

Revised March 20, 2002

UNITED STATES COURT OF APPEALS
FIFTH CIRCUIT

No. 00-50710

JESS ANTHONY; MARJORIE ANTHONY; LINDA FORBUSH,

Plaintiffs - Appellants,

versus

CHEVRON USA, INC., Successor in Interest to Gulf Oil
Corporation,

Defendant - Appellee.

Appeal from the United States District Court
For the Western District of Texas

March 1, 2002

Before JONES, EMILIO M. GARZA, and STEWART, Circuit Judges.

EMILIO M. GARZA, Circuit Judge:

Plaintiffs-Appellants Jess Anthony, Marjorie Anthony, and Linda Forbush (collectively, the “Anthony Family”) appeal the district court’s grant of judgment as a matter of law in favor of Defendant-Appellee Chevron U.S.A., Inc. (“Chevron”). The Anthony Family filed suit in state court against Chevron and several other oil companies, alleging that Chevron had negligently polluted both

the water and soil of the Anthony Family's ranch, and also used more of the ranch's surface estate than was reasonably necessary to conduct their operations. After the dismissal of the sole non-diverse defendant, Chevron removed the case to federal court pursuant to 28 U.S.C. § 1446(b).¹ The district court subsequently denied the Anthony Family's claims on the merits, holding that they had failed to provide sufficient evidence for a reasonable jury to conclude that Chevron caused the pollution of the ranch's underground aquifer. The trial court also concluded that the Anthony Family had not shown sufficient evidence that Chevron caused the soil pollution on various sites on the ranch. In addition, the court found that the Anthony Family had not presented sufficient evidence to calculate the amount of damages resulting from the alleged water and soil pollution. We agree with the district court, and hold that the Anthony Family has failed to provide sufficient evidence of causation and damages to reach the jury on either the water or soil pollution claims.²

I

The Anthony Family owns the surface estate of the V-6 ranch, which encompasses 7,392 acres south of the City of Monahans in Ward County, Texas. As part of their surface estate, the Anthony Family owns the groundwater underlying the ranch. The ranch's mineral estate is separate

¹28 U.S.C. § 1446(b) provides, in relevant part:

If the case stated by the initial pleading is not removable, a notice of removal may be filed within thirty days after receipt by the defendant, through service or otherwise, of a copy of an amended pleading, motion, order or other paper from which it may first be ascertained that the case is one which is or has become removable, except that a case may not be removed on the basis of jurisdiction conferred by section 1332 of this title more than 1 year after commencement of the action.

28 U.S.C. § 1446(b).

²Chevron raises several other grounds in support of the district court's dismissal of the Anthony Family's water and soil pollution claims. Because we find for Chevron on the elements of causation and damages, we do not need to reach these additional issues.

from the surface estate and is divided into two sections. The Gulf Oil Corporation (“Gulf”) initially leased these two sections from the Hutchings Joint Stock Association (“H.S.A.”) and from the trustees of the C.W. Edwards estate in 1925 and 1934, respectively. The leases gave Gulf the exclusive right to conduct oil production operations on each subsection of the ranch. Chevron subsequently acquired these leaseholds over the mineral estate when it acquired Gulf. Chevron continued to operate under the lease agreements until it assigned them to the Pennzoil Company (“Pennzoil”) in 1992.

Underlying the V-6 ranch is the Allurosa aquifer. The Allurosa, in reality, consists of two distinct, but interconnected aquifer layers. The uppermost layer, known as the Alluvium, consists primarily of poorly consolidated sand, gravel, and silt. This upper strata extends down roughly one hundred feet below the surface. Beneath the Alluvium is the Santa Rosa aquifer, which extends down a further two hundred fifty feet below the surface, making the total depth of the aquifer approximately three hundred fifty feet. The Santa Rosa, which consists of sandstone, is older and harder than the upper, Alluvium layer. The name “Allurosa” is merely a contraction of the names of these two subterranean aquifers.

The Anthony Family maintains numerous water wells on their ranch, each of which is completed into the Allurosa aquifer. The particular well at issue here, known as the Bentley Windmill water well, extends down only into the upper Alluvium strata to a depth of about fifty-four feet. The Anthony Family uses this well to provide water for their cattle on the ranch. The well produces approximately ten gallons of water per minute, but the portion of the Allurosa beneath the well is capable of producing several hundred gallons per minute if the Bentley Windmill’s pumping capacity was increased or additional wells were completed into the aquifer.

Historically, the Bentley Windmill produced water that was suitable for human consumption. Tests run in 1973, 1974, and 1975 showed chloride levels in the Bentley Windmill at about sixty parts per million (p.p.m.) and total dissolved solids of approximately 600 p.p.m., which were far below the recommended maximum state levels for chloride and total dissolved solids in drinking water of 300 p.p.m and 1,000 p.p.m., respectively.

By 1988, the chloride levels in the Bentley Windmill had increased dramatically. Tests revealed chloride levels as high as 980 p.p.m., far in excess of the recommended maximum level of chloride for drinking water. Not surprisingly, the level of total dissolved solids had also increased substantially, also exceeding the recommended maximum amount.

Beneath the Allurosa is the Monahans South Queen Field (“South Queen”), part of the mineral estate, which consists primarily of sand saturated with oil. The South Queen lies at a depth of about 3,000 feet below the surface. Chevron initially began to develop the South Queen in the late 1960s. Beginning in 1971, Chevron sought to increase the oil production from the field by injecting salt water into the formation. For this purpose, Chevron converted several of its oil producing wells into salt water injection wells. The goal of this procedure was to increase the underground pressure, thereby forcing more oil towards the remaining producing wells. Some of these converted wells were in close proximity to the Bentley Windmill. Chevron had plugged and abandoned all of its producing and injection wells in the vicinity of the Bentley Windmill by 1989, three years before it assigned the mineral lease to Pennzoil.

As part of its oil production activities on the V-6, Chevron operated numerous production wells and several pipelines. The Anthony Family alleges that oil spills or leakage are evident at eight locations near wells or pipes that, at least at some point in time, were owned and operated by

Chevron. Three of these contaminated sites are located on the west side of the V-6 ranch. Chevron ceased operations on that portion of the ranch in 1992. Subsequently, several different oil companies operated the well and pipe facilities in the area. Chevron, however, continues to produce oil on the east side of the ranch where the remaining five contamination sites are located.

At trial, the Anthony Family claimed that Chevron's negligent operations caused both the elevated chloride levels in their well, as well as the soil contamination on their ranch. They also claimed that Chevron utilized more of the surface estate than reasonably necessary to carry out its oil operations.³ At the close of the Anthony Family's case, Chevron moved for judgment as a matter of law pursuant to FED.R.CIV.P. 50(a). The district court concluded that the Anthony Family's evidence failed to establish that Chevron caused the contamination on the ranch and was critically short of the proof necessary to establish an amount of damages. Thus, the trial court granted Chevron's Rule 50 motion. On appeal, the Anthony Family argues that the district court erred in granting this motion, contending that they presented sufficient evidence of causation and damages for a jury to consider Chevron's liability for both the water and soil pollution on their ranch.

II

Under the standard articulated in FED.R.CIV.P. 50(a), a district court properly grants a motion for judgment as a matter of law only when "a party has been fully heard on an issue and there is no legally sufficient evidentiary basis for a reasonable jury to find for the party on that issue." FED.R.CIV.P. 50(a); *see Reeves v. Sanderson Plumbing Prods., Inc.*, 530 U.S. 133, 149 (2000). In

³In addition to these claims, the Anthony Family sued Chevron for nuisance, breach of implied covenants, unjust enrichment, conversion, and fraud. The Anthony Family does not pursue these claims on appeal and therefore we deem them waived. FED.R.APP.P. 28(a)(9)(A); *Yohey v. Collins*, 985 F.2d 222, 225 (5th Cir. 1993) (holding that arguments must be included in the original appellate brief in order to be preserved).

turn, we review a district court's Rule 50 determination de novo, "applying the same legal standard as the trial court." *Cooper Indus., Inc. v. Tarmac Roofing Sys., Inc.*, 276 F.3d 704, 707 (5th Cir. 2002) (quoting *Flowers v. So. Reg'l Physician Servs. Inc.*, 247 F.3d 229, 235 (5th Cir. 2001)).

In order to survive a Rule 50 motion and present a question for the jury, the party opposing the motion must at least establish a conflict in substantial evidence on each essential element of their claim. *Boeing Co. v. Shipman*, 411 F.2d 365, 374 (5th Cir. 1969) (en banc) (holding that a mere scintilla of evidence is insufficient to present a question for the jury). In other words, the evidence must be sufficient so that a jury will not ultimately rest its verdict on mere speculation and conjecture. *Gulf Coast Real Estate Auction Co. v. Chevron Indus., Inc.*, 665 F.2d 574, 577 (5th Cir. 1982). In determining whether there is a jury question, the court should consider all the evidence presented at trial in the light most favorable to the non-moving party. *Mattern v. Eastman Kodak Co.*, 104 F.3d 702, 705 (5th Cir. 1997).

In the present case, the Anthony Family alleges that Chevron's negligent oil operations contaminated the ranch's underground aquifer with salt water. The Anthony Family also claims that Chevron's operations resulted in oil spills or leakage at eight separate sites on the V-6. Chevron, as the holder of an oil and gas lease, has the legal right under Texas law to use as much of the surface estate as is reasonably necessary to comply with the terms of the lease and to carry out its purposes. *Oryx Energy Co. v. Shelton*, 942 S.W.2d 637, 641 (Tex. App.--Tyler 1996, no writ). Thus, for the Anthony Family to recover, they must establish that this water and soil contamination was the result of either Chevron's specific acts of negligence or Chevron's use of more of the Anthony Family's surface estate than reasonably necessary to carry out its oil operations. *Humble Oil & Ref. Co. v. Williams*, 420 S.W.2d 133, 134 (Tex. 1967).

In order to establish a negligence claim under Texas law, the Anthony Family must prove four elements: (1) that Chevron owed a specific duty to them, (2) that Chevron breached that duty, (3) that Chevron's breach caused their injury, and (4) that they suffered damages as a result of that breach. *Mosley v. Excel Corp.*, 109 F.3d 1006, 1009 (5th Cir. 1997). Similarly, in order to demonstrate that Chevron used more of the surface estate of the ranch than reasonably necessary to carry out its oil-field operations, the Anthony Family must establish that Chevron caused the contamination of their surface estate and that this unreasonable use actually damaged their ranch. *Hess v. McLean Feedyard, Inc.*, 59 S.W.3d 679, 684 (Tex.App.--Amarillo 2000, pet. denied) (explaining that causation is "essential element of any claim . . . whether sounding in tort, trespass, or otherwise"); *Riojas v. Lone Star Gas Co.*, 637 S.W.2d 956, 959 (Tex.App.--Fort Worth 1982, writ ref'd n.r.e.) (holding that there can be no recovery by a party unless the injuries or damages were caused by the actions of the other party). Thus, the analysis of the Anthony Family's negligence and "unreasonable use" claims is identical for purposes of this appeal.

The relevant issues in this appeal are causation and damages.⁴ Specifically, we must consider whether the Anthony Family has presented sufficient evidence such that a reasonable jury could find that Chevron caused either the water or soil contamination on the V-6 ranch and, if so, whether the

⁴The district court concluded that if the Anthony Family had presented sufficient evidence of causation and damages, the evidence of Chevron's negligence and "unreasonable use" would have been sufficient to go to the jury. Because we conclude that the Anthony Family has failed to establish causation and damages, we do not need to decide any issues regarding Chevron's potential liability under either theory. *E.g., Wheaton Van Lines, Inc. v. Mason*, 925 S.W.2d 722, 728 (Tex.App.--Fort Worth 1996, writ denied) (explaining that "[i]n any cause of action, whether grounded in tort, contract, or a hybrid of the two, there can be no recovery of damages by an aggrieved party against another unless the injuries or damages were caused by the other's actions."); *Riojas*, 637 S.W.2d at 959 (holding that "according to requirements of applicable law, 'causation' is always an essential element to attribute fault for one's injuries to another").

Anthony Family has established damages with sufficient certainty so as to permit the jury to calculate an amount without resorting to speculation or conjecture. Because the Anthony Family's water contamination and soil pollution claims are distinct, we will address them separately.

III

The Anthony Family first contends that Chevron's operations contaminated the ranch's underground aquifer with salt water. The Anthony Family relied primarily on the testimony of two expert witnesses, Scott Epley and Thomas Kelly, to prove that Chevron did in fact pollute their water well. Despite their extensive testimony, neither witness presented sufficient evidence showing that Chevron caused the pollution of the aquifer or the extent of the damages resulting from that contamination to permit those issues to reach the jury.

A

Scott Epley's testimony primarily attempted to explain how the salt water that Chevron injected into the South Queen managed to reach the Allurosa aquifer one-half mile above the injection zone. Epley proposed three different ways in which the injected water could flow up to the fresh water aquifer and contaminate the Bentley Windmill well. Although Epley's theories present descriptions of what possibly caused the contamination, he has not offered sufficient evidence to support any of these models. Without such an underlying factual basis, a reasonable jury could not conclude that it was more likely than not that Chevron actually caused the pollution in the Allurosa.

Epley's first theory focuses on the fact that, during the course of their operations, Chevron injected more salt water into the South Queen than the oil and water mixture it eventually removed. Chevron had in fact introduced approximately twenty-one million extra barrels of salt water into the South Queen formation. Epley then presented evidence that the South Queen was, in effect, a closed

system. Thus, according to Epley, Chevron's injections were increasing the pressure of the liquid stored in the underground oil container. Eventually, the South Queen could no longer hold the excess liquid. Epley claimed that the wells extending into the field acted like straws, drawing up the surplus water from the South Queen. As the pressure increased, the injected salt water began to vertically migrate up along the well casings of the various injection and production wells in the area. Epley opined that the pressure at which Chevron injected the water was sufficiently great to force it to flow all the way up to the Allurosa aquifer more than 2,000 feet above.

Epley's theory hinges on the fact that the excess salt water injected into the South Queen raised the pressure to such a level that the water was forced to the surface. The only evidence presented, however, to prove that this actually occurred is that Chevron injected more fluid than they removed. Epley never established the size of the underground oil reservoir or how much it could hold and, in fact, testified that it had no bearing on his pressure calculations. Instead, he claimed that because the South Queen had reached an equilibrium point in 1971, any additional water must necessarily increase the pressure on the container.

Epley's contention that the actual volume of the South Queen is irrelevant to his pressure calculations confuses equilibrium with saturation. For Epley's account to be accurate, the South Queen would have to be at its maximum capacity when Chevron began to remove oil from the field in the late 1960s. Epley never testified to that fact. Rather, he admitted that the South Queen could contain voids and gases that could be compressed to make additional space for the excess salt water. Thus, according to Epley's own testimony, it is possible that the South Queen container could hold the excess twenty-one million barrels of injected water in addition to the initial quantity of oil that it contained. Moreover, because Epley's meticulous calculations establishing that sufficient pressure

existed to force the injected water to the surface were based solely on injection pressures recorded at the surface and not upon actual underground pressure readings, these calculations depended on the assumption that the South Queen was saturated. Thus, even if the South Queen could not hold all of the excess 21 million barrels of water injected by Chevron, Epley's own testimony undermines his conclusion that the underground pressure was sufficiently great to force the injected water upwards to the Allurosa. Even when considering all the evidence presented at trial in the light most favorable to the Anthony Family, Epley's testimony regarding this theory merely established what could have occurred. The jury, however, would be asked to speculate as to both the size of the South Queen container and the actual pressure of the underground water. Thus, there is insufficient evidence to reach a jury.

The second model posited by Epley involves the horizontal flow of injected salt water from one of Chevron's injection wells to one of its nearby producing wells, eventually resulting in the contamination of the fresh water aquifer. Epley claimed that both of these point sources contributed to the pollution in the Allurosa. Epley testified that H.S.A. #648, an injection well situated directly to the north and west of the Bentley Windmill, developed integrity problems in its well casings. The holes in the well casings allowed salt water to begin to migrate vertically back towards the surface as well as flow horizontally toward a nearby producing well. Although Chevron had placed concrete around the casing of the producing well below 2,300 feet, Epley claimed that the salt water from H.S.A. #648 was flowing into the producing well above this concrete shield. Thus, Epley opined that the injected water could easily migrate to the surface along the producing well's casings, following the path of least resistance. Moreover, Epley argued that H.S.A. #648, itself, was improperly plugged, again permitting the pressurized injection water to migrate upwards into the Allurosa.

Once more, while Epley establishes a potential source of the pollution in the Allurosa, his testimony falls short of the level required to make out the Anthony Family's prima facie case as to causation. To support his theory, Epley relies solely on temperature logs taken from Chevron's files. These documents revealed that there was water leaking from H.S.A. #648 through numerous holes in its well casings from 2,016 feet to 1,924 feet below the surface. Subsequent tests revealed additional water at 1,590 feet below the surface. The documents never established, however, that this leaking water ever migrated upwards into the fresh water zone or flowed horizontally to Chevron's producing well. At best, the documents put the injected salt water nearly 1,300 feet below the Allurosa.

Although the Anthony Family correctly asserts that it is not necessary for them to prove beyond a reasonable doubt that this injected water actually contaminated their well, something more than the beginnings of a leak and the end result of a polluted well nearby is necessary to establish causation. In order to prove causation, the well could have presumably been tested or a separate test well could have been dug in the vicinity of these point sources to search for higher pollution content or underground water flows. In short, the Anthony Family should have provided the jury with some factual link between the leaks one-third of a mile from the Allurosa and the ultimate fact of contamination. Without such evidence, the jury would be forced to speculate, as Epley ultimately did in his testimony, that such a pathway in fact existed.

Epley's final theory of contamination suffers from the same problems as his first two pollution models. This last theory focuses on two wells, H.S.A. #663 and #643, which are situated to the south and east of the Bentley Windmill. Chevron intentionally injected highly pressurized salt water into these wells in order to fracture the rock surrounding the South Queen. Sand was then injected into

these fissures to hold them in place. These water and sand injections were an attempt to create more permeable pathways for the oil trapped in the surrounding rock strata to flow towards Chevron's producing wells. Epley presented evidence, again from Chevron's own documents, that these injections resulted in fractures extending out of the South Queen and upwards towards the Allurosa aquifer.

Epley's testimony once again outlines another possible way the Allurosa and the Bentley Windmill were contaminated. His testimony again fails to provide sufficient evidence for a reasonable jury to conclude that this possibility was more likely than not what actually occurred. Epley never bridges the glaring gap between the initial "out-of-zone" fracture and the resulting contamination. The initial injection fracture extended only 166 feet upwards from the South Queen field. Epley then merely speculates that these fractures continued as Chevron injected water over several years. His theory is based on the fact that Chevron continued to inject water at higher pressures than necessary to fracture the surrounding rock. The Anthony Family's own exhibits, however, state that Chevron ceased to inject water into H.S.A. #663 and plugged and abandoned that well in 1975, before the Bentley Windmill was contaminated. Chevron did continue to inject water through H.S.A. #643. Epley, however, provided no evidence showing that the fracture at H.S.A. #643 extended further than its initially observed length of 166 feet. Moreover, these later injections were no longer directed at intentionally creating new pathways to the oil in the surrounding rocks, but rather were part of Chevron's regular injection operations. Again, there is an initial fracture, but no evidence linking that fracture to the freshwater zone some 1,500 feet above.

Taken as a whole, Epley's testimony raises suspicions about Chevron's operations in the area. This alone, however, is not enough to present a question of fact to the jury on the issue of causation.

Each one of the models presented by Epley provides a plausible theory of how the Bentley Windmill was contaminated. The evidence upon which each of Epley's theories is based, however, is fundamentally lacking. He has not provided any evidence establishing the nexus between Chevron's water injection operations and the pollution in the Allurosa. Moreover, despite the fact that there are numerous oil companies operating within the general area of the Bentley Windmill, Epley's testimony, coupled with Thomas Kelly's testimony that aquifers move like horizontal streams under the ground, failed to address the possibility that other sources caused the salt water contamination. Without any examination of the surrounding area or any field tests, it is impossible to know whether Epley accurately identified the source of the pollution in the Allurosa. Given the evidence presented, we cannot conclude that a reasonable jury could find that it is more likely than not that Chevron's oil operations caused the contamination to the Bentley Windmill.

B

The Anthony Family also presented the testimony of Thomas Kelly. Although Epley's testimony focused on how the injected water traveled from the South Queen upwards to the Allurosa, Kelly's testimony addressed what happened to the salt water once it actually reached the aquifer. Kelly first testified that when the salt water pollution reached the aquifer, it would expand in a tear drop shape. He characterized the path of the salt water as a plume, spreading through the aquifer. Kelly then testified as to the direction and speed at which the water in the Allurosa, as well as the salt water plume, was flowing. Based on existing well information, as well as data gleaned from pumping water at the Bentley Windmill for a twenty-four hour period, Kelly concluded that water in the immediate vicinity of the Bentley Windmill was flowing from northwest to southeast at a rate of thirteen feet per day. Thus, any pollution coming from the injection and production wells to the north

and west of the Bentley Windmill would contaminate the well. Two of the potential pollution sources identified by Epley in his testimony, H.S.A. #643 and #663, were situated to the south and east of the well. Kelly claimed, however, that the pollution from these point sources could also contaminate the Bentley Windmill. He testified that the water well created a “zone of depression” by removing water from the aquifer. Thus, the polluted water from these wells would also be drawn towards the Bentley Windmill site.

Kelly’s testimony is sufficient to support a finding that salt water supposedly coming from the nearby Chevron injection and production wells could have reached the Bentley Windmill. In its decision, the district court focused on the fact that Kelly’s tests revealed that the groundwater was flowing at different rates and in a different direction than those observed in a published geological survey of the area. Kelly, however, testified that his measurements differed from the regional study because it focused on a more limited area around the Bentley Windmill. Kelly’s explanation for this discrepancy appears coherent. It is the role of the jury to weigh his evidence against the geological survey data, and we accept his findings as correct for the purposes of our review.

Nevertheless, Kelly’s findings do not establish causation. Other than the pump tests he conducted, Kelly did not perform any additional field tests to determine the source of the pollution. Instead, he relied on Epley’s assumption that Chevron’s wells in the area were the cause of the contamination. Having made no independent verification of this fact, his testimony cannot support a finding that Chevron caused the contamination in the Bentley Windmill.⁵

⁵Kelly’s testimony may even undermine Epley’s account. If the underground water is moving through the aquifer at a rate of thirteen feet per day, then it could travel up to 4,745 feet per year. According to tests the Anthony Family conducted on the Bentley Windmill, the salt water could conceivably have had as much as twenty years to travel from its source. Therefore, the pollution could be from sources almost twenty miles away.

Kelly's testimony as to the extent of the damage to the ranch's underground aquifer also suffers from several fatal defects. First, Kelly never determined the size of the contamination plume in the aquifer. He estimated that it was between one-quarter and one-half mile wide, but provided no hard data to support this testimony. Moreover, he admitted that water flows underground in different directions and at divergent speeds. Based on the data presented, the plume could have a length anywhere between two hundred feet and twenty miles. In order to begin to calculate the damages to the entire aquifer under the V-6, the jury must have more accurate information about the actual scope of the damaged area.

In addition, Kelly's own testimony revealed that the level of contamination in the Bentley Windmill was fluctuating. In 1988, the Bentley Windmill had chloride levels of 980 p.p.m. By July, 1996, that level had fallen to 410 p.p.m., only to rise back to 730 p.p.m. in 1999. This information is critical because the Anthony Family contends that the damages to the Allurosa are permanent. These fluctuating levels, combined with the fact that the underground aquifer is not stagnant, but constantly flowing, suggest the Anthony Family's contention may not be accurate. Moreover, these variations raise troubling questions because Chevron had plugged and abandoned all of its nearby wells by 1989. These variations may suggest that the contamination was dissipating or was flowing from another more remote source. Without any additional evidence, we are unable to answer these fundamental questions. Likewise, the jury would also have to speculate as to the extent of the damage to the ranch's water supply.

In sum, both Epley and Kelly provided an account of what could have occurred given the proximity of Chevron's wells and the contamination in the Bentley Windmill. They have presented no evidence, however, that the injection water ever found a pathway to the Allurosa, no evidence as

to the extent of the resulting contamination, and no evidence that the effects of the contamination are permanent. A reasonable jury could not base a finding of liability on this evidence. Chevron is entitled to judgment as a matter of law on the Anthony Family's water pollution claim.

IV

The Anthony Family also contends that Chevron negligently contaminated the soil at eight separate sites on the ranch with oil leaking from surface and underground pipes as well as nearby oil facilities. Again, the Anthony Family relies primarily on the testimony of two expert witnesses, Eddie Seay and Greg Bybee, to show Chevron's responsibility for the pollution and the extent of the applicable damages. Like the Anthony Family's evidence in support of their water pollution claims, a reasonable jury could not conclude that Chevron was responsible for the soil contamination based solely on the testimony of these two experts. A jury also could not determine the extent of any damages to the ranch based on the evidence presented without resorting to speculation.

A

Seay began his testimony by describing the methodology he used to locate the oil pollution sites on the ranch. First, he visually inspected the ranch, looking for areas devoid of vegetation and with darkened soils. Once he found these areas, he then conducted rudimentary smell tests and occasionally dug up some of the soil to determine if oil had in fact mixed into the ground at that location. Using these methods, Seay identified three contaminated sites on the west side of the ranch and five additional sites on the east side of the V-6. Seay then concluded that Chevron caused the contamination in the soil because their oil facilities were situated near all of these areas.

Seay's testimony that Chevron caused the pollution on the west side of the ranch immediately ran into problems on cross-examination. Seay admitted that he could not determine the exact date

on which the contamination occurred. He initially testified that it was likely within the last three or four years. Chevron, however, has not operated on the west side of the ranch since 1992. In the meantime, three other oil companies purchased Chevron's facilities and continuously operated them in the vicinity of the spill sites. When confronted with this information, Seay testified, conveniently, that the spills occurred in 1992. Again, he could not provide a reason for this date other than the fact that, after that year, Chevron had ceased its operations in the area.

Seay failed to present any reliable evidence that Chevron caused the soil contamination on the west side of the ranch. Seay offers no specific time frame for when the pollution occurred. What little he does offer is at best inherently inconsistent. Moreover, he admitted that it was possible that one of the other companies could have caused the spills. A reasonable jury could not find Chevron liable for the contamination on the west side of the ranch based solely on this evidence.

Seay's testimony regarding the east side of the ranch is less problematic as Chevron continues to operate in this area. Nonetheless, it still fails to link Chevron's operations to the five eastern pollution sites. Seay's primary reason for connecting Chevron to these contamination locations was that each of the five contamination sites was in close proximity to Chevron's oil lines in the area. Seay again admitted, however, that other oil companies had operations on the east side of the ranch. Moreover, at least one had experienced problems with gas lines running near to one of the pollution sites. Furthermore, Seay could not testify as to the extent of the contamination at each site or when the pollution occurred. Based on this evidence, any one of the oil company's operations could have caused the soil contamination at each of these sites. Although Seay begins to connect the soil pollution to Chevron by locating all of the sites near Chevron's operations, this alone is insufficient.

In order to present this issue to the jury, a more thorough study of the locations of each oil

company's operations and their proximity to the leaks, as well as at least some evidence that those leaks originated from Chevron's lines, is necessary.

B

In order to augment Seay's testimony as to the cause of the soil pollution, the Anthony Family retained Greg Bybee, an organic chemist, to testify as to the extent of the damage to the ranch and to establish the approximate cleanup costs for each pollution site. Bybee testified that he began his investigation by conducting a physical inspection of each contamination site. He then took soil samples from one or two points at each location at depths varying from twenty inches to seven feet six inches. In order to minimize costs, he took averages from these samples and then used the data to extrapolate the size and scope of the oil pollution in each area. Even though Bybee found varying levels of contamination at each site and took only one soil sample at a depth below seven feet, he concluded that in all probability the contamination penetrated at least seven feet into the ground at all eight sites.

Bybee's methodology appears fundamentally flawed. In essence, he took one or two isolated sample readings from each site and used it to extrapolate the overall extent of the soil pollution. His own testimony undermines the reliability of such a method. Bybee testified that the depth of the oil contamination depended on the length of time the oil had to seep into the ground as well as variations in the soil. He further testified that he could not determine the dates of any of the spills. From this testimony, it defies logic that the depth of the pollution at one point in one contamination site could provide any real evidence as to the extent of the pollution at completely unrelated locations on the other side of the V-6. Moreover, Bybee relied solely on visual observations to ascertain the perimeter of each pollution area. He then concluded that the oil pollution extended down seven feet across the

entire perimeter of each pollution site. The limited data he collected, as well as his own testimony, indicates that the oil contamination spread at variable rates. Thus, Bybee's assumption that the contamination would be at a uniform depth across the entire scope of each pollution area appears deeply troubling.

Seay's and Bybee's testimony failed to establish a legally sufficient evidentiary basis for a reasonable jury to find for the Anthony Family on essential elements of their soil pollution claims. Rather, any finding of liability would require the jurors to speculate as to both the cause of the pollution and the extent of the damage to the surface estate. Accordingly, Chevron is also entitled to judgment as a matter of law on the Anthony Family's soil contamination claims.

V

The Anthony Family has failed to present sufficient evidence establishing causation and damages such that a reasonable jury could find Chevron liable for both the water and soil pollution on the ranch. Therefore, we AFFIRM the district court's dismissal of the Anthony Family's claims. In addition, we GRANT Chevron's motion to strike the impermissible narrative reconstructions of the trial transcript contained in the Anthony Family's supplemental record excerpts.