

Subsurface “Trespass”: A Man’s Subsurface Is Not His Castle

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[The] maxim—cujus est solum ejus est usque ad coelum et ad inferos—“has no place in the modern world.” . . . Lord Coke, who pronounced the maxim, did not consider the possibility of airplanes. But neither did he imagine oil wells. The law of trespass need no more be the same two miles below the surface than two miles above.¹

I. INTRODUCTION

The title to my essay and the epigraph above state both my thesis and conclusion regarding an invasion of another’s deep subsurface that causes no actual harm. To grasp my essential argument, no further reading is necessary. But, those who need convincing or those who are just curious may wish to continue.

The First Restatement of Property provides that “‘property’ . . . denote[s] legal relations between persons with respect to a thing.”² The “thing” considered in this article is the subsurface of real property, and the precise focus is on subsurface trespass. While the right to exclude trespassers is a fundamental incident of property “ownership,”³ this right, like other incidents, is not and should not be absolute. I submit that the right to exclude trespassers from the subsurface of real property should be much more limited: Whenever the trespasser’s subsurface intrusion accomplishes an important societal need, including private commercial needs, and so long as the subsurface owner suffers no actual and substantial damages, subsurface trespass should not be actionable.⁴ Stated conversely, while a person has a duty not to enter the subsurface property of another without the owner’s permission, this duty should not be absolute, absent proof of actual and substantial damages. More-

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1. Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1, 11 (Tex. 2008) (footnotes omitted) (citing *United States v. Causby*, 328 U.S. 256, 260-61 (1946)).

2. RESTATEMENT (FIRST) OF PROP.: INTRODUCTORY NOTE (1936).

3. See *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 435 (1982).

4. I realize that some courts may permit nominal damages in such cases, which is harmless, provided no injunctive relief is given.

over, and most importantly, an invasion that causes no actual harm should not be subject to injunctive relief.

Although I only briefly discuss airspace trespass cases, I am arguing, in essence, that trespass law respecting the subsurface should be similar to trespass law respecting airspace. In so doing, I recognize that, except for flights by aircraft, the Second Restatement of Torts makes no express distinction between surface, subsurface, and airspace trespasses.⁵ I also acknowledge that the “solid” subsurface seems more akin to surface than airspace, and while subsurface invasions often have a more permanent presence than an airplane flying through airspace, courts should be guided by case law dealing with airspace trespass when deciding subsurface trespass disputes.

Critics may counter that certain types of deep subsurface invasions should not be within trespass law at all, but that such invasions should be left to the law of nuisance and negligence.⁶ I am reluctant to go this far. Regarding nuisance, my reluctance is best expressed in the famous passage from *Prosser and Keeton on Torts*. “There is perhaps no more impenetrable jungle in the entire law than that which surrounds the word ‘nuisance.’”⁷ Moreover, in some jurisdictions, “artificial” barriers to a nuisance action may bar recovery even though a landowner has suffered substantial damages—for example, in North Dakota, an activity expressly authorized by law is not a nuisance.⁸ When no such barriers exist, nuisance law has the desirable built-in flexibility to resolve many land-use disputes. But when one intentionally injects a substance that physically invades the subsurface of a neighboring landowner, money damages should be recoverable for any actual and substantial damage caused without having to engage in the uncertainty of balancing whether the gravity of harm to the landowner outweighs the utility of the defendant’s conduct.

I am also reluctant to limit subsurface trespass to situations in which the trespassing injector is negligent. If a subsurface invasion causes actual and substantial damages, proof of negligence should not be required. Of course, negligent conduct that results in actual damages to neighboring land should be recoverable when all the elements of negligence are proven.

While I would preserve the availability of a trespass action for sub-

5. RESTATEMENT (SECOND) OF TORTS § 159 (1965) provides:

(1) Except as stated in Subsection (2), a trespass may be committed on, beneath, or above the surface of the earth.

(2) Flight by aircraft in the air space above the land of another is a trespass if, but only if,

(a) it enters into the immediate reaches of the air space next to the land, and

(b) it interferes substantially with the other’s use and enjoyment of his land.

6. See *Garza*, 268 S.W.3d at 30 (Willet, J., concurring).

7. W. PAGE KEETON ET AL., PROSSER AND KEETON ON TORTS § 86 (5th ed. 1984).

8. See, e.g., N.D. CENT. CODE § 42-01-12 (2009).

surface invasions, I would do so in a limited way—one that requires proof of actual and substantial damages, not mere theoretical or speculative harm.⁹ Thus, I would not allow recovery for loss of speculative value in a subsurface trespass action. Of course, the most serious threat to subsurface trespass is the possibility of injunctive relief or ejectment.¹⁰ I would not allow injunctive relief or ejectment for subsurface trespass unless the harm to a neighboring landowner clearly outweighs the utility of the subsurface invasion. For instance, when a freshwater supply is being displaced or polluted, or when injected substances leach out of what is supposed to be a confined reservoir, causing serious pollution of the surface¹¹ or subsurface that cannot otherwise be stopped and remediated, injunctive relief or ejectment may be appropriate. Thus, a mineral owner should have a right to enjoin subsurface trespass only when necessary to allow for the diligent extraction of minerals that are actually and economically recoverable and that would otherwise be displaced or become unrecoverable as a result of the subsurface invasion. Such situations should be rare and may not arise at all if the subsurface injection project is subject to a robust regulatory permitting system whose purpose, in part, should be to prevent these situations from arising in the first place. In general, whether a particular subsurface invasion should be prohibited or stopped should be left to environmental regulatory agencies, not to courts. I would also bar punitive damages if the injector who causes actual and substantial damages acts in compliance with the terms of a regulatory permit.

In circumstances where a landowner or mineral owner suffers actual and substantial subsurface damages,¹² a court should be allowed to award damages for trespass while denying injunctive relief or eject-

9. Thus, I reject the holding in *Grynberg v. City of Northglenn*, 739 P.2d 230 (Colo. 1987), in which testing of the subsurface by the surface owner’s permittee, which revealed that the property had no recoverable coal reserves, caused speculative-value loss to the coal lessee. I also reject the implicit holding in *Marengo Cave Co. v. Ross*, 10 N.E.2d 917, 921 (Ind. 1937), in which the use by an adjacent landowner of a portion of a cave that lied beneath neighboring land would be an actionable trespass, because “[a]t no time were [plaintiffs] aware that any one was trespassing upon their land.”

10. See, e.g., *Gregg v. Delhi-Taylor Oil Corp.*, 344 S.W.2d 411 (Tex. 1961) (involving a suit to enjoin hydraulic fracturing on subsurface-trespass grounds).

11. If the injected substances leached out at the surface or polluted soil, subsoil, or usable water on neighboring property, such a trespass would become a surface trespass and should be subject to an “ordinary” trespass claim. See, e.g., *Mowrer v. Ashland Oil & Ref. Co.*, 518 F.2d 659 (7th Cir. 1975) (finding private nuisance when oil seeped out of wellheads as a result of waterflooding operations conducted on nearby land); *Starrh & Starrh Cotton Growers v. Aera Energy L.L.C.*, 63 Cal. Rptr. 3d 165 (Ct. App. 2007) (describing how wastewater from oil well percolated from pit and migrated to neighboring land, causing degradation of water, which if returned to its natural state had some potential value for irrigating certain salt-tolerant crops); *Bloomingdales, Inc. v. N.Y. City Transit Auth.*, 915 N.E.2d 608 (N.Y. 2009) (finding a cause of action in subsurface trespass activity that caused flooding of retail store).

12. Because I would require a showing of actual and substantial subsurface damages, a plaintiff would have to show much more than a mere possibility of trespass. Cf. *Williams v. Cont’l Oil Co.*, 14 F.R.D. 58 (W.D. Okla. 1953). In other words, merely establishing a subsurface intrusion is insufficient. See, e.g., *Vill. of DePue v. Viacom Int’l, Inc.*, Nos. 08-cv-1272, 08-cv-1273, 2009 WL 1841582, at *9 (C.D. Ill. June 25, 2009).

ment.¹³ The measure of damages should ordinarily be the sum of money that represents the decline in value of the owner's interest as a result of the trespass, even though the trespass may be a continuing one. Recovery of remediation costs should be left to regulatory law to assure that such costs are actually spent on remediation.

A land or mineral owner should not be permitted to recover money damages for mere loss of speculative value resulting from a subsurface trespass. In other words, a mineral owner should have to show that its ability to recover actual mineral resources has been substantially impeded either because the minerals have been displaced or because the injections have made recovery of the minerals impossible or more expensive. Moreover, any damage award should be discounted by the costs of mineral extraction.

Because I would not hold the trespasser liable for a subsurface trespass that causes no actual and substantial damages, the statute of limitations should begin to run when the landowner knows or should have known about the actual damages.¹⁴ In the case of an ongoing invasion of neighboring land, such a trespass would be continuing in nature and would constitute a continuing series of successive injuries with the statute of limitations beginning anew for each series, subject to equitable defenses such as estoppel and laches.¹⁵ In general, I would not allow a subsurface trespasser to acquire prescriptive rights.¹⁶

Because I argue that some subsurface invasions should be privileged, perhaps I should not call the intruding parties "trespassers." For convenience, however, I will use this label throughout the duration of this article to identify the intruding party.¹⁷ In essence, absent actual and substantial damages, such an intruder may be viewed as committing a "technical" but not an "actionable" trespass.

Unless the context indicates otherwise, when I refer to a subsurface trespasser, I am referring to a party that is lawfully engaged in activities

13. To this limited extent, my trespass proposal is similar to nuisance cases in which damages are awarded but injunctions are denied. *See, e.g.,* *Boomer v. Atl. Cement Co.*, 257 N.E.2d 870 (N.Y. 1970) (awarding damages for nuisance but denying an injunction when the external costs of the defendant's conduct were suffered largely by a few neighboring landowners and the defendant's conduct provided a societal benefit).

14. *But see Starrh*, 63 Cal. Rptr. 3d at 170-71 (stating that the statute of limitations for a permanent trespass commences at the time of entry); *DBMS Invs., L.P. v. ExxonMobil Corp.*, No. 13-08-00449-CV., 2009 WL 1974646 (Tex. App. June 11, 2009) (stating that the statute of limitations runs from the date of trespass because subsurface contamination is not inherently undiscoverable).

15. *See, e.g., Starrh*, 63 Cal. Rptr. 3d at 170-71. However, even in the case of a continuing trespass, a landowner may be barred from asserting a cause of action if he fails to act with reasonable diligence to discover the trespass. *McNay v. Gateway Coal Co.*, 11 Pa. D. & C.4th 456 (Ct. Com. Pl. 1991) (dealing with alleged impairment of potable water by nearby coal mining operations).

16. *Cf. Hinman v. Pac. Air Lines Transp. Corp.*, 84 F.2d 755, 759 (9th Cir. 1936) (observing that prescriptive airspace rights may not be obtained).

17. *See Burt v. Beautiful Savior Lutheran Church of Broomfield*, 809 P.2d 1064, 1067 (Colo. App. 1990) (stating "trespass is the physical intrusion upon property of another without the permission of the person lawfully entitled to the possession of the real estate").

vis-à-vis both the surface and subsurface of the land where that party is conducting the surface activities but where those activities result in a physical invasion of the subsurface of neighboring land. Thus, as to neighboring land, the entity is, strictly speaking, a subsurface trespasser under the common-law *ad coelum* doctrine.¹⁸ However, I argue that such a trespass should not be actionable unless the neighboring landowner suffers actual and substantial damages. Moreover, as previously stated, I further argue that injunctive relief or ejectment should not ordinarily be available.

II. THE ANCIENT HISTORY OF TRESPASS

Historically, trespass denoted a series of actions for harm to person or property.¹⁹ While a trespass action often resulted in strict liability, the remedy was a flexible one, designed to provide appropriate relief for wrongs that were often not easily pigeon-holed into established actions.²⁰ Although scholars have hypothesized on the precise origin of trespass, the answer of how trespass came to be remains unclear.²¹

18. The full doctrine is “*cujus est solum ejus est usque ad coelum et ad inferos*” (“whoever owns the soil owns everything up to the sky and down to the depths”). BLACK’S LAW DICTIONARY 1834 (9th ed. 2009).

19. Professor Anderson thanks Ashleigh Boggs, University of Oklahoma College of Law Class of 2009, for her research assistance in the preparation of this section.

20. 9 RICHARD R. POWELL, POWELL ON REAL PROPERTY § 64A.01[1]-[2] (Michael Allen Wolf ed., 2000).

21. Scholars have offered four theories on the origins of trespass: One theory, summarized by Plucknett and credited to Oliver Wendell Holmes Jr., is that the action in trespass derived from the common law appeal of felony. 9 POWELL, *supra* note 20, § 64A.01[1] (citing T. PLUCKNETT, A CONCISE HISTORY OF THE COMMON LAW 366-72 (5th ed. 1956)). Historically, the appeal of a felony did not provide for the recovery of stolen property by the complainant. Thus, an action in trespass developed to allow for the recovery of the monetary value of the stolen property. Plucknett states:

If trespass developed from the appeal, then the changes must have been these: first, where the stolen goods were no longer forthcoming, the plaintiff in trespass is now able to recover their money value from the defendant; this seems to have been impossible by the appeal. Secondly, words of felony must be omitted; this was already optional in an appeal which could thus be changed from a criminal into a civil action.

T. PLUCKNETT, A CONCISE HISTORY OF THE COMMON LAW 330 (2d ed. 1936). Plucknett further states that these events “naturally” led to the development of trespass actions. *Id.*

In his article, *The Origins of the Action of Trespass*, George Woodbine argues that the trespass action derived from the *assize of novel disseisin*. 9 POWELL, *supra* note 20, § 64A.01[1] (citing George Woodbine, *The Origins of the Action of Trespass*, 34 YALE L.J. 343, 357 (1925)). *Assize of novel disseisin* was an action that allowed the plaintiff to recover possession of “disseised” property, or property that had been wrongfully taken. *Id.* However, because plaintiffs could *only* recover possession, they began to file writs of trespass to recover monetary damages, often a preferable remedy. *Id.* Thus, the trespass action developed *in conjunction with* the *assize of novel disseisin*, in which trespass allowed monetary damages and *assize of novel disseisin* allowed recovery of possession. *Id.*

A third theory on the origin of the trespass action is that it was predated by civil suits for damages and, thus, arose subsequently as a specialized form of damage suit. 9 POWELL, *supra* note 20, § 64A.01[1] (citing 1 SEDGWICK, DAMAGES § 7 (9th ed. 1912)). This theory has much in common with Woodbine’s theory, the difference being that this theory suggests trespass as an action to recover monetary damages that arose *subsequent to and as a result of* the development of actions to recover possession of the property.

The fourth theory is that trespass originated in the Court of King’s Bench as an action to remedy a breach of the king’s peace (a criminal proceeding) and developed into an action providing a civil remedy for individuals. *Id.* (citing George Woodbine, 33 YALE L.J. 799, 800 (1924); S.F.C. Milson, *Trespass from Henry III to Edward III*, 74 L.Q. REV. 195, 222 (1958)). Powell’s commentary on

Before the Norman invasion of 1066 A.D., England was divided into shires, and each shire had its own court and law.²² When William the Conqueror claimed England by conquest, a single set of laws was developed and was imposed on all of England, making the law “common.”²³ This common legal regime led to a system of king’s courts: King’s Bench, Common Pleas, and Exchequer.²⁴ Traditionally, these courts enforced favorable judgments by taking the losing defendant’s property to satisfy the plaintiff’s claim.²⁵ As the system further evolved, if this legal remedy was inadequate, then the claimant, in particular circumstances, could apply to the Lord Chancellor for equitable relief.²⁶

An important limitation on access to the king’s courts was that a claimant had to obtain a writ—a written command, directing the sheriff to give the defendant notice of the claim and to bring any defendant not voluntarily remedying the claim before the court.²⁷ Writs were highly technical, affording a particular remedy for a very specific harm. If the pleading did not contain the precise wording of the writ or allege the particular type of harm, the writ was denied. In other words: “If a plaintiff failed to find a pigeon hole for his specific injury, there was no recourse under the writ system.”²⁸ The writ of trespass was no exception.

Originally, the writ of trespass was not limited to wrongs relating to personal or real property but also included various types of personal injuries.²⁹ “A litigant used the writ of trespass in early England ‘to show that he had sustained a physical contact on his person or property, due to the activity of another.’”³⁰ The trespass writ became popular because it was among the first to allow the recovery of money damages.³¹

Over time, the writ of trespass evolved into a number of forms.³²

this theory states:

The later development of the action in trespass indicates a *gradual shift* from using it as a criminal proceeding to correct wrongs against the king’s peace to employing it as a civil remedy for individuals. This shift is evidenced by a decline in verdicts resulting in fines and imprisonment and an increase in verdicts providing monetary damages for injury to persons or property.

Id. (emphasis added) (citing George F. Deiser, *The Development of Principle in Trespass*, 27 YALE L.J. 220, 225 (1917); Woodbine, *supra*, at 344. As trespass shifted from a predominately criminal action to a civil action, courts began exercising more discretion over the size and type of verdicts, showing a shift from the fines and penalties of criminal actions to more flexible measures of damage to fit the particularized harm to the claimant in a civil action. *Id.*

22. PAGE S. JACKSON, FLORIDA CIVIL PRACTICE BEFORE TRIAL § 27.2 (8th ed. 2009).

23. *Id.*

24. *Id.*

25. *Id.*

26. *Id.*

27. *Id.*

28. Michael L. Rustad & Thomas H. Koenig, *Taming the Tort Monster: The American Civil Justice System as a Battleground of Social Theory*, 68 BROOK. L. REV. 1, 11 (2002).

29. 9 POWELL, *supra* note 20, § 64A.01[1] (citing PROSSER & KEETON ON TORTS, *supra* note 7, § 6, at 29 (5th ed. 1984)).

30. Rustad & Koenig, *supra* note 28, at 10 (citing Charles O. Gregory, *Trespass to Negligence to Absolute Liability*, 37 VA. L. REV. 359, 361-62 (1951)).

31. 9 POWELL, *supra* note 20, § 64A.01[1] (citing PROSSER & KEETON, *supra* note 7, at 29).

32. Rustad & Koenig, *supra* note 28, at 11 (citing Gregory, *supra* note 30, at 363).

In general, trespass writs fell into two broad categories: specific classes of wrongs that fell within established writs of trespass and wrongs that could not be pigeon-holed into a specific category.³³ Among the most important established trespass writs, generally involving direct harm to the plaintiff, were:

Trespass *vi et armis* (“with force and arms”): trespass to the person, including assault and battery.³⁴

Trespass *de bonis asportatis* (“trespass for carrying goods away”): trespass to chattels.³⁵

Trespass *quare clausum fregit* (“why he broke the close”): trespass to real property.³⁶

As the writs of trespass further evolved, a subclass of trespass *quare clausum fregit* developed, known as trespass *de ejectione firmæ*.³⁷ During the early days of this ejection writ, the remedy was limited to the recovery of money damages, consistent with its origin as a branch of the writ of trespass, and was primarily available to lessees who had been wrongfully dispossessed.³⁸ But ejection later evolved to allow recovery of possession as well as money damages and became more generally available to anyone wrongfully dispossessed.³⁹

If the wrong did not fit into one of the defined categories or did not directly injure the claimant, an action was brought for “trespass on the case.”⁴⁰ “Case” developed through the thirteenth and fourteenth centuries as it became clear that the existing writs failed to redress all types of injuries, including those involving indirect injuries.⁴¹ Trespass on the case became a catch-all trespass writ. For example, case is used today by trespass claimants who suffer injury to non-possessory interests in property.⁴²

In summary, trespass comprises a series of writs that together offer appropriate and flexible relief based upon particular circumstances. Trespass is a wrong that should continue to evolve to meet the needs of modern society, including more extensive subsurface land use.

III. AIRSPACE TRESPASS LAW

The most ubiquitous use of airspace is by airplanes. Airplane tres-

33. *Id.*

34. BLACK’S, *supra* note 18, at 1643.

35. *Id.*

36. *Id.*

37. F.W. MAITLAND, *MEDIAEVAL SOURCEBOOK: THE FORMS OF ACTION AT COMMON LAW* (1909), available at <http://www.fordham.edu/halsall/basis/maitland-formsofaction.html>. For a helpful flow chart, see J.H. BAKER, *AN INTRODUCTION TO ENGLISH LEGAL HISTORY* 83 (3d ed. 1990).

38. MAITLAND, *supra* note 37; PLUCKNETT, *supra* note 21, at 334-35.

39. MAITLAND, *supra* note 37.

40. *Id.*; PLUCKNETT, *supra* note 21, at 335.

41. Rustad & Koenig, *supra* note 28, at 11.

42. *See, e.g., Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1, 9-11 (Tex. 2008).

pass cases have universally rejected a strict adherence to the *ad coelum* doctrine. In general, the use of airspace by airplanes is not actionable, unless a landowner suffers actual damages.⁴³

In *Hinman v. Pacific Air Lines Transport Corp.*,⁴⁴ the court observed that the *ad coelum* doctrine⁴⁵ had been:

[I]nvented at some remote time in the past when the use of space above land actual or conceivable was confined to narrow limits, and simply meant that the owner of the land could use the overlying space to such an extent as he was able, and that no one could ever interfere with that use.⁴⁶

The court further observed that the doctrine was “never taken literally, but was a figurative phrase to express the full and complete ownership of land and the right to whatever superjacent airspace was necessary or convenient to the enjoyment of the land. . . . Title to the airspace unconnected with the use of land is inconceivable.”⁴⁷ The court then reasoned that any use of airspace that actually injures the land or interferes with its possession or beneficial use would be a trespass, but “any claim of the landowner beyond this cannot find precedent in law, nor support in reason.”⁴⁸ The court further reasoned that a stricter rule would mean that “any use of airspace . . . without [landowner] consent would be a trespass either by the operator of an airplane or a radio operator. We will not foist any such chimerical concept of property rights upon the jurisprudence of this country.”⁴⁹ The court concluded that “traversing the airspace above appellants’ land is not, of itself, a trespass at all, but it is a lawful act unless it is done under circumstances which will cause injury to appellants’ possession.”⁵⁰ The court then held that the plaintiffs “do not, therefore, in their bill state a case of trespass, unless they allege a case of actual and substantial damage.”⁵¹ Because the plaintiffs had not shown actual damages, the court denied both money damages and injunctive relief.⁵² Regarding the plaintiffs’ concern that the defendants’ continuous use of airspace would ripen into an easement by prescription, the court held that a prescriptive easement in airspace cannot be acquired.⁵³ In a later case, *United States v. Causby*,⁵⁴

43. See, e.g., *United States v. Causby*, 328 U.S. 256 (1946) (recognizing that airplanes may freely navigate airspace unless the flights are so low and constant as to make it impossible for the true owner to reside upon or farm the land); *Hinman v. Pac. Air Lines Transp. Corp.*, 84 F.2d 755, 758-59 (9th Cir. 1936) (holding that the use of airspace is not unlawful without proof of actual injury).

44. 84 F.2d 755 (9th Cir. 1936).

45. See *supra* note 18 for a full description of the doctrine.

46. *Hinman*, 84 F.2d at 757.

47. *Id.* (responding to plaintiffs’ argument that they were entitled to absolute title to all airspace to such height as may become useful but no less than 150 feet).

48. *Id.* at 758.

49. *Id.*

50. *Id.* at 758-59.

51. *Id.* at 759.

52. *Id.*

53. *Id.*

54. 328 U.S. 256 (1946).

the United States Supreme Court found that the particular use of airspace by military aircraft caused actual and substantial damages to a chicken farmer and was found to be a taking.⁵⁵

A somewhat stricter view of airspace trespass arises in “overhang” situations—when a trespasser constructs an improvement or plants a tree that intrudes into the airspace of neighboring land.⁵⁶ Such encroachments generally are not necessary to meet an important societal or private commercial need. Moreover, these encroachments are often into airspace that is close to the surface and, therefore, akin to a surface invasion. Thus, in the case of trees, the invaded landowner may trim the branches or demand their periodic removal back to the property line, regardless of whether the landowner suffers any actual harm.⁵⁷ Nevertheless, injunctive relief may be denied when a trespassing overhang causes no actual harm to the plaintiff landowner.⁵⁸

IV. THE STATE OF EXISTING SUBSURFACE TRESPASS LAW

My argument is that subsurface trespass claims should be limited to situations in which the subsurface owner, who may also own the surface, suffers actual and substantial damages in the use and enjoyment of his land. Absent actual and substantial damages, I would deny relief. Much of the existing subsurface trespass law supports my argument, but overall, case law is neither unified nor coherent, and language in a handful of cases suggests that subsurface owners may have greater rights to exclude. I have grouped the case law by particular subsurface uses, as the type of use often influences the actual issue put before the court and, thus, the outcome of the case. In other words, the concerns or immediate objective of the invaded owner often depends on the particular context, which has led to a lack of cohesion under case law.

I have previously written that, in most jurisdictions, title to subsurface pore spaces rests with the surface owner, not the mineral owners.⁵⁹ I will not repeat that argument here. However, for purposes of this essay, I will assume the surface owners generally hold title to pore spaces but that mineral owners, like surface owners, have a right to be protected against a subsurface trespass that causes them actual and substantial damages regarding their right of subsurface use, which includes the right to use pore spaces in the extraction of minerals.

55. *Id.* at 265.

56. *See, e.g.*, *Geragosian v. Union Realty Co.*, 193 N.E. 726 (Mass. 1935) (addressing an overhanging fire escape).

57. *See, e.g.*, *Jones v. Wagner*, 624 A.2d 166 (Pa. Super. Ct. 1993).

58. *Geragosian*, 193 N.E. at 728.

59. *See* Owen L. Anderson, *Geologic CO₂ Sequestration: Who Owns the Pore Space?*, 9 WYO. L. REV. 97 (2009).

A. Traditional Oil and Gas Trespass Cases

The most obvious example of a *non*-trespass occurs when an operator drills a directional or horizontal oil or gas well beneath a neighboring tract that is included within a drilling unit for that well.⁶⁰ This example does not support my argument; however, because establishment of the unit, coupled with the fact that all interest owners will share in any resulting production, makes such use privileged.

In the context of oil and gas development, the most obvious example of actionable trespass is the drilling of a directional well that bottoms out beneath neighboring property that is not part of the drilling unit for that well.⁶¹ This type of trespass should remain actionable because the trespass is not necessary for the exploitation of oil and gas resources because a non-trespassing well could be drilled to exploit the same resources.

In a directional trespass action, the plaintiff will often assert and prove bad-faith conversion of oil and gas, which ordinarily achieves a higher recovery than a claim for trespass damages.⁶² Because of the rule of capture, the oil and gas converted by the trespasser is generally held to be 100% of the production, even though some of the oil and gas may have been drained from beneath the trespasser's own land.⁶³ In addition to money damages, such a trespass may be enjoined in appropriate circumstances.⁶⁴

The actual measure of damages for conversion is either the net value or gross value of the converted minerals or hydrocarbons.⁶⁵ If the court finds that the trespass was committed in good faith—the trespasser reasonably believed that he was not trespassing—the court will limit the award of damages to net value by allowing the trespasser to deduct the costs of mining or drilling and production in the course of accounting to the rightful owner for the conversion.⁶⁶ The ability to deduct costs, however, also depends on whether the mining or hydrocarbon production was economically beneficial to the true owner.⁶⁷ In lieu

60. See, e.g., *Nunez v. Wainoco Oil & Gas Co.*, 488 So.2d 955, 964 (La. 1986); *Kysar v. Amoco Prod. Co.*, 93 P.3d 1272 (N.M. 2004); *Cont'l Res. v. Farrar Oil Co.*, 559 N.W.2d 841, 846 (N.D. 1997).

61. See, e.g., *Alphonzo E. Bell Corp. v. Bell View Oil Syndicate*, 76 P.2d 167 (Cal. Ct. App. 1938). In the context of hard minerals, mining beneath another's property constitutes a similar trespass. See, e.g., *Del Monte Mining & Milling Co. v. Last Chance Mining & Milling Co.*, 171 U.S. 55 (1898). English cases treated mining beneath another's property as fraud. See, e.g., *Dean v. Thwaite*, (1855) 21 Beav. 621; *Ecclesiastical Comm'rs for Eng. v. North E. Ry. Co.*, (1877) 4 Ch.D. 845 (V.C.M.); *Hilton v. Woods*, (1867) 4 L.R.Eq. 440 (V.C.M.); *Livingston v. Rawyards*, (1880) 5 App.Cas. 34 (H.L.); *Trotter v. McLean*, (1879) 13 Ch.D. 585.

62. See, e.g., *Pan Am. Petrol. Corp. v. Long*, 340 F.2d 211 (5th Cir. 1964).

63. See, e.g., *Edwards v. Lachman*, 534 P.2d 670 (Okla. 1974). In *Gribben v. Carpenter*, 185 A. 712 (Pa. 1936), the court awarded damages for the full value of all gas produced and commingled from a trespass well and from a lawful well.

64. See, e.g., *Hastings Oil Co. v. Texas Co.*, 234 S.W.2d 389 (Tex. 1950).

65. See, e.g., *Wronski v. Sun Oil Co.*, 279 N.W.2d 564 (Mich. Ct. App. 1979).

66. See, e.g., *Rudy v. Ellis*, 236 S.W.2d 466 (Ky. 1951).

67. See, e.g., *Edwards*, 534 P.2d at 675.

of net profits, a few decisions have compensated the true owner in the form of royalty,⁶⁸ which seems appropriate when the prevailing royalty exceeds the amount of the net profits.

On the other hand, if the court finds that the trespass was committed in bad faith,⁶⁹ or if the true owner did not economically benefit from mining or hydrocarbon production, the court will award the gross value of the converted minerals or hydrocarbons without allowing the trespasser to deduct costs.⁷⁰ Such a remedy serves as a form of punitive damages.⁷¹ Additionally, if prices are volatile, a bad-faith trespasser may be required to account for gross value at the highest market value between the time of conversion and trial.⁷²

If a directional trespasser drills a dry hole, most courts would likely allow recovery for any resulting devaluation of the land caused by the dry hole.⁷³ While this allows for the recovery of damages for lost speculative value, this result is justified because in the typical situation a directional invasion is neither necessary nor reasonable and is seldom inadvertent.

Courts have also allowed people who suffer direct seismic trespass to waive the trespass and sue in assumpsit.⁷⁴ Troublesome dictum in one case suggests that people who suffer indirect⁷⁵ seismic trespass may have a cause of action.⁷⁶ Fortunately, the efficacy of this dictum can now be seriously questioned in light of *Coastal Oil & Gas Corp. v. Garza Energy Trust*,⁷⁷ which held that hydraulic fracturing that encroaches into nearby property and results in drainage of hydrocarbons is not actionable because the drainage is protected by the rule of capture.⁷⁸ In addition, two cases involving alleged seismic trespass seem to support the proposition that no actionable trespass occurs when the seismic surveyor makes no physical entry onto the plaintiff’s property.⁷⁹ I have

68. See, e.g., *Alaska Placer Co. v. Lee*, 553 P.2d 54 (Alaska 1976).

69. In some states, willful trespass is presumed, and this presumption must then be overcome by evidence of good faith. See, e.g., *Rudy*, 236 S.W.2d at 468.

70. See, e.g., *Mayfield v. Benavides*, 693 S.W.2d 500 (Tex. App. 1985).

71. See, e.g., *Wronski v. Sun Oil Co.*, 279 N.W.2d 564 (Mich. Ct. App. 1979).

72. See, e.g., *Probst v. Bearman*, 183 P. 886 (Okla. 1919).

73. Cf. *Matheson v. Placid Oil Co.*, 33 So. 2d 527 (La. 1947) (dealing with surface and subsurface trespass and vertical drilling); *Humble Oil & Ref. Co. v. Kishi*, 276 S.W. 190 (Tex. Comm’n App. 1925) (same). But see *Martel v. Hall Oil Co.*, 253 P. 862 (Wyo. 1927) (denying damages when a trespasser drilled a dry hole).

74. *Phillips Petroleum Co. v. Cowden*, 241 F.2d 586 (5th Cir. 1957).

75. By “indirect,” I mean the acquisition of useful seismic information relating to a parcel of land that is acquired solely from seismic operations that are otherwise lawfully conducted from nearby lands.

76. See *Kennedy v. Gen. Geophysical, Co.*, 213 S.W.2d 707 (Tex. Civ. App. 1948).

77. 268 S.W.3d 1 (Tex. 2008).

78. *Id.* at 13-15.

79. See *Villarreal v. Grant Geophysical, Inc.*, 136 S.W.3d 265, 270 (Tex. App. 2004) (“There is no dispute . . . that [in conducting a 3-D seismic survey] neither Grant nor Millennium physically invaded or injured the surface estate lying above the Villarreal’s mineral estate; thus, there was no trespass.”). In *Ohio Oil Co. v. Sharp*, 135 F.2d 303 (10th Cir. 1943), Judge Phillips noted:

I do not think that a geological investigation of a substantial area, conducted upon lands

previously argued in commentary that pre-dates *Garza*, that both the gathering of seismic information from nearby lands without permission of the land or mineral owner and hydraulic fracturing that invades neighboring land should be protected by the rule of capture.⁸⁰

B. Subsurface Trespass Resulting from Hydraulic Fracturing

Garza is the most recent case to shed light on the topic of subsurface trespass. In this case, the Texas Supreme Court held that a subsurface invasion by a hydraulic fracturing operation was not an actionable trespass because the resulting damages—the drainage of hydrocarbons—was protected by the rule of capture.⁸¹ I have previously written that this holding was a good public-policy decision.⁸² In response to the concern that hydraulic fracturing was not regulated through a permitting process, the court reasoned that it should not usurp the lawful authority of the Texas Railroad Commission to decide to regulate, or not to regulate, fracturing.⁸³ Justice Willett, concurring, would have gone further and held that, not only was fracturing not an actionable trespass, it was “no trespass at all.”⁸⁴ His concurring opinion discusses energy security and the necessity of hydraulic fracturing for hydrocarbon recovery.⁸⁵

Garza does not directly support my argument because the court grounded its decision in the rule of capture. In other words, the court essentially ruled that the landowners suffered no *legally* recoverable injury due to the rule of capture, which does not apply to physical invasions that do not involve the capture and production of valuable fluids or information from nearby lands. Although the plaintiffs were harmed as a result of increased drainage caused by the fracturing operations, their claim for drainage was not actionable because the rule of capture shielded the draining party from liability as a matter of law.⁸⁶

The court reached this decision even though the jury found that a

rightfully entered, constitutes a trespass . . . although it may disclose geological information with respect thereto. To hold otherwise would greatly impede geological investigations . . . essential to the discovery and development of oil and gas.

Id. at 310 (Phillips, J., concurring).

80. See Owen L. Anderson & John D. Pigott, *3D Seismic Technology: Its Uses, Limits, & Legal Ramifications*, 42 ROCKY MTN. MIN. L. INST. 16-1, 16-111 to 16-117 (1996) (discussing seismic information); Bruce M. Kramer & Owen L. Anderson, *The Rule of Capture—An Oil and Gas Perspective*, 35 ENVTL. L. 899, 933-36 (2005) (discussing hydraulic fracturing). Both of these articles predate the *Garza* decision.

81. *Id.* at 13-15. In *People's Gas Co. v. Tyner*, 31 N.E. 59 (Ind. 1892), the Indiana Supreme Court held that the analogous technique of shooting a well to prime recovery was protected by the rule of capture, but also subject to the law of nuisance when the shooting, which was done with nitroglycerin, posed a danger to a densely populated area.

82. Owen L. Anderson, *Subsurface Trespass After Coastal v. Garza*, 60 INST. ON OIL & GAS L. & TAX'N 65, 97-104 (2009).

83. *Garza*, 268 S.W.3d at 14-15.

84. *Id.* at 29 (Willett, J., concurring).

85. *Id.* at 26-29.

86. *Id.* at 14.

subsurface trespass occurred as a result of the defendant’s injection of fluid and proppants beneath the plaintiffs’ subsurface.⁸⁷ The court tried to explain away this invasion by reasoning that the drained oil had actually been captured in the wellbore beneath the defendant’s land and not by the fractures.⁸⁸ Fortunately, the court offered a more convincing public-policy reason for its decision: that hydraulic fracturing prevented underground waste of hydrocarbons by allowing its recovery from tight reservoirs that would not otherwise be productive.⁸⁹ Thus, hydraulic fracturing was necessary to meet an important societal need.

Garza indirectly supports my thesis, however, because the court offered no sympathy to plaintiffs for subsurface trespass that causes no actual recoverable damage. The court suggested that it might grant trespass relief if the plaintiffs could show other harm, such as damage to wellbores on their property.⁹⁰ The logic of the court’s decision is: (1) yes, there was a subsurface invasion; (2) the subsurface invasion may have caused substantial drainage of hydrocarbons from beneath the invaded property; and (3) the rule of capture barred recovery for this drainage.⁹¹ Thus, actual recoverable damage was an essential element for relief.⁹²

In terms of the broader subject of subsurface trespass, the most important statement in *Garza* is the court’s observation that “[t]he law of trespass need no more be the same two miles below the surface than two miles above.”⁹³ Regarding the subsurface trespass issue in *Garza*, the court wisely protected the well-established and necessary practice of hydraulic fracturing from trespass claims that do not cause recoverable subsurface damage to nearby properties—apart from the possible drainage of hydrocarbons, which is privileged under the rule of capture.

C. Subsurface Trespass Resulting from Horizontal Drilling and Unlawful Pooling

A potentially troublesome case for horizontal subsurface trespass-

87. *Id.* at 8.

88. *Id.* at 14.

89. *Id.* at 16-17.

90. *Id.* at 17.

91. *See generally id.*

92. *Id.* at 11. The court began its analysis by finding that, because the cause of action was filed by a lessor, the proper action lay in trespass on the case for harm to lessor’s reversion, rather than in trespass *quare clausem fregit*, which could have been brought by the holder of a present possessory interest. *Id.* at 9-11. The court held that the lessor had standing to sue for trespass on the case, but the court further held that this action required a showing of actual damage. *Id.* at 11. This should not be read as implying that the holder of a present possessory interest would not be required to show actual damages to enjoin hydraulic fracturing; however, the court did suggest that the holder of a possessory interest may be entitled to recover nominal damages. *Id.* The prospect of nominal damages for subsurface trespass does not threaten valuable subsurface uses, but injunctive relief certainly would.

93. *Id.*

ers is *Browning Oil Co. v. Luecke*.⁹⁴ Here the lessors, collectively called the Lueckes, executed three leases covering three tracts, reserving a 1/8th royalty in each lease.⁹⁵ Each lease also contained a pooling clause empowering the lessee to pool the leased acreage on the Lueckes' behalf, subject to anti-dilution provisions.⁹⁶ The anti-dilution provisions provided that any pooled unit must consist of at least 60% Luecke land.⁹⁷ A lease amendment provided that if the 60% requirement was not met, additional Luecke land would have to be added to the pooled unit, and it also provided that non-Luecke land could not be added to a unit until all Luecke land had been included in the unit—and then only so much as necessary to meet the minimum-sized unit authorized by the Railroad Commission (conservation agency).⁹⁸

The lessees formed two units and drilled two horizontal wells.⁹⁹ However, each unit violated the anti-dilution provision of the Luecke leases and the lease amendment.¹⁰⁰ The surface location for the first well was located on Luecke land, but the horizontal portion of the wellbore traversed into some non-Luecke land.¹⁰¹ The surface location for the second well was not on Luecke land, but the horizontal portion of the wellbore traversed through two separate parcels of Luecke land.¹⁰² Because the units violated the anti-dilution provision—an express limitation on the lessees' pooling power—the Lueckes claimed royalty on all production from the first well, and because the wellbore for the second well traversed through two separate Luecke tracts, they claimed double royalty on all production from that well.¹⁰³

From a verdict largely favorable to the Lueckes, the lessees appealed on numerous grounds.¹⁰⁴ In addressing these various grounds, the appellate court affirmed the trial court's finding that the anti-dilution provision applied to horizontal wells and that the lessees had breached the provision.¹⁰⁵ But after much discussion, the appellate court determined that the measure of damages sought by the Lueckes was unworkable and punitive because the horizontal wellbores physically traversed and perforated both Luecke land and non-Luecke land.¹⁰⁶ The appellate court further determined that the jury was not

94. 38 S.W.3d 625 (Tex. App. 2000).

95. *Id.* at 636.

96. *Id.* at 637.

97. *Id.*

98. *Id.*

99. *Id.* at 638.

100. *Id.* at 639.

101. *Id.*

102. *Id.*

103. *Id.*

104. *Id.* at 640.

105. *Id.* at 650.

106. *Id.*

properly charged on the measure of damages.¹⁰⁷ The court then resolved the matter as follows:

In the case of a vertical well, traditional legal principles such as the rule of capture may support the Lueckes’ theory that they are entitled to royalties for all production if the wellbore is drilled on their tract. *But the rule of capture, which is premised on drainage, does not support their entitlement to royalties on all production from a horizontal well, precisely because (1) the geophysical characteristics of the formation actually inhibit the natural drainage underlying the rule of capture, (2) production from multiple drillsite tracts is involved, and (3) the fractures contributing to production are not all adjacent to any single drillsite.* The ability of a horizontal well to drain an elongated area depends upon the number of fractures encountered and the length of the drainhole.¹⁰⁸

As appellants’ expert testified, the Austin Chalk formation has low porosity and low permeability. It is also highly fractured. Due to these characteristics, few vertical wells were successful in the Austin Chalk prior to the advent of horizontal drilling. Horizontal wells enable operators to intersect multiple fractures, but the horizontal wellbores drain only the fracture gaps they penetrate. Indeed, if the Austin Chalk formation were prone to facilitate fieldwide drainage of existing oil and gas, horizontal drilling would not be as necessary. *Simply put, the migratory nature of oil and gas that supplies the rationale for the rule of capture and the Lueckes’ claim to all production from neighboring tracts does not apply to horizontal wells drilled in highly fractured formations.*¹⁰⁹

....

... *Thus, each point along the drainhole is contributing to production from isolated fractures, and no one drillsite is naturally draining minerals from all of the penetrated tracts. Even though the rule of capture and other principles of oil and gas law would afford the Lueckes royalties on all production if a vertical well were drilled on their land without valid pooling, these principles have no application in the case of horizontal wells that contain multiple drillsites on tracts owned by multiple landowners.*

Absent the ability to naturally drain neighboring tracts, the Lueckes are not entitled to production from other lessors’ tracts unless there has been a cross-conveyance of property interests. Because the purported units were invalid, there has been no cross-conveyance of interests, and the Lueckes are not entitled to royalties on production from lands they do not own. . . . Although the Lueckes’ tracts are drillsite tracts, they cannot claim royalties for total production when they have no legal claim to oil and gas recovered from other lessors’ drillsite tracts.¹¹⁰

....

The Lueckes insist that public policy supports applying traditional rule of capture principles to this dispute involving horizontal wells. But this is not simply a dispute between two private parties. Rather, the legal prin-

107. *Id.* at 644. As an aside, given the breach, had both wells been vertical wells, the Lueckes would have received a full 1/8th royalty on all production from the first well, which was drilled on Luecke land, and would have received no royalty on production from the second well, which was not located on Luecke land.

108. *Id.* at 645 (emphasis added).

109. *Id.* at 645-46 (emphasis added).

110. *Id.* at 646 (emphasis added).

ciples applicable to horizontal wells involve an industry that is highly regulated, one that is subject to the rules imposed by the Railroad Commission and statutes enacted by the legislature. Factors such as the prevention of waste, protection of the rights of landowners, and maximized recovery of minerals bear upon this area of law and necessarily affect the rights of the parties.

Moreover, in considering public policy, we must attempt to balance two competing interests. First, we recognize that Lessees should not be allowed to ignore anti-dilution provisions and exceed their pooling authority with impunity.

....

On the other hand, we recognize the immense benefits that have accompanied the advent of horizontal drilling, including the reduction of waste and the more efficient recovery of hydrocarbons. Draconian punitive damages for a lessee's failure to comply with applicable pooling provisions could result in the curtailment of horizontal drilling. We decline to apply legal principles appropriate to vertical wells that are so blatantly inappropriate to horizontal wells and would discourage the use of this promising technology. *The better remedy is to allow the offended lessors to recover royalties as specified in the lease, compelling a determination of what production can be attributed to their tracts with reasonable probability.* . . . The Lueckes are entitled to the royalties for which they contracted, no more and no less.¹¹¹

The question that relates to this article on subsurface trespass is whether the court's refusal to apply the rule of capture to horizontal drilling is correct, and if so, whether the rule would not be applied to a hydraulically fractured horizontal well in a *Garza*-like trespass situation. The subject well in *Garza* was a vertical well that was hydraulically fractured.¹¹² Therefore, if a horizontal well were drilled and then hydraulically fractured, resulting in a trespass of fluids and proppants into neighboring land, I cannot imagine the mere fact that the well is horizontal, as opposed to vertical, would cause the Texas Supreme Court to distinguish *Garza* and find an actionable trespass. Rather, I would expect that the rule of capture would and should be applied to a horizontal well—at least for purposes of subsurface trespass by hydraulic fracturing.¹¹³ Drilling and hydraulically fracturing a horizontal well is not so different from waterflooding in that both result in the production of hydrocarbons that would not be recovered absent the subsurface invasion of the horizontal wellbore or the injected water. Thus, I would expect

111. *Id.* at 646-47 (emphasis added).

112. *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1, 7 (Tex. 2008).

113. Moreover, I think the Texas Court of Appeals's holding in *Browning* regarding the measure of damages emasculated the anti-dilution clause of the Lueckes' leases. Recognizing the fact that the well was not wholly confined to Luecke tracts, I would argue that the appropriate measure of damages should have been the difference between the royalty that the Lueckes received under the unit as formed and the royalty the Lueckes would have received if the unit had been properly formed in compliance with the anti-dilution clause. *Cf. Sw. Gas Producing Co. v. Seale*, 191 So.2d 115 (Miss. 1966). The fact that the Lueckes claimed double royalty on the well that traversed two separate tracts but lost on appeal reminds one of the moral: "Pigs get fed but hogs get slaughtered."

the Texas Supreme Court to hold that the rule of capture applies to a hydraulically fractured horizontal well—just as it did in *Garza*, when the court cited and relied upon its prior decision in *Railroad Commission of Texas v. Manziel*,¹¹⁴ which dealt with waterflooding.¹¹⁵

D. Subsurface Trespass Resulting from Subsurface Use to Access Minerals Beneath Other Land

What about a more invasive directional trespass against the mineral owner? Suppose that an operator who holds the right to develop Tract B locates a well on the surface of Tract A and uses the surface and subsurface of Tract A to gain access to the Tract B hydrocarbons? Further suppose that the Tract A surface owner gave the operator permission to use both the surface and subsurface of Tract A for this purpose but that the mineral (hydrocarbon) owner of Tract A did not give permission. Further, suppose that the surface of Tract B will not readily accommodate an efficient well location and that all well perforations comply with conservation regulations and are limited to Tract B. In these circumstances, I would argue that the operator’s use of Tract A, when made with the surface owner’s permission, should not constitute a trespass against the mineral owner *unless* the mineral owner suffers actual and substantial harm beyond drainage—such as when the location of the well or wellbore leaves no suitable well or wellbore location for the mineral owner to exploit the minerals beneath Tract A.

Drainage should be protected under the rule of capture, and use of the surface and subsurface of Tract A should not be grounds for an “obstruction” claim by the mineral owner against the surface owner. To recognize such an action could cause underground waste. Moreover, if the mineral owner has to consent to such a use, then this would likely mean that all co-tenant mineral owners would have to consent.¹¹⁶ Due to the proliferation of fractional mineral ownership, obtaining unanimous consent would be often difficult and costly, if not impossible in many situations, especially because mineral owners have a natural incentive to deny access due to the drainage they might suffer.¹¹⁷ I would even go so far as to allow the operator of Tract B to use the subsurface of a tract between Tract A and B without any permission and be free from trespass liability unless the mineral owner of that intervening tract suffers actual and substantial harm beyond mere drainage from the well-

114. 361 S.W.2d 560 (Tex. 1962).

115. *Garza*, 268 S.W.3d at 12.

116. See *Elliott v. Elliott*, 597 S.W.2d 795, 802 (Tex. Civ. App. 1980).

117. In *Ellis v. Ark. La. Gas Co.*, 450 F. Supp. 412, 422 (E.D. Okla. 1978), the court observed that if “it was the mineral interest owner and not the surface owner who had the power to grant storage rights, it would typically mean that hundreds of severed mineral interest owners would have to be contacted if those rights were to be obtained privately.”

bore perforation under Tract B.

This issue of access to minerals via horizontal drilling is particularly important in urban areas, such as in and near Fort Worth, Texas, where the Barnett Shale gas development is occurring in areas where intense surface use is making it difficult for operators to find suitable well locations. Intense surface use necessitates locating wells off of the unit boundaries, and an off-unit location has the added advantage of allowing the horizontal wellbore to more fully penetrate the entire reservoir beneath the unit area.

I believe the surface owner, not the mineral owner, holds the legal right to grant or deny such permission. Why? Because, absent broader surface-use provisions in the original severance instrument or effective pooling or unitization, surface use by the mineral owner in connection with the exploration or exploitation of minerals on other lands is beyond the scope of the mineral owner's right of reasonable surface use at common law.¹¹⁸

But should the mineral owner have a concurrent right to grant permission? I argue "no" on grounds of public policy—the prevention of underground waste. I would even go so far as to suggest that when the mineral owner or lessee has the express right in the severance instrument to use the surface to access adjacent minerals, a court should not construe that right as being exclusive—even if the word "exclusive" is used in the granting clause of the instrument to describe the mineral owner's right of surface use.¹¹⁹ This type of language in an instrument should be construed as giving the mineral owner or lessee the exclusive right to use the surface to gain access to its own minerals, whether beneath the subject or nearby lands. The language should not, however, give the mineral owner or lessee the right to bar access to third parties wanting to use the surface to reach their minerals. That right should continue to rest with the surface owner, who should be under no obligation to the mineral owner to prohibit such use unless it would effectively bar the mineral owner from using the property to exploit its minerals. I would so hold even if the surface owner also owns mineral rights that are under lease. In other words, in this situation, I would not allow the lessee to bring a suit in obstruction. Well spacing and density regulations should provide sufficient protection to the invaded mineral owner in most circumstances.

118. See, e.g., *Russell v. Tex. Co.*, 238 F.2d 636, 642 (9th Cir. 1956) ("It is a well established principle of property law that the right to use the surface of land as an incident of the ownership of mineral rights in the land, does not carry with it the right to use the surface in aid of mining or drilling operations on other lands."). See generally *Anderson*, *supra* note 59.

119. See *Grubstake Inv. Ass'n v. Coyle*, 269 S.W. 854 (Tex. Civ. App. 1925) (challenging that the lessee had "exclusive right to lay pipe lines, build tanks, and other structures" on the leased premises but the court allowed the neighboring operator to use the surface of the land to aid in drilling a well into an adjacent riverbed).

Does case law support my argument? Yes, but it is mixed.¹²⁰ In *Atlantic Refining Co. v. Bright & Schiff*,¹²¹ oil and gas lessors (also apparent surface owners) entered into a surface lease that allowed an oil and gas operator on neighboring property to temporarily locate pits, pumps, and tanks incident to drilling on the surface so the operator could drill a well on its own property.¹²² The oil and gas lessee challenged the right of the lessors to issue a surface lease that facilitated drilling on other land.¹²³ The court rejected this challenge, noting that the lessee “must prove that the use interferes with the reasonable exercise of his own rights under his own lease. To do this he must prove that he needs the surface at the time and place then being used by the other user.”¹²⁴ The court also rejected the lessee’s concern that the well in question would end up draining the lessee’s tract.¹²⁵ The court concluded that: “Drainage presents no new problem. The rule of capture is settled law.”¹²⁶

In *Grubstake Investment Ass’n. v. Coyle*,¹²⁷ an oil and gas lessee of land adjacent to a river challenged the right of the operator-lessee of the riverbed to erect on the land, with the surface owner’s permission, “a small toolhouse, a boiler, small tanks, and a tent” to aid drilling a well beneath the riverbed.¹²⁸ Noting that the well itself was not located on the land at issue, the appellate court affirmed the jury’s decision that the surface use did not interfere with the lessee’s rights to develop its lease.¹²⁹ Thus, the use could not be barred by the complaining lessee.¹³⁰

Dictum in *Union Oil of California v. Domengeaux*,¹³¹ suggests that, in some cases, a trespassing slant well might not be enjoined:

[W]e do not wish to be understood as holding that every subsurface trespass in the drilling of an oil well would warrant injunctive relief. We can conceive of an oil well deviating slightly from the perpendicular, trespassing to a small extent upon the land of an adjoining owner and returning to oil-producing strata within the property of the owner of the well. In such case, the damage, if any, to the adjoining owner might be said to be wholly inconsequential and equitable relief might properly be withheld . . .¹³²

Thus, while this dictum suggests a minor and perhaps unintentional

120. Even express contract provisions are sometimes unenforceable on the ground of public policy. In the subsurface trespass context, see *Lachman v. Sperry-Sun Well Surveying*, 457 F.2d 850, 853 (10th Cir. 1972) (refusing to enforce confidentiality agreement to conceal a directional wellbore that trespassed beneath neighboring land).

121. 321 S.W.2d 167 (Tex. Civ. App. 1959).

122. *Id.* at 168.

123. *Id.*

124. *Id.* at 169.

125. *Id.*

126. *Id.*

127. 269 S.W. 854 (Tex. Civ. App. 1925).

128. *Id.*

129. *Id.* at 856.

130. *Id.*

131. 86 P.2d 127 (Cal. Ct. App. 1939).

132. *Id.* at 130.

trespass, it also suggests that the subsurface owner would have to suffer actual and substantial damages before relief, including equitable relief, will be granted, even though the wellbore would constitute a continuing trespass.

In *Humble Oil & Refining Co. v. L. & G. Oil Co.*,¹³³ the plaintiff oil and gas lessee was not allowed to prevent another operator from using the surface of a one-acre leasehold as a well site to drill a slant well to access hydrocarbons from beneath a railroad right of way.¹³⁴ The operators had acquired fee title to the one-acre tract, subject to the plaintiff's oil and gas lease.¹³⁵ The court summarily affirmed the trial court's finding of fact that the well did not interfere with the plaintiff's leasehold rights.¹³⁶

However, in *Mid-Texas Petroleum Co. v. Colcord*,¹³⁷ the court allowed the oil and gas lessees to enjoin the drilling of slant wells by another operator on two of their leased tracts.¹³⁸ The operator sought to access hydrocarbons beneath an adjacent riverbed; however, the court found that, under the particular circumstances, the whole surface was needed by the lessees.¹³⁹ At first blush, the finding that the whole surface was needed by the lessees seems questionable in light of the fact that the area at issue comprised two, twenty-acre tracts.¹⁴⁰ But, the extent of surface use by the slant-well operators was also not fully explained. On closer study, the tracts in question were long, narrow, and adjacent to the riverbed, and they apparently were underlain with three productive sands.¹⁴¹ Thus, the shape of the tracts and the date of the case, 1921, suggest that both the slant-well operators and the lessees might each have intended to use much of the surface of both tracts in order to drill multiple single-completion wells and associated facilities. Moreover, the court reasoned that the plaintiff lessees would need the surface because they would be obliged to fully offset each of the slant wells, which would drain oil from beneath their lease.¹⁴² The court also did not seem troubled by the idea that the slant wells would drain the leasehold, but it did recognize that the lessees would need the entire surface to drill appropriate offsetting wells.¹⁴³ Today, given modern well-spacing laws and multiple-completion technologies, a court would not likely make the same fact findings regarding the lessee's need to use the

133. 259 S.W.2d 933 (Tex. Civ. App. 1953).

134. *Id.* at 934.

135. *Id.*

136. *Id.* at 938.

137. 235 S.W. 710 (Tex. Civ. App. 1921).

138. *Id.* at 711.

139. *Id.*

140. *Id.*

141. *Id.* at 711, 714.

142. *Id.* at 714.

143. *Id.*

entire surface of two, twenty-acre tracts.

Unfortunately, a more recent case, *Chevron Oil Co. v. Howell*,¹⁴⁴ suggests a similar result. Here the court appears to have assumed, without expressly deciding, that both a surface tenant and an oil and gas lessee could enjoin the slant-well operations of another party who was seeking to access hydrocarbons beneath an adjacent riverbed.¹⁴⁵ The slant-well operator claimed to have a license from the United States, as surface owner, to locate the slant well on the premises.¹⁴⁶ However, the court found that the operator’s documentation did not grant such a license and, therefore, allowed both the surface tenant and the mineral lessee to enjoin the operation.¹⁴⁷ In so doing, the court found that “[t]he testimony of appellant’s own witness, its superintendent, was to the effect that to drill the hole is to damage the formation—‘any time you drill into something there is bound to be some damage.’”¹⁴⁸ The court then concluded that “continuous trespasses to mining property are irreparable and the legal remedy is inadequate, hence equity is quick to restrain the trespass. . . . [E]quity will intervene to avoid the necessity of the filing of a multiplicity of damage suits by the aggrieved party in cases involving continuing trespasses.”¹⁴⁹ While I have no problem with enjoining the operation under these facts—as the operator actually had no permission to use the surface—I am troubled by the court’s reasoning, which allows the mineral owner to enjoin any such use on the ground that “any time you drill into something there is bound to be some damage.”¹⁵⁰

Two California cases support the right of a mineral owner to enjoin use of the surface by another hydrocarbon operator on grounds of trespass.¹⁵¹ One case cites the drainage of a common pool as the primary basis for injunctive relief.¹⁵² The other case relies on the language of the instrument giving “exclusive” rights to the hydrocarbon claimant.¹⁵³

144. 407 S.W.2d 525 (Tex. Civ. App. 1966).

145. *See id.*

146. *Id.* at 527.

147. *Id.* at 528.

148. *Id.*

149. *Id.* (citation omitted).

150. *Id.*

151. *See New v. New*, 306 P.2d 987 (Cal. Ct. App. 1957); *Hancock Oil Co. v. Meeker-Garner Oil Co.*, 257 P.2d 988 (Cal. Ct. App. 1953) (allowing mineral owner to enjoin use of surface by mineral operator to develop adjoining land even though the operator had secured permission from the surface owner).

152. *Hancock*, 257 P.2d at 991-92.

153. *New*, 306 P.2d at 996 (stating mineral claimants held an instrument giving them the “the exclusive right to enter upon said lands * * * for [drilling] purposes”). The *New* court concluded:

Though the matter is not free from doubt, we think this instrument conferred upon the contractor exclusive use of the surface so far as producing oil from the premises was concerned.

The parties were not thinking about slant drilling when this document was drafted; it gave contractor the exclusive oil exploration and production rights . . .

Id. Other cases have addressed the question of whether a lease confers “exclusive” rights to *explore* for minerals and have often turned on the express language of the lease. *Cf. Shell Petrol. Corp. v.*

However, in contrast to *Garza*, neither case addressed whether damages caused by drainage should be protected under the rule of capture.¹⁵⁴ Moreover, neither case considered whether its ruling could lead to economic or underground waste.

In *Phillips Petroleum Co. v. Cowden*,¹⁵⁵ the court recognized that the surface owner and the mineral owner may concurrently hold the rights to use the surface of their property to conduct seismic surveying for the purpose of exploring nearby property.¹⁵⁶ The court reached this conclusion on the ground that any gathered information about nearby property is bound to be even more informative about the occupied property.¹⁵⁷ If the targeted area of the survey includes the land at issue, then I think a mineral owner should have to grant permission.¹⁵⁸ However, the occupied land may not be the targeted area in the case of a 3-D seismic survey. In a 3-D survey, data is gathered from above and around the targeted area. As I have previously written, the rule of capture should protect the gathering of seismic information from nearby lands so long as there is no surface trespass.¹⁵⁹ Applying the rule of capture will prevent the economic waste of having gathered information but not being able to use the information that directly relates to invaded land.

E. Subsurface Trespass Resulting from Waste Disposal Operations

A regulatory body, such as an oil and gas conservation agency, has no general authority to authorize trespasses or other torts.¹⁶⁰ Nevertheless, a trespasser in possession of a regulatory permit may have some insulation from trespass claims. The most obvious example is to assist in responding to an emergency by extinguishing a well blowout and fire.¹⁶¹ Temporary invasions are also privileged if necessary to establish justice, such as performing a directional survey of a wellbore that may be encroaching on neighboring land.¹⁶² But, what if the holder of a regulatory permit commits a subsurface trespass in direct facilitation of its own commercial interests?

Puckett, 29 S.W.2d 809 (Tex. Civ. App. 1930) (finding exploration rights were non-exclusive under the lease); *Wilson v. Tex. Co.*, 237 S.W.2d 649, 650 (Tex. Civ. App. 1951) (finding exploration rights were "exclusive" by express language in the lease).

154. See discussion *supra* Part IV.B.

155. 241 F.2d 586 (5th Cir. 1957).

156. *Id.* at 590.

157. *Id.*

158. I say "a" mineral owner because in *Enron Oil & Gas Co. v. Worth*, 947 P.2d 610 (Okla. Civ. App. 1997), the court held that seismic operations could be conducted by the owner of a fractional mineral interest even though all mineral interest owners may be affected by the seismic operations.

159. See generally Anderson & Pigott, *supra* note 80, at 16-111 to 16-117.

160. See, e.g., *Berkley v. R.R. Comm'n*, 282 S.W.3d 240, 243 (Tex. App. 2009).

161. See, e.g., *Corzelius v. R.R. Comm'n*, 182 S.W.2d 412, 413-14 (Tex. Civ. App. 1944).

162. See, e.g., *Williams v. Cont'l Oil Co.*, 14 F.R.D. 58, 64 (W.D. Okla. 1953); *Gliptis v. Fifteen Oil Co.*, 16 So. 2d 471, 481-82 (La. 1944).

The simplest form of such a direct sub-trespass occurs in the context of waste disposal, including wastewater disposal, because the focus of the court is on the invading waste. Wastewater disposal cases indicate that courts are reluctant to allow a trespass claim absent actual damages—at least when, as is typically the case, the disposing party has a regulatory permit.

In *FPL Farming, Ltd. v. Texas Natural Resource Conservation Commission*,¹⁶³ the state regulatory agency issued permits for disposal of non-hazardous waste at depths between 7,350 to 8,200 feet below the surface.¹⁶⁴ Before issuing the permit, the agency required the applicant to project how far and in what directions the waste might migrate over a thirty-year period.¹⁶⁵ When neighboring surface owners discovered that the injected waste was projected to reach their subsurface strata within ten years, they asserted that the agency was authorizing an impairment of their subsurface rights.¹⁶⁶ The court acknowledged a legal trend that “property owners do not have the right to exclude deep subsurface migration of fluids”¹⁶⁷ and rejected the argument that “migration alone will impair [their] existing rights.”¹⁶⁸ The court concluded that “some measure of harm must accompany the migration.”¹⁶⁹ “[B]ecause of [the agency’s] expertise in the geological effects of subsurface migration of injectates,” the court deferred to the agency’s finding that, in this case, no existing rights would be impaired by the injection operations.¹⁷⁰ Nevertheless, the court indicated that, if the waste did migrate and cause some measure of harm, the surface owners could seek damages from the injector.¹⁷¹ FPL thereafter filed a separate suit seeking injunctive relief and alleging various claims, including trespass, unjust enrichment, and negligence.¹⁷² But, as migration and actual harm are generally difficult to prove,¹⁷³ the court prudently rejected each of FPL’s causes of action and, to FPL’s trespass claim, specifically found that “no actionable common law trespass ha[d] occurred.”¹⁷⁴ In reaching its conclusion, the

163. No. 03-02-00477-CV, 2003 WL 247183 (Tex. App. Feb. 6, 2003).

164. *Id.* at *1.

165. *Id.*

166. *Id.* at *2.

167. *Id.* at *3 (citing *United States v. Causby*, 328 U.S. 256, 260-61 (1946); *Raymond v. Union Tex. Petrol. Corp.*, 697 F. Supp. 270, 274-75 (E.D. La. 1988); *Chance v. BP Chems., Inc.*, 670 N.E.2d 985, 991-92 (Ohio 1996); *R.R. Comm’n v. Manziel*, 361 S.W.2d 560, 568-69 (Tex. 1962)).

168. *Id.* at *4.

169. *Id.*

170. *Id.*

171. *Id.* at *5.

172. *FPL Farming Ltd. v. Envtl. Processing Sys., L.C.*, No. 09-08-00083-CV, 2009 WL 3460710, at * 1-2 (Tex. App. Oct. 29, 2009).

173. *See, e.g., Mongrue v. Monsanto Co.*, 249 F.3d 422 (5th Cir. 2001); *Chance*, 670 N.E.2d 985. *But see Starrh & Starrh Cotton Growers v. Aera Energy L.L.C.*, 63 Cal. Rptr. 3d 165 (Ct. App. 2007) (describing how wastewater from an oil well percolated from a surface pit and migrated to neighboring land, causing degradation of water, which if returned to its natural state had some potential value for irrigating certain salt-tolerant crops).

174. *FPL Farming Ltd.*, 2009 WL 3460710, at *4

court stated that “when a state agency has authorized deep subsurface injections, no trespass occurs when fluids that were injected at deep levels are then alleged to have later migrated at those deep levels into the deep subsurface of nearby tracts.”¹⁷⁵

Likewise, in *Raymond v. Union Texas Petroleum Corp.*,¹⁷⁶ the plaintiffs claimed that saltwater injected under adjacent lands migrated to their subsurface property.¹⁷⁷ Noting that the state regulatory agency had issued a permit for the saltwater injection, the federal district court in Louisiana concluded that such migration “is not unlawful and does not constitute a legally actionable trespass.”¹⁷⁸ In dictum, however, the court acknowledged that a permit does not preclude recovery for actual damages.¹⁷⁹ Later, in *Mongrue v. Monsanto Co.*,¹⁸⁰ the United States Court of Appeals for the Fifth Circuit affirmed a finding that migrating wastewater that crosses property lines is not a taking without just compensation.¹⁸¹ Although not raised on appeal, the plaintiffs also asserted at trial that the injector had committed subsurface trespass.¹⁸² Regarding this unraised issue, the Fifth Circuit seemed to accept the district court’s conclusion that “upon a proper showing of damages [for migration], appellants may recover under a state unlawful trespass claim . . . regardless of the permit allowing for injection.”¹⁸³ Still later, the Fifth Circuit affirmed the reasoning of *Raymond*, that migration of injected wastewater is not per se “unlawful” if a valid regulatory permit authorizes the action.¹⁸⁴

One of the most important waste-disposal cases is *Chance v. BP Chemicals, Inc.*,¹⁸⁵ a class-action suit against BP Chemicals, alleging *inter alia* subsurface trespass resulting from injecting waste fluids that migrated across property lines.¹⁸⁶ Relying on *Willoughby Hills v. Corrigan*,¹⁸⁷ the court observed that:

[O]wnership rights in today’s world are not as clear-cut as they were before the advent of airplanes and injection wells.

Consequently, we do not accept appellants’ assertion of absolute ownership of everything below the surface of their properties. Just as a property owner must accept some limitations on the ownership rights extending above the surface of the property, we find that there are also

175. *Id.*

176. 697 F. Supp. 270 (E.D. La. 1988).

177. *Id.* at 271.

178. *Id.* at 274.

179. *Id.*

180. 249 F.3d 422 (5th Cir. 2001).

181. *Id.* at 425.

182. *Mongrue v. Monsanto Co.*, No. CIV.A. 98-2531, 1999 WL 970354 (E.D. La. Oct. 21, 1999), *aff’d*, 249 F.3d 422 (5th Cir. 2001).

183. *Mongrue*, 249 F.3d at 432 n.17.

184. *Boudreaux v. Jefferson Island Storage & Hub, L.L.C.*, 255 F.3d 271, 274 (5th Cir. 2001).

185. 670 N.E.2d 985 (Ohio 1996).

186. *Id.* at 986.

187. 278 N.E.2d 658 (Ohio 1972).

limitations on property owners’ subsurface rights. We therefore extend the reasoning of *Willoughby Hills*, that absolute ownership of air rights is a doctrine which “has no place in the modern world,” to apply as well to ownership of subsurface rights.¹⁸⁸

The court concluded that the right to exclude others from the subsurface extends only to invasions that “actually interfere with the appellants’ reasonable and foreseeable use of the subsurface.”¹⁸⁹ Thus, the landowner must suffer actual damages that affect their reasonable and foreseeable *use* of the subsurface, not mere interference with title or possession. The court expressly found that the trial court did not err in refusing to allow the class to present evidence that “environmental stigma associated with the deepwells had a negative effect on appellants’ property values due to the public perception that there may have been injectate under appellants’ property and that the injectate may be dangerous.”¹⁹⁰ In other words, a landowner may not recover damages for mere loss of speculative value. Although the class claims were deemed too speculative, the court did acknowledge that one class member might have a valid claim because the subsurface migration of waste forced that class member to abandon plans to drill for natural gas.¹⁹¹ Thus, a mineral owner may have a valid trespass claim when the injected waste migrates across property lines and unreasonably interferes with access to recoverable minerals, such as oil and gas.

Oklahoma recognizes a cause of action for private nuisance when injected water injures another’s interest in a well or leasehold, even though the water was injected for enhanced oil recovery pursuant to a regulatory permit.¹⁹² However, the requirement of showing actual injury or recoverable damages remains.¹⁹³ Regarding the disposal of saltwater produced from petroleum wells, the court recognized that “[i]f such disposal of salt water is forbidden unless oil producers first obtain the consent of all persons under whose lands it may migrate or percolate, [then] underground disposal would be practically prohibited.”¹⁹⁴

In *Snyder Ranches, Inc. v. Oil Conservation Commission*,¹⁹⁵ the New Mexico Supreme Court affirmed a decision of the conservation agency that found a saltwater disposal operation would not result in

188. *Chance*, 670 N.E.2d at 992.

189. *Id.*

190. *Id.* at 993.

191. *Id.* at 994 n.1.

192. *Greyhound Leasing & Fin. Corp. v. Joiner City Unit*, 444 F.2d 439, 444-45 (10th Cir. 1971); *Boyce v. Dundee Healdton Sand Unit*, 560 P.2d 234 (Okla. Civ. App. 1975).

193. *See West Edmond Salt Water Disposal Ass’n v. Rosecrans*, 226 P.2d 965, 970 (Okla. 1950) (finding owner of adjacent tract had no cause of action for trespass when defendant injected saltwater into stratum already containing saltwater because no actual damages were suffered). *But see West Edmond Lime Unit v. Lillard*, 265 P.2d 730, 732 (Okla. 1954) (allowing cause of action when injected saltwater had migrated beneath neighboring land, harming ongoing petroleum operations).

194. *West Edmond*, 226 P.2d at 969.

195. 798 P.2d 587 (N.M. 1990).

saltwater migration to a nearby tract.¹⁹⁶ However, the court stated in dicta:

The State of New Mexico may be said to have licensed the injection of saltwater into the disposal well; however, such license does not authorize trespass . . . or other tortious conduct by the licensee, nor does such license immunize the licensee from liability for negligence or nuisance which flows from the licensed activity. . . . In the event that an actual trespass occurs by Mobil in its injection operation, neither the Commission's decision, the district court's decision, nor this opinion would in any way prevent Snyder Ranches from seeking redress for such trespass.¹⁹⁷

This dictum is disturbing in that it does not suggest that the plaintiff need suffer any actual damages to obtain relief for such a trespass.

A few jurisdictions take an even more limited view of subsurface trespass than the court in *Chance*, requiring that a subsurface trespasser know with "substantial certainty" that pollutants would migrate to neighboring land. In *OBG Technical Services, Inc. v. Northrop Grumman Space & Mission Systems Corp.*,¹⁹⁸ the plaintiff suffered actual soil and groundwater contamination from the actions of a subsurface trespasser ironically named Best Friends.¹⁹⁹ The court denied relief on the ground that the plaintiff failed to prove Best Friends knew with "substantial certainty" that pollutants on Best Friends's property were migrating onto the plaintiff's property.²⁰⁰ The court noted:

In Connecticut, "the requisite intent to enter another's land may be established if the act in question is done 'with knowledge that it will to a substantial certainty result in the entry of the foreign matter.'" "In order to be liable for trespass, one must *intentionally* cause some substance or thing to enter upon another's land." "Moreover, the intention required to make the actor liable for trespass is an intention to enter upon the particular piece of land in question. . . . An intrusion on the land of another as a result of negligence is not a trespass."²⁰¹

F. Subsurface Trespass Resulting from Enhanced-Recovery Operations

Trespass issues arise when an operator injects a substance into the subsurface of its own property for secondary or enhanced oil or gas recovery and that injected substance then invades the subsurface of neighboring property. These cases are not as simple as waste-disposal cases because the focus of the plaintiff and the court is on the plaintiff's loss of hydrocarbons resulting from the secondary or enhanced-recovery operations. Damages can arise when oil reserves on the invaded prop-

196. *Id.* at 588.

197. *Id.* at 590.

198. 503 F. Supp. 2d 490 (D. Conn. 2007).

199. *Id.* at 496-97.

200. *Id.* at 530; *cf.* Vill. of DePue v. Viacom Int'l, Inc., Nos. 08-cv-1272, 08-cv-1273, 2009 WL 1841582, at *9 (C.D. Ill. June 25, 2009) (holding that plaintiff must prove either negligent or intentional conduct resulting in an invasion).

201. *OBG Technical Servs.*, 503 F. Supp. 2d at 530 (citations omitted).

erty are displaced or when the invasion makes recovery of reserves from the invaded property more difficult and expensive. Cases addressing alleged subsurface trespass in the context of secondary and enhanced-recovery operations are mixed, but several cases suggest that trespass claims are less likely to succeed if a regulatory agency has authorized the particular operations.

In *Manziel*, neighboring landowners sought to set aside a conservation-agency order approving a plan of voluntary unitization for secondary oil recovery.²⁰² The landowners were particularly concerned about an exception-location well that was to be drilled near their tract.²⁰³ As grounds for setting aside the order, the landowners claimed that injected water would inevitably invade their property and result in a trespass that would water out one of their oil wells.²⁰⁴

Although the landowners sought to set aside a regulatory order, the court stated the issue as follows: “whether a trespass is committed when secondary recovery waters from an authorized secondary recovery project cross lease lines.”²⁰⁵ After discussing the value of secondary recovery operations, the court concluded:

[I]f, in the valid exercise of its authority to prevent waste, protect correlative rights, or in the exercise of other powers within its jurisdiction, the Commission authorizes secondary recovery projects, a trespass does not occur when the injected, secondary recovery forces move across lease lines, and the operations are not subject to an injunction on that basis. *The technical rules of trespass have no place in the consideration of the validity of the orders of the Commission.*²⁰⁶

In support of its conclusion, the court quoted Professors Howard Williams and Charles Meyers:

What may be called a ‘negative rule of capture’ appears to be developing. Just as under the rule of capture a landowner may capture such oil or gas as will migrate from adjoining premises to a well bottomed on his own land, so also may he inject into a formation substances which may migrate through the structure to the land of others, even if it thus results in the displacement under such land of more valuable with less valuable substances . . .²⁰⁷

Although the court stated the issue as whether a trespass had occurred, the court also recognized that it was “not confronted with the tort aspects of such practices. Neither is the question raised as to whether the Commission’s authorization of such operations throws a protective cloak around the injecting operator who might otherwise be subjected to the risks of liability for actual damages to the adjoining

202. *Id.* at 561.

203. *Id.*

204. *Id.* at 561-62.

205. *Id.* at 567.

206. *Id.* at 568-69 (emphasis added).

207. *Id.* at 568 (quoting HOWARD WILLIAMS & CHARLES MEYERS, OIL AND GAS LAW § 204.5 (1995)).

property”²⁰⁸

The court, however, discussed trespass in some detail and was sympathetic to the view that traditional trespass rules may not be appropriate regarding subsurface invasions that relate to secondary recovery—an apparent important societal need.²⁰⁹ But, the court’s discussion suggests that a regulatory order, issued in the public interest, is necessary if traditional trespass rules are to be avoided.²¹⁰ The *need* for a regulatory permit is now questionable in light of *Garza*, in which the defendant had a drilling permit but not a permit to hydraulically fracture because the conservation agency did not require one.²¹¹ Nevertheless, in circumstances regarding invasive subsurface injections of a continuing nature—in contrast with hydraulic fracturing which is a short-term well-completion technique, a regulatory permit would be helpful, perhaps even necessary—to the avoidance of an actionable subsurface trespass. As a practical matter, the need for a permit to avoid a subsurface trespass action for continuing injections is not particularly troublesome as regulation of such an activity seems almost certain.

In *Crawford v. Hrabe*,²¹² the Kansas Supreme Court found no actionable trespass when a permittee injected water for secondary recovery.²¹³ Here, the lessee brought wastewater onto the leased premises and injected it into the lessor’s subsurface.²¹⁴ The plaintiffs claimed their interests would be injured by the migration of this water throughout their subsurface.²¹⁵ The court surveyed other jurisdictions’ treatment of subsurface trespass of wastewater, finding that the orthodox rules applied to surface trespasses do not usually apply to subsurface trespass and that, when water is injected to increase production on the lessor’s land, no actionable trespass occurs.²¹⁶ The court found that injecting wastewater for secondary-recovery operations was a practical and efficient use of a potentially hazardous waste product.²¹⁷

In *Tide Water Associated Oil Co. v. Stott*,²¹⁸ lessors were denied damages for the displacement of wet gas with dry gas resulting from gas recycling operations in the field where the lessors refused the opportunity to include their leases in the operations.²¹⁹ In *Syverson v. North*

208. *Id.* at 566.

209. *Id.* at 568.

210. *Id.*

211. *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1, 15 (Tex. 2008).

212. 44 P.3d 442 (Kan. 2002).

213. *Id.* at 453.

214. *Id.* at 444.

215. *Id.* at 444, 447.

216. *Id.* at 448-50 (citing *Holt v. Sw. Antioch Sand Unit, Fifth Enlarged*, 292 P.2d 998 (Okla. 1955); *R.R. Comm’n v. Manziel*, 361 S.W.2d 560, 568 (Tex. 1962); *Geo Viking, Inc. v. Tex-Lee Operating Co.*, 817 S.W.2d 357 (Tex. Civ. App. 1991)).

217. *Id.* at 453.

218. 159 F.2d 174 (5th Cir. 1947).

219. *Id.* at 179; *see also* *Cal. Co. v. Britt*, 154 So. 2d 144 (Miss. 1963) (barring damages to

Dakota Industrial Commission,²²⁰ the court upheld a conservation-agency order authorizing secondary-recovery operations over the objection of a small number of lessors within the field in which the record indicated that they were given a fair opportunity to join in operations but refused to do so.²²¹ The court noted that the unit operations were designed to increase ultimate recovery from the reservoir and that the lessors had not shown that they would suffer any actual harm as a result of such operations.²²²

On the other hand, in *Cassinis v. Union Oil Company of California*,²²³ a California appellate court found that wastewater injected into a petroleum reservoir did cause actual damage to production operations on neighboring land.²²⁴ The court found this to be an actionable trespass against the neighboring mineral estate.²²⁵ In reaching this decision, the court cited three Oklahoma cases, one of which was found to be analogous because saltwater-injection operations had caused actual damages to nearby wells.²²⁶ The court distinguished the other two cases because, in those cases, the courts found the injection operations caused no actual damages.²²⁷

In *Tidewater Oil Co. v. Jackson*,²²⁸ the court held that the injection of wastewater for secondary recovery constitutes an actionable trespass when the injected water flooded the neighboring plaintiff’s oil wells even though the operator held a regulatory permit authorizing the operations.²²⁹ The court reasoned:

[T]hough a water flood project in Kansas be carried on under color of public law, as a legalized nuisance or trespass, the water flooder may not conduct operations in a manner to cause substantial injury to the property of a non-assenting lessee-producer in the common reservoir, without incurring the risk of liability therefor.²³⁰

To establish liability, “[i]t is sufficient that the water flooding activities were intentional and the consequences foreseeable. They were actionable, even though lawfully carried on, if they caused substantial injury to the claimants.”²³¹ Nevertheless, because the activity was lawful

unleased mineral owners who refused to join in a voluntary unitization operation on grounds that any drainage suffered was governed by the rule of capture).

220. 111 N.W.2d 128 (N.D. 1961).

221. *Id.* at 133-34.

222. *Id.* at 132.

223. 18 Cal. Rptr. 2d 574 (Ct. App. 1993).

224. *Id.* at 579-80.

225. *Id.* at 577.

226. *Id.* at 580. The analogous case is *West Edmond Lime Unit v. Lillard*, 265 P.2d 730, 731-32 (Okla. 1954).

227. *Cassinis*, 18 Cal. Rptr. 2d at 580 (distinguishing *West Edmond Salt Water Disposal Ass’n v. Rosecrans*, 226 P.2d 965, 968-69 (Okla. 1950) (finding no actual harm); *Sunray Oil Co. v. Cortez Oil Co.*, 112 P.2d 792, 793-95 (Okla. 1941) (finding no probability of any actual harm)).

228. 320 F.2d 157 (10th Cir. 1963).

229. *Id.* at 163-64.

230. *Id.* at 163.

231. *Id.* at 164.

under a conservation agency order, the court reversed an award of punitive damages.²³² Similarly, in *Hartman v. Texaco Inc.*,²³³ the New Mexico Court of Appeals held that an oil and gas operator who suffered actual damages from a waterflooding operation conducted on neighboring lands had a cause of action for trespass.²³⁴ However, the court rejected the plaintiff's claim for statutory recovery of double (punitive) damages, concluding that the statute did not apply in the case of a subsurface trespass.²³⁵

Three cases arising in Arkansas have reached somewhat divergent views on waterflooding operations. In *Budd v. Ethyl Corp.*,²³⁶ the plaintiff sought damages for loss of brine resulting from waterflooding operations on two separate tracts of land.²³⁷ The first tract was on the edge of the waterflooding operation.²³⁸ The plaintiff held an oil and gas lease for a fractional interest in the second tract, which was within the circle of the defendant's injection wells.²³⁹ Regarding the edge tract, the court found that the defendant was protected by the rule of capture.²⁴⁰ Regarding the second tract, the court found that, as an oil and gas lessee, the plaintiff held only an inchoate right to drill for minerals and no right to minerals in place.²⁴¹ Moreover, the court noted that the record failed to indicate whether the plaintiff had volunteered to participate in the waterflooding effort.²⁴² Accordingly, the court declined to award the plaintiff damages for net profits.²⁴³ Thus, the claim was not really grounded in trespass but was rather a claim by a co-tenant for net profits.

In a later federal decision, *Young v. Ethyl Corp.*,²⁴⁴ the court found that a claim of trespass will lie when a mineral owner seeks damages in a circumstance in which the subject tract is within the circle of injection wells.²⁴⁵ This analysis was adopted by the Arkansas Supreme Court in *Jameson v. Ethyl Corp.*,²⁴⁶ when the plaintiff was a fee mineral owner, but the court nevertheless allowed the waterflooding operations to continue on public-policy grounds.²⁴⁷ The court stated:

[W]e are unwilling to extend the rule of capture further. By adopting an

232. *Id.* at 165.

233. 937 P.2d 979 (N.M. Ct. App. 1997).

234. *Id.* at 980.

235. *Id.* (construing N.M. STAT. § 30-14-1.1 (1978)).

236. 474 S.W.2d 411 (Ark. 1971).

237. *Id.* at 412-13.

238. *Id.* at 412.

239. *Id.* at 413.

240. *Id.* at 412-13.

241. *Id.* at 413.

242. *Id.* at 414.

243. *Id.*

244. 521 F.2d 771 (8th Cir. 1975).

245. *Id.* at 774.

246. 609 S.W.2d 346 (Ark. 1980).

247. *Id.* at 351.

interpretation that the rule of capture should not be extended insofar as operations relate to lands lying within the peripheral area affected, we, however, are holding that reasonable and necessary secondary recovery processes of pools of transient materials should be permitted, when such operations are carried out in good faith for the purpose of maximizing recovery from a common pool. The permitting of this good faith recovery process is conditioned, however, by imposing an obligation on the extracting party to compensate the owner of the depleted lands for the minerals extracted in excess of natural depletion, if any, at the time of taking and for any special damages which may have been caused to the depleted property.²⁴⁸

This stated measure of damages is unclear, but it appears to require the waterflooding party to account for production drained from the plaintiff's property that is attributable to the enhanced-recovery operations. Presumably, this would be for net profits. The court did not elaborate on how such damages should be determined or which party should carry the burden of proof, but presumably, such burden would rest with the plaintiff.

When a regulatory agency approved a plan of unitization and when the plaintiff had rejected a fair and reasonable offer to participate in the plan, the Nebraska Supreme Court found that no trespass results from waterflooding.²⁴⁹ However, the court did indicate that the plaintiff may be entitled to recover any profits that he could prove would have been realized through continued primary recovery operations unfettered by the neighboring unitized operations in which he had declined to participate.²⁵⁰ Note the difference in the measure of damages in this case from the measure articulated by the Arkansas Supreme Court in *Jameson*.²⁵¹ In Nebraska, a plaintiff may recover damages for profits that would be derived from his own primary-recovery operations. In Arkansas, a plaintiff appears to be able to recover damages for the amount of production drained from her land by neighboring secondary- or enhanced-recovery operations in excess of what would have been drained by primary-recovery operations.

Of these cases, *Manziel*, which cites the rule of capture to deny liability, and *Crawford*, which recognized the importance of not allowing trespass law to inhibit the use of secondary- and enhanced-recovery operations, are the preferable rulings. But, in the case of an ongoing injection operation for enhanced recovery, I submit that, to avoid liability, the injecting operator should act under regulatory authority and make affected mineral owners a fair and reasonable offer to participate. If a regulatory permit is issued, if a fair and reasonable offer is rejected, and if no actual damage other than drainage occurs, then the operator

248. *Id.*

249. *Baumgartner v. Gulf Oil Corp.*, 168 N.W.2d 510, 516 (Neb. 1969).

250. *Id.* at 519.

251. *See supra* note 247 and accompanying text.

should be shielded from liability under the rule of capture. These prerequisites do not need to be extended to hydraulic fracturing because it is a well-completion technique designed to facilitate and maximize primary recovery from a single well and unit, and the operation is neither ongoing nor a secondary-or enhanced-recovery technique.²⁵²

G. Subsurface Trespass Resulting from the Subsurface Storage of Natural Gas

Natural gas is frequently injected into the subsurface for temporary storage. If such gas migrates beneath neighboring lands, then trespass issues arise, but the focus of most cases is on the ownership of the migrated gas, not the trespass itself. Moreover, in most jurisdictions, pipeline companies and gas utilities have established and operated gas-storage reservoirs, and they possess and often exercise the right of eminent domain—usually acquiring rights to the entire reservoir.

One early case that did focus on the trespass was the Kentucky case, *Hammonds v. Central Kentucky Natural Gas Co.*²⁵³ The court foolishly reasoned that natural gas injected for storage was really released back to nature—in essence, abandoned.²⁵⁴ Because the gas was abandoned, the gas had no owner and was once again subject to the rule of capture.²⁵⁵ Comparing injected gas to the release of captured wild animals, the court accordingly found that no trespass occurred when the released gas migrated to neighboring property because the injecting party no longer held title to the gas.²⁵⁶ In Kansas, the reasoning of *Hammonds* has been followed in the following circumstance: “where a natural gas utility was not involved, where no certificate authorizing an underground natural gas storage facility had been issued by the Kansas Corporation Commission, and where a landowner had used the property of an adjoining landowner for gas storage without authorization or consent.”²⁵⁷

252. *Cf.* Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1 (2008).

253. 75 S.W.2d 204 (Ky. Ct. App. 1934), *partially overruled by* Tex. Am. Energy Corp. v. Citizens Fidelity Bank & Trust, 736 S.W.2d 25, 28 (Ky. 1987).

254. *Hammonds*, 75 S.W.2d at 205-06.

255. *Id.*

256. *Id.* at 206.

257. Union Gas Sys., Inc. v. Carnahan, 774 P.2d 962, 967 (Kan. 1989); *see also* Anderson v. Beech Aircraft Corp., 699 P.2d 1023, 1032 (Kan. 1985). These cases were distinguished in *Reese Exploration, Inc. v. Williams Natural Gas Co.*, 983 F.2d 1514, 1523 (10th Cir. 1993).

Parties having the power of eminent domain may protect their rights by securing a state certificate and by condemning the reservoir, and such parties are further protected from the rule of capture if they can prove by a preponderance of the evidence that injected gas had migrated to adjoining property or to a stratum that has not been condemned. *See* KAN. STAT. ANN. §§ 55-1205 to 1210 (2007); *Williams Natural Gas Co. v. Supra Energy, Inc.*, 931 P.2d 7 (Kan. 1997); *Union Gas*, 774 P.2d at 967. For the meaning of “adjoining,” *see N. Natural Gas Co. v. Nash Oil & Gas, Inc.*, No. 04-1295-JTM, 2005 U.S. Dist. LEXIS 10181, at *7 (D. Kan. May 16, 2005). If gas migrates into another stratum, further condemnation may be pursued, but landowners’ damages for the pre-condemnation trespass and unjust enrichment are measured by the fair rental value of such stratum. *Beck v. N.*

In *Oklahoma Natural Gas Co. v. Mahan & Rowsey, Inc.*,²⁵⁸ the court implicitly concluded that the injector retains title to injected gas that migrated to other lands.²⁵⁹ However, evidence showed that the gas was confined to an identifiable and well-defined formation and that the gas was distinguishable, due to helium content and lack of certain organic compounds, from native gas in the area.²⁶⁰ Under Oklahoma statutory law, a public utility may acquire underground gas storage rights by condemnation.²⁶¹ Under this statutory law, injected gas remains the property of the injector, even if the gas migrates beneath other lands, provided that the injector can prove migration and also that the injector compensates the owner of the invaded stratum.²⁶²

Texas wisely rejected the reasoning of *Hammonds* in *Lone Star Gas Co. v. Murchison*,²⁶³ finding that injected natural gas is not abandoned but remains the personal property of the injecting party and as such, is no longer subject to capture by neighboring landowners even if the gas migrates beneath neighboring tracts.²⁶⁴ Of course, since the injector still owns the injected gas, the question of trespass arises. In *Murchison*, the gas-storage company had acquired the right to store natural gas in what was thought to be a well-defined subsurface reservoir, but the gas actually migrated beyond the assumed reservoir limits to a neighboring subsurface property.²⁶⁵ Because the storage company retained title to migrated gas as personal property, the court concluded the gas was not subject to the rule of capture.²⁶⁶ This ruling aligns with surface migration of oil that migrates to neighboring properties after spills or leaks.²⁶⁷ Neither *Murchison* nor any other Texas case squarely addresses the trespass question, and no case addresses injunctive relief for what is a continuing trespass.²⁶⁸ This dearth of authority implicitly supports my argument that actual and substantial subsurface damages

Natural Gas Co., 170 F.3d 1018, 1024 (10th Cir. 1999).

258. 786 F.2d 1004 (10th Cir. 1986).

259. *Id.* at 1006-07.

260. *Id.* at 1007.

261. OKLA. STAT. ANN. tit. 52, § 36.3 (West 2000).

262. OKLA. STAT. ANN. tit. 52, § 36.6 (West 2000).

263. 353 S.W.2d 870 (Tex. Civ. App. 1962).

264. *Id.* at 880; *see also* *White v. N.Y. State Natural Gas Corp.*, 190 F. Supp. 342 (W.D. Pa. 1960); *Pac. Gas & Elec. Co. v. Zuckerman*, 234 Cal. Rptr. 630 (Ct. App. 1987); *Humble Oil & Ref. v. West*, 508 S.W.2d 812, 817 (Tex. 1974).

265. *Murchison*, 353 S.W.2d at 871-72.

266. *Id.* at 880.

267. *See, e.g., Champlin Exploration, Inc. v. W. Bridge & Steel Co., Inc.*, 597 P.2d 1215, 1216-17 (Okla. 1979).

268. In *Murchison*, the court observed:

Appellees expend a great deal of space in their brief to the argument that appellant has trespassed upon their property. The status of this record is such, however, that we must, as Ulysses "lash ourselves to the mast and resist Siren's songs" of trespass, or similar contention. This, for the simple reason that no action seeking redress or claimed trespass is here presented.

353 S.W.2d at 875.

should be required for a trespass action to lie in these circumstances. However, the dearth of case authority may also be due to the fact that gas-storage reservoirs may be acquired by eminent domain²⁶⁹ and trespass allegations are often treated as an action in inverse condemnation.²⁷⁰

In *ANR Pipeline Co. v. 60 Acres of Land*,²⁷¹ a federal court in Michigan, in dicta, stated that “if injected gas moves across boundaries there may be a trespass.”²⁷² However, the court held that migration of non-native gas to a neighboring property does not give rise to a claim of inverse condemnation.²⁷³

Few reported cases address actual damages resulting from stored gas that migrates to the subsurface of nearby property. The Kansas Supreme Court has rendered three decisions concerning personal injury and property damage arising when stored gas migrated from an underground storage reservoir and eventually vented at the surface in downtown Hutchinson, Kansas.²⁷⁴ The leak culminated in a massive explosion of natural gas in the heart of the city, killing several people and destroying several businesses.²⁷⁵ The first opinion dealt with an award of negligence and punitive damages for losses suffered by a particular business.²⁷⁶ The last two opinions dealt with unsuccessful class-action suits.²⁷⁷ Significantly, in one of these class actions, the court denied recovery of damages for “diminution in the property’s market value caused by the stigma or market fear resulting from an accidental contamination where the property owner has not proved either a physical injury to the property or an interference with the owner’s use and enjoyment.”²⁷⁸ This holding supports my argument that landowners should not be able to recover damages for mere speculative value in the case of a subsurface trespass.

In one case involving the subsurface storage of freshwater, *Board of County Commissioners v. Park County Sportmen’s Ranch, L.L.P.*,²⁷⁹ the Colorado Supreme Court held that storing freshwater in an aquifer does not constitute a trespass against neighboring landowners when

269. See, e.g., *Pac. Gas & Electric Co. v. Zuckerman*, 234 Cal. Rptr. 630 (Ct. App. 1987); *Iroquois Gas Corp. v. Gernatt*, 281 N.Y.S.2d 896 (N.Y. App. Div. 1967).

270. See, e.g., *Columbia Gas Transmission Corp. v. Exclusive Natural Gas Storage Easement*, 747 F. Supp. 401 (N.D. Ohio 1990).

271. 418 F. Supp. 2d 933 (W.D. Mich. 2006).

272. *Id.* at 940.

273. *Id.* at 941.

274. See *Gilley v. Kan. Gas Serv. Co.*, 169 P.3d 1064 (Kan. 2007); *Smith v. Kan. Gas Serv. Co.*, 169 P.3d 1052 (Kan. 2007); *Hayes Sight & Sound, Inc. v. ONEOK, Inc.*, 136 P.3d 428, 433-34 (Kan. 2006).

275. *Hayes Sight & Sound*, 136 P.3d at 433-34.

276. *Id.*

277. *Gilley*, 169 P.3d 1064; *Smith*, 169 P.3d 1052.

278. *Smith*, 169 P.3d at 1059.

279. 45 P.3d 693 (Colo. 2002).

there was no physical invasion of neighboring lands by directional drilling or occupancy by recharge structures or extraction wells.²⁸⁰ In addition, the court concluded that such use of an aquifer does not require the user to acquire storage rights by eminent domain or require the payment of compensation.²⁸¹ Because this is a water case arising in Colorado, it does not assist my argument. As the court observed: "[B]y reason of Colorado's constitution, statutes, and case precedent, neither surface water, nor ground water, nor the use rights thereto, nor the water-bearing capacity of natural formations belong to a landowner as a stick in the property rights bundle."²⁸²

V. CONCLUSION

If traditional surface trespass law is applied to the subsurface, numerous subsurface uses could be greatly hindered, if not made impracticable. These include the injection of substances for enhanced recovery of oil, gas, brine, and other native fluids; the injection of fluids and proppants in the course of hydraulic fracturing of tight oil and gas reservoirs; the underground injection of natural gas for storage; the underground injection of wastes for disposal, including saltwater disposal relating to hydrocarbon exploitation; underground geologic carbon sequestration to decrease the emission of greenhouse gases into the atmosphere; and the gathering of subsurface information through various kinds of exploration activities, particularly, conventional and 3-D seismic surveys and aerial magnetic surveys. In addition, underground waste may occur if the mineral owner of Blackacre can be barred by a neighboring owner of a severed mineral interest (Whiteacre) from using the surface and subsurface of Whiteacre to access his mineral resources beneath Blackacre.²⁸³ Although each of these activities, excluding seismic and aerial surveys, can lead to the physical migration of substances beneath neighboring property, they should not give rise to actionable trespass without a showing of actual and substantial harm other than drainage.

The reason for my argument is simple: The subsurface invasions listed above meet important societal needs, which must be commercial (economically efficient) if they are to succeed. A strict application of trespass law to the subsurface, particularly the ability to enjoin a continuing trespass, could in some, perhaps many, instances make the dif-

280. *Id.* at 710.

281. *Id.* at 715.

282. *Id.* at 707.

283. I do believe that the surface owner of Whiteacre must consent to such use.

ference between an economic and uneconomic enterprise.²⁸⁴

I hasten to point out that all of the above subsurface uses, except perhaps hydraulic fracturing are, or are likely to become, regulated activities. Even hydraulic fracturing requires a well permit, and this activity could become more heavily regulated in the future. Subsurface injections should be regulated to prevent waste and to help assure that such uses will be economic. In addition, a key reason for regulation should be to prevent such activities from causing real harm to the subsurface, including freshwater and mineral resources. A strict trespass rule—one that would require injectors to obtain permission from all affected land and mineral owners—would do little to safeguard against actual subsurface harm, as such owners will often not be able to assess the likelihood of harm and will likely be primarily concerned with the compensation received for the sale of the injection rights. While such a requirement might make it less likely that subsurface injection activities would occur in a particular area (for example, an area of small-tracts and fractional ownerships), the result could be that less suitable subsurface might be used in another area (for example, an area where only a few owners controlled large tracts).

With the exceptions already noted in this article, I conclude that courts should not allow subsurface trespass claims unless the plaintiff shows substantial and actual damages. Moreover, subject to the limited exceptions already noted, courts should deny injunctive relief for subsurface trespass.

284. Regarding the implications of having to compensate landowners for geologic carbon sequestration, see generally R. Lee Gresham et. al., *Implications of Compensating Property-Owners for Geologic Sequestration of CO₂*, ENVTL. SCI. TECH. ___ (forthcoming 2010).