corners of the controlling document(s) in the property records. [3]

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With the exception of the minerals and their accompanying rights, Texas law establishes that all interests in the original parcel of land from which an "oil, gas, and other minerals" estate is severed remains the property of the original parcel of land, i.e., the surface estate. [4] This includes all property interests without limitation, unless there is a specific controlling document to the contrary. [5] This encompasses ownership of all non-mineral molecules of the land, of the mass of earth undergirding the surface, and even of empty space within the earth. [6] Therefore, it includes geothermal energy and associated resources.

If the records are silent with no mention of any conveyance, reservation, or lease of any geothermal energy and associated resources, the inquiry should be complete, because Texas law firmly establishes that the surface owner retains possession of *everything* that was not severed. [7] Therefore, the surface owner retains possession of the geothermal energy and associated resources, because there was never a severance of such resources from the original parcel of land.

Nonetheless, because certain advocates may argue that "other minerals" in a mineral estate conveyance, reservation, or lease should be interpreted so as to include "geothermal energy and associated resources," we follow Texas statutes and established Texas Supreme Court precedents regarding how to analyze the phrase "other minerals."

B. Texas Statutes

The Texas Property Code provides that "**mineral**" means "**oil, gas, uranium, sulphur, lignite, coal, and any other substance that is ordinarily and naturally considered a mineral in this state, regardless of the depth at which the oil, gas, uranium, sulphur, lignite, coal, or other substance is found**." [8] Geothermal energy and associated resources do not fit that definition.

C. Texas Supreme Court Precedents

1. The Surface Estate as a Matter of Law Test

The following resources contained in the definition of "geothermal energy and associated resources" [9] all belong to the surface estate as a matter of law because they are all forms of groundwater: steam, hot water and hot brines, and geopressured water. [10]

2. The Ordinary and Natural Meaning Test

The Texas Supreme Court established the ordinary and natural meaning test to determine if a substance is or is not a mineral as follows, "**We now hold a severance of minerals in an oil, gas and other minerals clause includes all substances within the ordinary and natural meaning of that word, whether their presence or value is known at the time of severance.**" [11]

Other than groundwater, the remaining two resources contained in the definition of "geothermal energy and associated resources" which require analysis are "heat" and "energy." [12] Under Texas law, all minerals are substances. [13] "Heat" and "energy" are not substances. "Heat" and "energy" are intangible qualities or properties of the earth itself, and thus, are definitively not minerals.

Certainty in the ownership of this abundant and inexhaustible energy resource is critical if Texas is going to develop this resource. This article discusses and traces the applicable statutes, legal precedents, and rules of construction under Texas law and demonstrates how they lead to the conclusion that geothermal energy and associated resources belong to the surface estate.

2. The Geothermal Resources Act of 1975

Texas has recognized "geothermal energy and associated resources" as a valuable energy resource since 1975. This is the phrase that was adopted and defined by the Texas Legislature when it passed the Geothermal Resources Act of 1975 ["the "Act"]. [14] Section 141.002 of the Act declares it to be "the policy of the State of Texas that … the rapid and orderly development of geothermal energy and associated resources located within the State of Texas is in the interest of the people of the State of Texas."

The Act achieves a number of things. First, it defines the nature and scope of geothermal resources. Second, it vests in the Railroad Commission of Texas ("RRC") the jurisdiction to regulate the exploration, development, and production of geothermal energy and associated resources on public and private land for the purpose of

conservation and the protection of correlative rights. [15] Finally, it grants the Commissioner of the General Land Office ("GLO") the power to explore and issue permits for the development of geothermal energy and associated resources on land belonging to the Permanent School Fund. [16]

A. Definition

The Act defines "geothermal energy and associated resources" as follows:

Sec. 141.003. DEFINITIONS. In this chapter:

(4) "Geothermal energy and associated resources" means:

(A) products of geothermal processes, embracing indigenous steam, hot water and hot brines, and geopressured water;

(B) steam and other gasses, hot water and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations;

(C) heat or other associated energy found in geothermal formations; and

(D) any by-product derived from them. [17]

(5) "By-product" means "any other element found in a geothermal formation which is brought to the surface, whether or not it is used in geothermal heat or pressure inducing energy generation." [18]

B. Geothermal Resources Are to Be Treated and Produced as Mineral Resources but that Does Not Mean that They Are Minerals

The Texas Geothermal Resources Act states the following:

(4) since geopressured geothermal resources in Texas are an energy resource system, and since an integrated development of components of the resources, including recovery of the energy of the geopressured water without waste, is required for best conservation of these natural resources of the state, all of the resource system components, as defined in this chapter, shall be treated and produced as mineral resources.... [19]

It is crucial to note that the act says that geothermal energy and associated resources are to be "treated and produced **as** minerals." It does not say that they **are** minerals. Nor does the act pronounce that geothermal energy and associated resources are considered to be the property of the mineral estate. Moreover, in the very next clause, the act states the following:

(5) in making the declaration of policy in Subdivision (4) of this section, there is no intent to make any change in the substantive law of this state, and the purpose is to restate the law in clearer terms to make it more accessible and understandable. [20]

The above statement in Subdivision (5) is a clarification by the Texas Legislature that it is neither establishing nor attempting to reestablish any property rights regarding the ownership of geothermal energy and associated resources. Moreover, Subdivision (5) is an acknowledgement by the Legislature that the Legislature does not possess the authority to alter established property rights. [21] In other words, if geothermal energy and associated resources are and always have been a property right possessed by surface owners, then the Legislature does not have the authority to take this resource away from surface owners and give it to mineral owners, nor vice versa. Whether a property interest, be it oil, gas, mineral, water, geothermal energy, or any other resource is owned by the mineral estate, the surface estate, or some other estate is determined by the intent of the parties to the property interest in question.

III. Original Ownership of Real Property in Texas Includes Everything

Texas real property law begins at the starting point where the original owner of a parcel of property owns everything on the surface and beneath the surface. This concept is reflected in the Latin "ad coelum" doctrine attributed to the 13th-century jurist Accursius, "*cujus est solum, ejus est usque ad coelum et ad inferos*." Typically translated as meaning "*whoever's is the soil, it is theirs all the way to Heaven and all the way to Hell*." Although the doctrine contains obvious poetic hyperbole, it is well established in Texas that a fee simple owner of land owns *everything* concerning that parcel of real property without limitation unless so stated. [22] Fee Simple means "[a]n estate in land that is conveyed or devised is a fee simple *unless the estate is limited* by express words or unless a lesser estate is conveyed or devised by construction or operation of

law. [23] This concept is often referred by analogy as the "bundle of sticks" or "bundle of rights" as in, an owner of property owns all of the bundle of sticks or property rights until and unless one or more of those rights is specifically severed and conveyed to another. [24]

The original owners of parcels of land historically were called owners of the soil, and are now commonly referred to as surface owners. [25] Landowners may divide their property or convey any portion or right in their property to anyone else as they see fit. [26] A common severance of real property interests in Texas — and the one which concerns this article — is the severance between the surface and the mineral estates. For purposes of illustration, it is useful to imagine the original, full bundle of sticks or property rights. If the original owner severs the oil, gas, and other minerals, then the question becomes, who owns the geothermal energy and associated resources? Is it the surface owner, or the owner of the oil, gas, and other minerals? The answer is the surface owner, because the severance did not include any geothermal energy or associated resources. Therefore, they stayed with the rest of the original bundle of sticks. The surface owner retained ownership of all the other sticks in the bundle. The severance only included oil, gas, and other minerals. Because geothermal energy and associated resources are neither oil, nor gas, nor other minerals under Texas law, the geothermal energy and associated resources remained with the surface owner. This will be demonstrated throughout the article below.

Importantly, the "surface estate" does not mean that it only refers to the surface, as is sometimes misunderstood. The surface estate refers to everything — *to all property rights* — except those which have been severed. In the example where "oil, gas, and other minerals" have been severed from the original fee simple estate, the surface estate refers to all the bundle of property rights, *everything*, except the oil, gas, and mineral rights. [27] Long ago in a case which has been upheld numerous times, the Texas Supreme court held that the "surface, and ***everything*** in the land itself, except the minerals covered by the lease, was still in their possession and was their property, subject to a reasonable use, qualified only by the express provisions of the lease...." [28] In another case, the Texas Supreme Court clarified, "In the law of servitudes, the mineral estate is called 'dominant' and the surface estate 'servient', not because the mineral estate is in some sense superior, but because it receives the benefit of the implied right of use of the surface estate." [29]

IV. How to Interpret an "Oil, Gas, and Other Minerals" Conveyance Concerning the Unspoken Ownership of Geothermal Energy and Associated Resources

Because of abundant oil and gas, Texas has a long history of parties severing real property into surface and mineral estates. By far, the most common phrase used to accomplish this severance is "oil, gas, and other minerals" when the parties convey or reserve those substances. Naturally, if the phrase "geothermal energy and associated resources" or similar terms are specifically expressed in a deed, conveyance, reservation, lease, or other legally binding document, then such a document would be clear and controlling, and the inquiry into ownership would be complete. Such language is likely to become more common in the future, but it is exceptionally uncommon in Texas property records currently. Accordingly, where real property has been severed into a surface and a mineral estate, the question whether geothermal energy and associated resources was included as part of the mineral or of the surface estate will be left to the courts — unless the Legislature decides to act — when attempting to ascertain the intent of the parties, and will most likely depend on the interpretation of the phrase "oil, gas, and other minerals."

A. Introduction. The Ownership of Any Real Property Interest in Texas is Determined by the Intent of the Parties to the Deed, Conveyance, Reservation, Lease, or other Legally Binding Document in Question

The ownership of any real property interest in Texas is determined by the intent of the parties to the deed, conveyance, reservation, lease, or other legally binding document. [30] In the absence of controlling language in an applicable document in the property records, courts follow established rules of construction to determine ownership of the real property interest in question. Texas has a long history of well-developed case law, as well as statutory law, for analyzing whether a property interest belongs to the surface or to the mineral estate. When the applicable documents are silent in Texas, pertinent

statutes, legal precedents, and rules of construction individually and collectively reach the same answer — geothermal energy and associated resources belong to the surface estate and not the mineral estate. Again, this is because heat, energy, steam, hot water, hot brines, and geopressured water are not minerals under Texas law.

B. Brief History of Mineral Ownership in Texas, the Texas Constitution, and Severance

Before addressing how to interpret an "oil, gas, and other minerals" conveyance, reservation, lease, or other document to determine the intent of the parties regarding geothermal energy and associated resources, it is helpful to review Texas history regarding the ownership and severance of minerals.

As explained by Williams and Haigh [31], "Private title to all land in Texas originates from a grant by the sovereign of the soil." Successively, the sovereigns were Spain, Mexico, the Republic of Texas, and the State of Texas. "Under the laws of Spain and Mexico, mines and their metals or minerals did not pass by the ordinary grant of the land without express words of designation. In one of the earliest acts of the Congress of the Republic of Texas, this rule was adopted, and it was continued in force after Texas became a state. Accordingly, a grantee of land before 1866 had no interest in the minerals in the land unless that interest was expressly granted." [32] Because the sovereign of Spain declared all minerals and mines to be sovereign property, the first severance of the surface estates and mineral estates in Texas actually began with an 18th century Spanish royal decree which declared that all minerals and mines in the "new Spain" to be property of the throne. [33] Additionally, because of this, the right to sever the mineral estate in Texas originates in Spanish law, which recognized that "a property may be acquired in mines which will be quite independent of the property in the lands in which they are situated." [34]

However, the State Constitution of 1866 changed the rule that private title to land does not include mines and their metals or minerals. This change was carried over in substantially the same language into the constitutions of 1869 and 1876. Pursuant to the new provision, the State released to "owners of soil" (commonly known today as "surface owners") all mines and mineral substances therein. [35] This constitutional provision had retrospective effect. Therefore, landowners (excluding Relinquishment Act lands) were given complete ownership of the minerals in all lands that passed from the sovereign before the effective date of the Constitution of 1876. [36]

The provision, adopted in 1866, read: "That the State of Texas hereby releases to the owner of the soil all mines and mineral substances, that may be on the same, subject to such uniform rate of taxation, as the Legislature may impose." The provision was re-adopted in substantially the same words as Section 9, Article IX of the Constitution of 1869 and as Section 7, Article XIV of the present Constitution of 1876. That provision and numerous other sections which were considered "deadwood" were repealed by ballot proposition in 1969.

Importantly, the provision in question did not define either "mines" nor "minerals" and it also did not define mineral estate nor surface estate. Therefore, it has been left to the courts and to the Legislature to interpret these terms and to provide clarity in various factual circumstances.

The phrase, "oil, gas, and other minerals" is the most widespread language found in Texas for severing the mineral and surface estates. This phrase and similar phrases are the subjects of numerous Texas Supreme Court and lower court decisions. Accordingly, we must engage in a review of Texas case law regarding the construction of documents in general and in particular of case law construing the phrase "oil, gas, and other minerals" and similar phrases to ascertain whether geothermal energy and associated resources are likely to be held to be a constituent of the surface or of the mineral estate in the absence of controlling language in a legally binding document.

C. In the Event of a Severance Between the Surface and Mineral Estates, the Intent of the Parties as Expressed Within the Four Corners of the Property Records Determines Ownership of Geothermal Energy and Associated Resources

When property records, such as deeds, conveyances, reservations, or mineral leases, dividing land into separate estates are unclear and disputes arise, courts must interpret the documents and rule on their meanings. Acts of the Legislature, such as the Property Code, the Natural Resources Code, the Water Code, The

Geothermal Resources Act of 1975, etc. may provide guidance to the courts in their quests to ascertain the most reasonable meaning of the parties. However, because the Legislature does not have the power to alter established private property rights, Texas courts pronounce judgments regarding private property rights by interpreting the documents and facts in evidence. Otherwise, private property rights may be established, recognized, or clarified through acts of the Legislature and through amendments to the Texas Constitution, as was established by the amendment in 1866 releasing all "mines and minerals" to the owner of the soil.

1. Oil, Gas, and Mineral Severances

Texas courthouse records are replete with mineral deeds which commonly grant or reserve interests in "oil, gas, and other minerals" (not to mention all of the oil, gas, and mineral leases which convey a fee simple determinable title to the oil, gas, and other minerals in place). [37] However, because these terms are rarely defined or described with sufficient particularity, it has been left to Texas courts to interpret their meaning.

Oil, gas, and mineral estates are accomplished by either a grantor reserving minerals or by a conveyance of minerals. In *Benge v. Scharbauer*, [38] the Texas Supreme Court stated: "It is well settled that the owners of land may reserve to themselves minerals or mineral rights, including the oil or any right or ownership therein. [39]

When the intent of the parties is unclear as to whether or not a particular substance or resource was conveyed by a document, the Texas Supreme Court has stated that the primary analysis for ascertaining the parties' intent is the Four Corners Rule. [40]

2. The Four Corners Rule

This is the umbrella rule of law which controls when interpreting a deed, conveyance, reservation, lease, or other legally binding document. Conveyances, exceptions, reservations, and even leases of oil, gas, and minerals are frequently unclear. The instruments are often silent regarding what specific substances, other than oil and gas, are included in the conveyance. To resolve these matters, the intent of the parties is to be determined first by considering the instrument as a whole and is known as the Four Corners Rule.

"The primary duty of the courts in interpreting a deed is to ascertain the intent of the parties. But it is the intent of the parties as expressed within the four corners of the instrument which controls." [41] "The intention of the parties to a deed is the paramount consideration, and their intention is to be gathered from a consideration of the entire instrument taken by its four corners." [42]

In an earlier case called *Garrett v. Dils Company*, the Texas Supreme Court explained what has become known as the Four Corners Rule as follows:

We shall be guided by the well-established rule which we recently reaffirmed in Harris v. Windsor, Tex., 294 S.W.2d 798, 799, 800, in this language: 'We have long since relaxed the strictness of the ancient rules for the construction of deeds, and have established the rule for the construction of deeds as for the construction of all contracts, - that the intention of the parties, when it can be ascertained from a consideration of all parts of the instrument, will be given effect when possible. That intention, when ascertained, prevails over arbitrary rules. *Benskin v. Barksdale, Tex.Com.App.*, 246 S.W. 360.; Sun Oil Co. v. Burns, 125 Tex. 549, 84 S.W.2d 442 (Tex. 1935)' [43]

The definitions of reservations and exceptions were stated in *Bagby v. Bredthauer*, 627 S.W.2d 190 (Tex.App.—Austin 1981, no writ) as follows:

Technically, a reservation is the creation, by and in behalf of the grantor, of a new right issuing out of the thing granted-something which did not exist as an independent right before the grant, a taking back of a part of the thing already granted. See *Coyne v. Butler*, 396 S. W .2d 474 (Tex.Civ .App.—Corpus Christi 1965, no writ). An exception operates to exclude from the grant some part of the thing granted which would otherwise pass to the grantee, with the whole of the thing granted. An exception does not itself pass title but rather prevents the particular excepted interest from passing with the grant. Title to the interest excepted remains in the grantor by virtue of his original title. In *Coyne v. Butler*, supra, the grantor "excepted" the interest in question from his grant. The court held that no new interest was created since no words of reservation were used in the instrument.

Additionally, in *Patrick v. Barrett*, 734 S.W.2d 646 (Tex. 1987) the Texas Supreme Court stated:

The keystone of this opinion is a clear understanding of the distinctions between an exception and a reservation. It is manifest that an exception does not pass title itself; instead it operates to prevent the excepted interest from passing at all. *Pich v. Lankford*, 157 Tex. 335, 339-40, 302 S.W.2d 645, 648 (1957). On the other hand, a reservation is made in favor of the grantor, wherein he reserves unto himself royalty interest, mineral rights and other rights. *Benge v. Scharbauer*, 152 Tex. 447, 451-52, 259 S.W.2d 166, 167-68 (1953).

In many cases, a conveyance or reservation of "oil, gas, and other minerals" occurred many decades ago, either when the mineral estate was first severed from the surface estate, or when an oil and gas lease that is still held by production was granted. As such, the typical severance document most likely is silent regarding the property interest called geothermal energy and associated resources. How then do we ascertain the intention of the parties from the four corners of the instrument?

When applying the Four Corners Rule – as mandated by the Texas Supreme Court – to a typical "oil, gas, and other minerals" conveyance, reservation, or mineral lease, when the document is silent regarding geothermal energy and associated resources, the obvious, reasonable, and logical conclusion to reach under the Four Corners Rule is that the parties evidenced no intent to include geothermal energy and associated resources, just as they did not include any other resource, substance, or property interest other than oil, gas, and other minerals (unless stated). Therefore, the geothermal energy and associated resources remain as property of the owner of the soil (i.e., the surface owner).

In other words, if there was a severance which conveyed the "oil, gas, and other minerals," but was silent regarding geothermal energy and associated resources, then under the Four Corners Rule, the geothermal energy and associated resources were not conveyed along with the "oil, gas, and other minerals." They were retained by the surface owner. Similarly, if the owner of the soil conveyed the surface of a property but reserved the "oil, gas, and other minerals," then the geothermal energy and associated resources were conveyed along with the rest of the surface estate not including the "oil, gas, and other minerals." Therefore, the Four Corners Rule establishes that the surface owner owns the geothermal energy and associated resources, absent a specifically spoken statement to the contrary in a controlling document. The same conclusion is also reached through application of the Retention Rule, discussed below.

D. Retention Rule - Following a Severance of Oil, Gas, and Other Minerals, the Surface Owner Retains Ownership of all Property Interests Except the Mineral Interests

In addition to the Four Corners Rule, there is a long line of cases specifically under Texas oil, gas, and mineral case law which establishes a rule of law that in the event of a severance of the surface and mineral estates, the surface owner owns all property interests — everything — left in the land except the severed mineral interests and their accompanying rights. This includes all non-mineral molecules, all geologic structures including empty space and the space in which the minerals are embedded. This also includes all resources other than the severed minerals such as geothermal energy and associated resources and any other resource. This article names this rule of law, the Retention Rule, because the rule establishes that the surface owner retains ownership of everything that was not severed.

As mentioned, the 1939 case called *Gulf Production Co. v. Continental Oil Co.* [44] featured a dispute between a surface owner lessor and the lessee of the oil, gas, and other minerals. Ruling in favor of the surface owner, the Texas Supreme Court held that the "surface, and **everything** in the land itself, except the minerals covered by the lease, was still in their possession (referring to the surface owner) and was their property, subject to a reasonable use, qualified only by the express provisions of the lease...." [45] Accordingly, the Texas Supreme Court established the rule that when there is a severance of oil, gas, and mineral interests (in this case, an "oil, gas, and other minerals" lease) from a surface owner's fee simple estate, that the surface owner retains ownership of everything except the specifically severed oil, gas, and other minerals and their accompanying interests.

This Retention Rule was carried forward by the United States Court of Claims in the leading case of *Emeny v. United States*. [46] In that case, the court was required to

apply Texas law to a property rights dispute between The United States government, as the lessee of certain oil and gas leases, and the surface owners of the tract overlying the leases. The United States contended that it had the right to store helium in a depleted natural gas reservoir, the same reservoir out of which the government had the rights to extract natural gas under the leases. The surface owners asserted that they owned the empty space in the depleted natural gas reservoir. Therefore, they argued, the United States had no right to such space, and any use of such space amounted to an unconstitutional taking without just compensation.

The Court in *Emeny* agreed with the surface owners stating, "the surface of the leased lands and ***everything*** in such lands, except the oil and gas deposits covered by the leases, were still the property of the respective landowners. Gulf Production Co. v. Continental Oil Co., supra, 132 S.W.2d at page 561. This included the geological structures beneath the surface, together with any such structure that might be suitable for the underground storage of 'foreign' or 'extraneous' gas produced elsewhere." [47]

Citing with approval the decision in *Emeny*, the Texas Supreme Court reaffirmed this rule of law that the surface owner of a tract with a severed mineral interest owns everything except the mineral interest and accompanying rights. Specifically construing a severance of royalties on oil, gas, and other minerals, the Court stated that the ownership of the surface "includes not only the surface ... but also the matrix of the underlying earth..." [48]

More recently, in 2017, in a case called *Lightning v. Anadarko* [49], the Texas Supreme Court cited with approval all of the foregoing decisions and expanded on them. In Lightning, the Court stated, "the surface owner, and not the mineral owner, owns all non-mineral 'molecules' of the land, i.e., the mass that undergirds the surface estate." [50] The Court continued, "there is a distinction between the earth surrounding hydrocarbons and earth embedded with hydrocarbons." [51] Continuing, the Texas Supreme Court quoted with approval a statement from the lower court that "ownership of the hydrocarbons does not give the mineral owner ownership of the earth surrounding those substances." [52] This distinction illustrates that while severed mineral interests may be owned by the mineral party, the surface owner owns *everything else* except that which has been severed. Finally, the Court emphasized "we agree that the surface owner owns and controls the mass of earth undergirding the surface." [53]

Accordingly, the Texas Supreme Court and the other cases establish a Retention Rule that when there is a severance of the surface and mineral estates in Texas, the surface owner retains ownership of *everything* — all property interests without limitation — except the severed minerals and their accompanying rights. In other words, everything in the original parcel of land from which an "oil, gas, and other minerals" conveyance is severed remains the property of the original parcel of land, i.e., the surface estate. This includes ownership of all non-mineral molecules of the land, ownership of the mass of earth undergirding the surface, and even ownership of empty space within the earth. Therefore, it follows beyond any reasonable dispute, that such ownership includes any heat and energy which are properties of those very same molecules contained within "the mass of earth undergirding the surface." [54]

E. Texas Law Regarding How to Interpret the Phrase "Oil, Gas, and Other Minerals" with Respect to "Geothermal Energy and Associated Resources"

Even though the Four Corners Rule and the Retention Rule appear to resolve the inquiry, certain advocates may argue that the phrase "other minerals" should be interpreted so as to include geothermal energy and associated resources. Therefore, if not satisfied that the Four Corners Rule and the Retention Rule conclusively answer the question, we can follow Texas statutes and established Texas Supreme Court precedents regarding how to interpret the phrase "other minerals."

The Texas Legislature has adopted a statutory definition of the term "mineral" and a statutory definition of the term "geothermal energy and associated resources." These two definitions are separate, distinct, and irreconcilable. Pursuant to the express definitions, geothermal energy and associated resources are not minerals. Additionally, the Texas Supreme Court has provided three tests to apply to factual circumstances regarding conveyances or reservations of "oil, gas, and other minerals" which specifically direct us how to analyze the phrase "other minerals." Application of these tests also leads to the

conclusion that geothermal energy and associated resources are not minerals.

1. Texas Statutory Definitions of "Geothermal Energy and Associated Resources" and "Mineral"

   a. Geothermal Energy and Associated Resources [55]

To begin our analysis, it is insightful to observe that the Texas statutory definition of "geothermal energy and associated resources" contains the following two subsets:

(1) tangible substances -- "*steam, hot water and hot brines, and geopressured water.*" [56]; and

(2) intangible qualities or properties of the earth itself -- **"heat or other associated energy."** [57]

All of the tangible substances — **"steam, hot water and hot brines, and geopressured water"** — belong to the surface estate as a matter of law in Texas because they are all forms of groundwater. Groundwater, including saltwater brines, have been ruled by both the Texas Supreme Court as well as the Texas Legislature to be owned by the surface estate as a matter of law in Texas (absent a controlling conveyance or reservation to the contrary). [58]

"Heat" and **"other associated energy"** are not substances. As established by science as well as Texas law, [59] oil, gas, and other minerals are all substances. By contrast, "heat" is "energy that is transferred from one body to another as the result of a difference in temperature." [60] "Energy" means "the capacity for doing work." [61] Oil, gas, and other minerals are all tangible substances. Heat and energy are not substances. Heat and energy are intangible qualities or properties of the earth itself and, thus, are definitively not minerals.

   b. Mineral

The Texas Statutory Definition of "Mineral" excludes "Geothermal Energy and Associated Resources." The Texas Property Code defines mineral as follows:

"Mineral" means oil, gas, uranium, sulphur, lignite, coal, and any other substance that is ordinarily and naturally considered a mineral in this state, regardless of the depth at which the oil, gas, uranium, sulphur, lignite, coal, or other substance is found. [62]

As is readily apparent, "geothermal energy and associated resources" do not fit within the definition of "mineral." To reiterate, all of the tangible substances listed in the definition of "geothermal energy and associated resources" are all forms of groundwater, and are not minerals. Additionally, they all belong to the surface estate as a matter of law. Heat and energy are intangible properties of the earth. Heat and energy are not minerals.

Moreover, once substances such as oil, gas, and other minerals are extracted from the subsurface, they are *gone* (unless replaced). Minerals are exhaustible. Geothermal heat and energy radiate from the earth itself and remain properties of the earth itself even when developed and utilized as a resource.

Thus, even though geothermal heat and energy can be used for the production of electricity and other forms of energy, the heat and energy derived from the earth, for all intents and purposes of humanity, is essentially inexhaustible. Therefore, heat and energy are not minerals. Consequently, unless the heat and the energy or some other portion of the geothermal resources were specifically conveyed in a controlling document, geothermal energy and associated resources remain property interests of the surface estate.

Finally, the Texas Legislature has adopted two distinct definitions because "minerals" and "geothermal energy and associated resources" are two different and distinct types of resources. The two statutory definitions are separate, distinct, and irreconcilable. The definition of "mineral" cannot be read so as to include "geothermal energy and associated resources" and "geothermal energy and associated resources" cannot be read so as to include "minerals."

2. Rules of Construction Prescribed by the Texas Supreme Court for Determining if a Substance Is or Is Not a Mineral

If not convinced by the Four Corners Rule, nor by the Retention Rule, nor by the distinctions between the statutory definition of "mineral" in relation to the statutory definition of "geothermal energy and associated resources," there are three tests prescribed by the Texas Supreme Court specifically to address the phrase "other minerals" and to determine whether a substance is or is not a mineral, as intended by the parties. These tests are summarized as follows:

The surface-destruction test (applicable to conveyances prior to June 8, 1983); Acker v. Guinn, 464 S.W.2d 348 (Tex. 1971); Reed v. Wylie II, 597 S.W.2d 743 (Tex. 1980).

Substances that belong to the surface estate as a matter of law test; Moser v. United States Steel Corp., 676 S.W.2d 99 (Tex. 1984). In *Moser*, the Court replaced the surface-destruction test with a list of substances that belong to the surface estate as a matter of law; and

The ordinary-and-natural-meaning test. Additionally, in the *Moser* case, the Court adopted the ordinary-and-natural-meaning test when determining whether a substance is or is not a mineral. *Id.*

a. The Surface-Destruction Test

This test was first pronounced by the Texas Supreme Court in *Acker v. Guinn*, 464 S.W.2d 348 (Tex. 1971) and adjusted in a line of cases before being fully expressed in *Reed v. Wylie II*, 597 S.W.2d 743 (Tex. 1980). The Surface-Destruction Test does not determine what substances are and are not minerals. Rather, it was a way for the Texas Supreme Court to protect landowners from the effects of their own documents by creating a theory that if the surface had to be destroyed to mine the minerals, the minerals belonged to the surface owner. Under this test, the Court ruled that substances located within three or four feet belonged to the surface estate owner as a matter of law. Substances within 200 feet of the surface belonged to the surface estate owner if any reasonable method of extracting the substance would destroy the surface.

Under this test, one might conclude that geothermal energy and associated resources do not belong to the surface estate (unless the geothermal resources are located within three or feet of the surface, or within 200 feet of the surface and destruction of the surface is reasonable to produce them). However, the surface-destruction test does not provide guidance for determining which substances are or are not minerals. It only determines which substances belong to the surface owner as a matter of law. Therefore, as stated by Smith and Weaver in *Texas Law of Oil and Gas*, "Hence, if an instrument was executed prior to June 8, 1983, and there is controversy over ownership of a substance that is too deep to have been extracted by surface-destructive methods and that is not surface-owned as a matter of law, the controversy will be resolved through application of the ordinary-and-natural meaning test." Smith and Weaver, *Texas Law of Oil and Gas* at 3.6(B)(1) (2020). Accordingly, the surface-destruction test is not applicable in determining whether parties to an oil, gas, and minerals conveyance intended to include geothermal energy and associated resources in the conveyance or reservation. The Surface-Destruction Test is potentially applicable only if the geothermal energy and associated resources are located within three to four feet of the surface or within 200 feet of the surface and destruction of the surface is necessary to produce them. However, at this time, even if the geothermal energy and associated resources are located within 200 feet of the surface, it is highly unlikely that destruction of the surface would be necessary to access and to produce them as an energy source.

b. Surface-Owned as a Matter of Law Test

Prior to *Moser v. United States Steel Corp.*, 676 S.W.2d 99 (Tex. 1984), there was a long line of Texas Supreme Court decisions and lower court decisions where the courts held that certain substances belonged to the surface estate. In the *Moser* decision, the Texas Supreme Court reaffirmed many of those previous decisions and announced that they belong to the surface estate as a matter of law. Accordingly, when ascertaining whether a substance was included as part of an oil, gas, and other minerals conveyance, we look to see if the substance is on the list as belonging to the surface owner as a matter of law.

(i) The List of Substances Belonging to the Surface Estate as a Matter of Law

In *Moser* (and other cases as noted) the Texas Supreme Court established that the following substances belong to the surface estate as a matter of law:

1. Fresh water;
2. Saltwater [63];
3. Building stone;
4. Limestone;
5. Caliche;
6. Surface Shale;
7. Sand;
8. Gravel; and
9. Near-surface lignite, iron, and coal. [64]

Reviewing the list, we find that water and saltwater are on the list of substances which belong to the surface estate as a matter of law. [65] Therefore, as discussed, because they are all forms of water or saltwater, we can definitively conclude that the following substances listed in the Texas statutory definition of geothermal energy and associated resources belong to the surface estate (absent a controlling document to the contrary) as a matter of law: **steam, hot water and hot brines, and geopressured water.**

Continuing our review of the list, we see that **heat** and **energy** are not included on the list. For the reasons discussed above, heat and energy should not be considered to be minerals. However, this is a discussion of the three rules of construction prescribed by the Texas Supreme Court for how to analyze the term "mineral," so we will move on to the next test. Having determined that the surface-destruction test is not applicable and having determined that neither heat nor energy has been held to be part of the surface estate as a matter of law, we proceed to the ordinary-and-natural-meaning test to address whether parties to an "oil, gas, and other minerals" conveyance intended for heat and energy to be included in the conveyance or reserved as part of the surface estate.

c. The Ordinary-and-Natural-Meaning Test

The ordinary-and-natural-meaning test found in *Moser* is applicable for conveyances after June 8, 1983, and for previous conveyances if the intent of the parties is unclear or unspoken, and the "substance" in question is too deep to be determined by the surface-destruction test. This test is to be applied if the "substance" in question has not previously been held to belong to the surface estate as a matter of law, if the intent of the parties to the "oil, gas, and other minerals" conveyance is unclear, and if it is necessary to determine if the "substance" in question (such as geothermal resources) is or is not a mineral.

This test was announced by the Texas Supreme Court in the leading case of *Moser* following its listing of substances which belong to the surface estate as a matter of law. [66] The Court articulated the test as follows:

"We now hold a severance of minerals in an oil, gas and other minerals clause includes all substances within the ordinary and natural meaning of that word, whether their presence or value is known at the time of severance." [67]

As illustrated previously, the Texas Property Code defines all minerals as substances. [68] The ordinary and natural meaning test also classifies minerals as substances. [69] As established, **"heat"** and **"associated energy"** are not substances. They are properties or qualities of the earth itself. They are resources but they are not substances. Therefore, **"heat"** and **"associated energy"** are not minerals under the ordinary and natural meaning test because they are not substances.

In conclusion, all of the substances listed in the definition of "geothermal energy and associated resources" belong to the surface estate as a matter of law because they are all forms of groundwater. **"Heat"** and **"associated energy"** belong to the surface estate because they are not minerals and, thus, were not included in a conveyance or reservation of "oil, gas, and other minerals."

V. Application of Texas Law to the Texas Definition of Geothermal Energy and Associated Resources Subsection by Subsection

To wrap up, it is useful to analyze the Texas definition of geothermal energy and associated resources by breaking it down, subsection by subsection.

For ease of reference, once again the Texas Geothermal Resources Act defines "geothermal energy and associated resources" as:

(A) products of geothermal processes, embracing indigenous steam, hot water and hot brines, and geopressured water;

(B) steam and other gasses, hot water and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations;

(C) heat or other associated energy found in geothermal formations; and

(D) any by-product derived from them. Tex. Nat. Res. Code § 141.003(4).

"By-product" is defined as "any other element found in a geothermal formation which is brought to the surface, whether or not it is used in geothermal heat or pressure inducing energy generation." Tex. Nat. Res. Code § 141.003(5).

Subsection (A). As established, the substances listed in subsection (A) are all forms of groundwater. The Texas Supreme Court as well as the Legislature both declare that groundwater, including saltwater brines, belong to the surface estate as a matter of law. [70]

Section 36.001(5) of the Texas Water Code, defines groundwater as "water percolating below the surface of the earth." This begs the question whether "indigenous steam, hot water and hot brines, and geopressured water" are "percolating." It would require geologic and hydrologic experts to investigate and to examine whether specific "indigenous steam, hot water and hot brines, and geopressured water" in question are or are not percolating. However, even if such steam, water, brine, or geopressured water is trapped and not percolating, that does not lead to the conclusion that they are minerals or otherwise belong to the mineral estate. To the contrary, as discussed, Texas law establishes that most forms of water, including brines, belong to the surface estate as a matter of law [71] (excluding produced water which is geologically entrained in an oil or gas reservoir and defined under Texas law as waste). [72]

Subsection (B). Everything listed in this subsection refers to substances which result from fluids or gas artificially injected into geothermal formations. Therefore, they would belong to the person performing the injection assuming the injection was conducted lawfully. The phrase "steam and other gasses" is modified by the phrase "resulting from water, gas, or other fluids artificially introduced into geothermal formations." Accordingly, "other gasses" cannot be read as referring to naturally existing mineral gasses, such as hydrocarbons, as sometimes inferred by other readers.

Subsection (C). This subsection lists, **"heat or other associated energy found in geothermal formations."** As established, heat and energy are not substances as are minerals. Heat and energy are properties of the earth. Heat and energy are not minerals.

Subsection (D). This final subsection lists **"any by-product derived from them." "Them"** refers to the first three subsections. This is critical because the first three subsections, as discussed, do not include any minerals. Therefore, any by-product derived from non-minerals would also be a non-mineral. It strains reason that any by-product derived from non-minerals could transmute its fundamental nature and somehow become a mineral. Therefore, subsection (D) should not be read as including any substances that are minerals.

However, it is acknowledged that **"By-product"** is defined as **"any other element found in a geothermal formation which is brought to the surface, whether or not it is used in geothermal heat or pressure inducing energy generation."** [73] If it were not for the fact that subsection (D) specifically lists **"any by-product derived from them,"** [74] this would be problematic because "by-product" by itself was given an all-inclusive definition otherwise applicable to any and every element brought to the surface from a geothermal formation. In such a case, a court would need to analyze each particular element individually to determine whether it is or is not a mineral. For example, any oil or natural gasses brought to the surface from a geothermal formation should be ruled to be minerals.

Nonetheless, "by-product" by itself was not included in the definition of geothermal energy and associated resources. Instead, the Legislature narrowed the scope of the otherwise expansive term, "by-product" when they included it in Subsection (D) and modified it with "derived from them." "By-product derived from them" is much more circumspect than "by-product." This is because the full phrase narrows the scope of all potential by-products to only those derived from the items listed in Subsections (A)-(C), all of which are non-minerals. Accordingly, any by-product derived from a non-mineral should also be a non-mineral.

Finally, just as the Legislature does not possess the legal authority to alter established property rights by providing that geothermal energy and associated resources belong to the mineral estate, neither does the Legislature have the authority to provide that any minerals found in a geothermal formation belong to the surface estate. [75] Therefore, the most reasonable conclusion is that the Texas Legislature did not intend for the meaning of "by-product derived from them" to include any substances which actually are minerals. This is evident because the Legislature narrowed the scope of all potential by-products to only by-products derived from non-minerals. [76] In any event, the inclusion of any minerals in the definition of geothermal energy and associated resources likely would be ruled unconstitutional. [77]

VI. Caveat

It is always imperative to review the specific controlling documents such as deeds, conveyances, reservations, and leases in the property records. This is because, as discussed, it is the intent of the parties to the deed, conveyance, reservation, lease, or other legally binding document in question which controls. It is possible that specific facts and language in applicable documents may evidence an intent to convey some or all of the geothermal energy and associated resources to someone other than the surface owner. However, when the applicable documents are silent, geothermal energy and associated resources should be held as belonging to the surface estate and not the mineral estate in Texas.

VII. Conclusion

Heat, energy, steam, hot water, hot brines, and geopressured water are not minerals under Texas law. Therefore, in the event of a severance of the mineral estate from the surface estate in Texas, geothermal energy and associated resources should be held as belonging to the surface estate, absent a controlling document to the contrary which specifically conveys the geothermal energy and associated resources or some portion thereof to the mineral estate.

There are five reasons for this outcome:

- The Four Corners Rule establishes that there never was an intent evidenced in the property records to convey the geothermal energy and associated resources from the surface estate to the mineral estate;
- The Retention Rule establishes that all property interests, including geothermal energy and associated resources, are retained by the surface estate except the severed mineral interests and their accompanying rights;
- Texas statutes establish separate, distinct, and irreconcilable definitions of "mineral" and "geothermal energy and associated resources" and the definition of the latter simply does not fit within the definition of the former;
- The tangible resources (steam, hot water and hot brines, and geopressured water,) contained in the definition of geothermal energy and associated resources all belong to the surface estate as a matter of Texas law because they are all forms of groundwater; and
- The remaining intangible resources (heat and energy) contained in the definition of geothermal energy and associated resources belong to the surface estate under Texas law because they are not minerals for the reason that they are qualities or properties of the earth undergirding the surface.

Conflict of Interest Disclosure

Ben Sebree serves as General Counsel for The Texas Geothermal Energy Alliance, a 501(c)(6) organization that works on issues within the subject matter of this Report, and is compensated for this work. Additionally, he is the founding member of The Sebree Law Firm PLLC which represents clients who are active in the geothermal industry and the oil and gas industry, as well as land and mineral owners, who have interests in the subject matter of this Report. Outside of these roles, Ben Sebree certifies that he has no affiliations, including board memberships, stock ownership, and/or equity interest, in any organization or entity with a financial interest in the contents of this manuscript, and has no personal or familial relationship with anyone having such an affiliation or financial interest.

Chapter 14 References

[1] Tex. Nat. Res. Code § 141.002(5). See discussion in Section II.B., infra.

[2] Altman v. Blake, 712 S.W. 2d 117, 118 (Tex. 1986).

[3] Id. City of Stamford v. King, 144 S.W.2d 923 (Tex.Civ.App. Eastland 1940, writ ref'd).

[4] Gulf Production Co. v. Continental Oil Co. 132 S.W 2nd 553, 561 (Tex. 1939), Emeny v. United States, 412 F.2d 1319, 1323 (1969), Humble Oil & Refining Co. v. West, 508 S.W.2d 812, 815 (Tex. 1974). Dunn-McCampbell Royalty Interest, Inc. v. Nat'l Park Serv., 630 F.3d 431, 441 (5th Cir. 2011), Springer Ranch, Ltd. v. Jones, 421 S.W.3d 273, 283 (Tex. App. - San Antonio 2013, no pet.), Lightning Oil Co. v. Anadarko E & P Onshore LLC, 480 S.W.3d, 628, 635 (Tex. App. - San Antonio 2015) aff'd, 520 S.W.3d 39 (Tex. 2017), Lightning Oil Co. v. Anadarko E & P Onshore LLC, 520 S.W.3d 39 (Tex. 2017). See discussion at Section V, infra.

[5] Id.

[6] Id.

[7]Gulf Production Co. v. Continental Oil Co. 132 S.W 2nd 553, 561 (Tex. 1939), Emeny v. United States, 412 F.2d 1319, 1323 (1969), Humble Oil & Refining Co. v. West, 508 S.W.2d 812, 815 (Tex. 1974). Dunn-McCampbell Royalty Interest, Inc. v. Nat'l Park Serv., 630 F.3d 431, 441 (5th Cir. 2011), Springer Ranch, Ltd. v. Jones, 421 S.W.3d 273, 283 (Tex. App. - San Antonio 2013, no pet.), Lightning Oil Co. v. Anadarko E & P Onshore LLC, 480 S.W.3d, 628, 635 (Tex. App. - San Antonio 2015) aff'd, 520 S.W.3d 39 (Tex. 2017), Lightning Oil Co. v. Anadarko E & P Onshore LLC, 520 S.W.3d 39 (Tex. 2017). See discussion at Section V, infra.

[8] Tex. Prop. Code § 75.001.

[9] Tex. Nat. Res. Code § 141.003. See Section II.A., infra. for full definition of "geothermal energy and associated resources."

[10] Moser v. United States Steel Corp. 676 S.W.2d 99, 102 (Tex. 1984). See also Edwards Aquifer Auth. v. Day, 369 S.W.3d 814, 832 (Tex. 2012); Tex. Water Code Ann. § 36.002.; Sun Oil Co. v. Whitaker, 483 S.W.2d 808, 811 (Tex.1972); Fleming Foundation v. Texaco, Inc., 337 S.W.2d 846, 852 (Tex.Civ. App.1960, writ ref'd, n.r.e.) and Robinson v. Robbins Petroleum Corp., 501 S.W.2d 865 (Tex. 1973).

[11] Moser at 102.

[12] Tex. Nat. Res. Code § 141.003. "Any by-product derived from them" addressed separately in Section VI, infra.

[13] Tex. Prop. Code § 75.001; Moser at 102.

[14] Tex. Nat. Res. Code § 141.001 et. seq.

[15] Id. at § 141.011.

[16] Id. at § 141.071.

[17] Id. at § 141.003(4).

[18] Id. § 141.003(5).

[19] Id.at § 141.002(4)(emphasis added).

[20] Id. at § 141.002(5).

[21] U.S. Const. Amend. V applied to the states through U.S. Const. Amend XIV; Tex. Const. Art. I. § 17.

[22] Tex. Property Code § 5.001.

[23] Id.

[24] See Dolan v. City of Tigard 512 U.S. 374, 384, 393 (1994), Kaiser Aetna v. United States, 444 U. S. 164, 176 (1979), U.S. v. General Motors Corp., 323 U.S. 373, 378, (1945) ("property" denotes the group of rights "to possess, use, and dispose of it") Severance v. Patterson, 370 S.W.3d 705, (Tex. 2012), Lightning v. Anadarko, 520 S.W.3d 39, 49 (Tex. 2017).

[25] See Tex. Constitution of 1869. Art. IX. § 9 and Tex. Constitution of 1876. Art. XIV. § 7.

[26] "'As a rule, parties have the right to contract as they see fit as long as their agreement does not violate the law or public policy.'…" Coyote Lake Ranch, LLC v. City of Lubbock, 498 S.W.3rd 53, 59 (Tex. 2016) quoting In re Prudential Ins. Co. of Am., 148 S.W.3d 124, 129 (Tex.2004) citing Sonny Arnold, Inc. v. Sentry Sav. Ass'n, 633 S.W.2d 811, 815 (Tex.1982) (recognizing 'the parties' right to contract with regard to their property as they see fit, so long as the contract does not offend public policy and is not illegal'…").

[27] Gulf Production Co. v. Continental Oil Co. 132 S.W 2nd 553, 561 (Tex. 1939), Emeny v. United States, 412 F.2d 1319, 1323 (1969), Humble Oil & Refining Co. v. West, 508 S.W.2d 812, 815 (Tex. 1974). Dunn-McCampbell Royalty Interest, Inc. v. Nat'l Park Serv., 630 F.3d 431, 441 (5th Cir. 2011), Springer Ranch, Ltd. v. Jones, 421 S.W.3d 273, 283 (Tex. App. - San Antonio 2013, no pet.), Lightning Oil Co. v. Anadarko E & P Onshore LLC, 480 S.W.3d, 628, 635 (Tex. App. - San Antonio 2015) aff'd, 520 S.W.3d 39 (Tex. 2017), Lightning Oil Co. v. Anadarko E & P Onshore LLC, 520 S.W.3d 39 (Tex. 2017). See discussion at Section V, infra.

[28] Gulf Production Co. v. Continental Oil Co. 132 S.W 2nd 553, 561 (Tex. 1939).

[29] Coyote Lake Ranch, LLC v. City of Lubbock, 498 S.W.3d 53, 60 (Tex. 2016); see also Acker v. Guinn, 464 S.W.2d 348, 352 (Tex. 1971) and Restatement (Third) of Prop.: Servitudes § 1.1(1) (Am. Law Inst.1998) ("A servitude is a legal device that creates a right or an obligation that runs with land or an interest in land. (a) Running with land means that the right or obligation passes automatically to successive owners or occupiers of the land or the interest in land with which the right or obligation runs. (b) A right that runs with land is called a 'benefit' and the interest in land with which it runs may be called the 'benefited' or 'dominant' estate. (c) An obligation that runs with land is called a 'burden' and the interest in land with which it runs may be called the 'burdened' or 'servient' estate.").

[30] Altman v. Blake, 712 S.W. 2d 117, 118 (Tex. 1986).

[31] Williams and Haigh, Mineral Rights and Royalties in Texas, Texas State Historical Association, http://www.tshaonline.org/handbook/entries/mineral-rights-and-royalties (last accessed November 24, 2022).

[32] Id.

[33] See Walace Hawkins, El Sal Del Ray, 7–15 (Austin, Tex. State Historical Ass'n. 1947) (providing a detailed history of the royal mining ordinances and their impact on the development of Texas mineral law).

[34] Cowan v. Hardeman, 26 Tex. 217, 223 (1862) (quoting John A. Rockwell, a Compilation of Spanish and Mexican Law, in Relation to Mines, and Titles to Real Estate, in Force in California, Texas and New Mexico 580 (New York, John S. Voorhies 1851)).

[35] Williams and Haigh, Mineral Rights and Royalties in Texas, Texas State Historical Association, http://www.tshaonline.org/handbook/entries/mineral-rights-and-royalties (last accessed November 24, 2022).

[36] Id.

[37] Stephens County v. Mid-Kansas Oil & Gas Co., 113 Tex. 160, 254 S.W. 290 (1923).

[38] 259 S.W.2d 166 (Tex. 1953).

[39] Id. at 166-167 citing Humphreys-Mexia Co. v. Gammon, 113 Tex. 247, 254 S.W. 296; 29 A.L.R. 607; Hoffman v. Magnolia Petroleum Co., Tex.Com. App., 273 S.W. 828(4); Watkins v. Slaughter, supra; Curry v. Texas Company, Tex.Civ.App., 18 S.W.2d 256, writ dismissed; 31-A T.J. 64, Sec. 32, and authorities therein cited.

[40] Altman v. Blake, 712 S.W. 2d 117, 118 (Tex. 1986).

[41] Altman v. Blake, 712 S.W. 2d 117, 118 (Tex. 1986). See also, e.g. Garrett v. Dils Company., 299 S.W.2d 904, 906 (Tex. 1957); Luckel v. White, 819 S.W.2d 459, 461 (Tex. 1991); JVA Operating Co. v. Kaiser-Francis Oil Co., 11 S.W.3rd 504, 506 (Tex. App.-Eastland 2000).

[42] City of Stamford v. King, 144 S.W.2d 923 (Tex.Civ.App. Eastland 1940, writ ref'd).

[43] Garrett v. Dils Company., 299 S.W.2d 904, 906 (Tex. 1957).

[44] 132 S.W 2nd 553 (Tex. 1939).

[45] Id. at 561 (emphasis added).

[46] 412 F.2d 1319 (1969).

[47] Id. at 1323 (emphasis added).

[48] Humble Oil & Refining Co. v. West, 508 S.W.2d 812, 815 (Tex. 1974).

[49] 520 S.W.3d 39 (Tex. 2017).

[50] Id. at 46 and 48 (quoting Dunn–McCampbell Royalty Interest, Inc. v. Nat'l Park Serv., 630 F.3d 431, 441 (5th Cir. 2011)).

[51] Id. at 47.

[52] Id. at 48 quoting Lightning Oil Co. v. Anadarko E & P Onshore LLC, 480 S.W.3d, 628, 635 (Tex. App. - San Antonio 2015) aff'd, 520 S.W.3d 39 (Tex. 2017) (quoting Springer Ranch, Ltd. v. Jones, 421 S.W.3d 273, 283 (Tex. App. — San Antonio 2013, no pet.)).

[53] Lightning, 520 S.W.3d 39, 47 (Tex. 2017).

[54] Id.

[55] Entire definition reprinted at Section II., supra. and Section VI., infra.

[56] Tex. Nat. Res. Code § 141.003(4)(A).

[57] Tex. Nat. Res. Code § 141.003(4)(C). "Any by-product derived from them" addressed separately in Section VI., infra.

[58] The Texas Supreme Court established in multiple holdings that water belongs to the surface estate, absent a controlling document to the contrary. "Water, unsevered expressly by conveyance or reservation, has been held to be a part of the surface estate." Sun Oil Co. v. Whitaker, 483 S.W.2d 808, 811 (Tex.1972) (citing Fleming Foundation v. Texaco, Inc., 337 S.W.2d 846 (Tex.Civ.App.1960, writ ref'd, n.r.e.). Additionally, the Texas Supreme Court ruled that fresh water belongs to the surface estate as "a matter of law." Moser v. United States Steel Corp., 676 S.W.2d 99, 101-102 (Tex. 1984). The Texas Supreme Court also ruled that salt water belongs to the surface estate. Robinson v. Robbins Petroleum Corp., 501 S.W.2d 865, 873 (Tex. 1973). The Texas Legislature adopted a law which expressly recognizes "that a landowner owns the groundwater below the surface of the landowner's land as real property." Tex. Water Code § 36.002(a). Finally, the Texas Supreme Court in Edwards Aquifer Auth. v. Day, 369 S.W.3d 814 (Tex. 2012) explained that the ownership of groundwater in place is a perfected property right in Texas. Quoting a previous Texas Supreme Court decision which restated the law regarding ownership of oil and gas in place, the Texas Supreme Court in Day held, "The [groundwater] beneath the soil [is] considered a part of the realty. Each owner of land owns separately, distinctly and exclusively all [groundwater] under his land and is accorded the usual remedies against trespassers who appropriate the [groundwater] or destroy their market value." Id. at 832 quoting Elliff v. Texon Drilling Co, 210 S.W.2d 558, 561 (Tex. 1949).

[59] Tex. Prop. Code § 75.001.

[60] https://www.britannica.com/science/heat (last accessed November 12, 2022).

[61] https://www.britannica.com/science/energy (last accessed November 12, 2022).

[62] Tex. Prop. Code § 75.001.

[63] Saltwater (brine) was not included on the list in the Moser decision. However, the Texas Supreme Court in other decisions specifically included saltwater (brine) as belonging to the surface estate absent a controlling document to the contrary. Robinson v. Robbins Petroleum Corp., 501 S.W.2d 865, 873 (Tex. 1973). See also Sun Oil Co. v. Whitaker, 483 S.W.2d 808, 811 (Tex.1972) (not limiting "water" to "fresh water.").

[64] Moser. at 101-102.

[65] See also Edwards Aquifer Auth. v. Day, 369 S.W.3d 814, 832 (Tex. 2012); Tex. Water Code Ann. § 36.002. See also Moser v. United States Steel Corp. 676 S.W.2d 99, 102 (Tex. 1984); Sun Oil Co. v. Whitaker, 483 S.W.2d 808, 811 (Tex.1972); Fleming Foundation v. Texaco, Inc., 337 S.W.2d 846, 852 (Tex.Civ. App.1960, writ ref'd, n.r.e.) and Robinson v. Robbins Petroleum Corp., 501 S.W.2d 865, 873 (Tex. 1973).

[66] Moser at 99.

[67] Id. at 102.

[68] Tex. Prop. Code § 75.001.

[69] Moser at 102.

[70] Edwards Aquifer Auth. v. Day, 369 S.W.3d 814, 832 (Tex. 2012); Tex. Water Code Ann. § 36.002. See also Moser v. United States Steel Corp. 676 S.W.2d 99, 102 (Tex. 1984); Sun Oil Co. v. Whitaker, 483 S.W.2d 808, 811 (Tex.1972); Fleming Foundation v. Texaco, Inc., 337 S.W.2d 846, 852 (Tex.Civ. App.1960, writ ref'd, n.r.e.) and Robinson v. Robbins Petroleum Corp., 501 S.W.2d 865 (Tex. 1973).

[71] Id.

[72] Tex. Water Code § 27.002(6); Tex. Nat. Res. Code § 91.1011; and Tex. Nat. Res. Code § 122.001(2). See Sebree and Cusimano, Texas Law of Produced Water Ownership, 38th Annual Advanced Oil, Gas, and Energy Resources Law Course, Chapter 2, Sponsored by the State Bar of Texas, Houston, September 24-25, 2020

[73] Tex. Nat. Res. Code § 141.003(5).

[74] Tex. Nat. Res. Code § 141.003(4)(D) (emphasis added).

[75] U.S. Const. Amend. V applied to the states through U.S. Const. Amend XIV; Tex. Const. Art. I. § 17.

[76] Tex. Nat. Res. Code § 141.003(4)(D).

[77] U.S. Const. Amend. V applied to the states through U.S. Const. Amend XIV; Tex. Const. Art. I. § 17.