

STATE OF LOUISIANA

COURT OF APPEAL

FIRST CIRCUIT

2018 CA 1249

PONTCHARTRAIN NATURAL GAS SYSTEM, K/D/S PROMIX, L.L.C.,
AND ACADIAN GAS PIPELINE SYSTEM

VERSUS

TEXAS BRINE COMPANY, LLC

Judgment Rendered: DEC 30 2020

Appealed from the
23rd Judicial District Court
In and for the Parish of Assumption
State of Louisiana
Docket Number 34,265

Honorable Thomas J. Kliebert, Jr., Judge Presiding

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BEFORE: HIGGINBOTHAM, PENZATO, AND LANIER, JJ.

Lanier, J.

Pontchartrain Natural Gas System, K/D/S Promix, L.L.C., Acadian Gas Pipeline System, Legacy Vulcan, LLC, Occidental Chemical Corporation, Occidental Petroleum Corporation, OXY USA Inc., and Texas Brine Company, LLC appeal a judgment determining causation, liability, and apportionment of fault for the formation of a sinkhole and the damage it caused in Assumption Parish, Louisiana.¹ For the following reasons, we reverse in part, amend in part, and affirm in part.²

FACTS AND PROCEDURAL HISTORY

On August 3, 2012, a multi-acre sinkhole opened up above the Napoleonville Salt Dome in Assumption Parish, Louisiana. Following the emergence of the sinkhole, numerous lawsuits were filed by different plaintiffs, all of whom suffered damages due to the sinkhole. An arbitration proceeding was also initiated and pursued concurrently between two parties to the litigation, Occidental Chemical Corporation and Texas Brine Company, LLC.

In this particular suit, the plaintiffs, Pontchartrain Natural Gas System, K/D/S Promix, L.L.C., and Acadian Gas Pipeline (collectively Pontchartrain), own and operate natural gas pipelines and storage facilities in the vicinity of the property affected by the sinkhole. Pontchartrain, like other affected pipeline

¹ On September 3, 2019, plaintiffs, Pontchartrain Natural Gas System, K/D/S Promix, L.L.C., and Acadian Gas Pipeline System, and defendant, Texas Brine Company, LLC, filed a joint motion to dismiss only the appeal of plaintiffs as all claims between the parties had been resolved. Therefore, we grant this joint motion and dismiss plaintiffs', Pontchartrain Natural Gas System, K/D/S Promix, L.L.C., and Acadian Gas Pipeline System, appeal only.

² We note that Texas Brine Company, LLC filed a motion to stay this appeal as well as a motion for limited remand or stay of this appeal considering the district court's per curiam in **Crosstex Energy Services, LP v. Texas Brine Company, LLC**, 34,202, 23rd Judicial District Court. We find no just reason to either stay or remand this appeal considering the district court's per curiam in a related, but still separate, case. See **Crosstex Energy Services, LP v. Texas Brine Company, LLC**, 2018-1128 (La. 10/29/18), 255 So.3d 587 (per curiam) and **Florida Gas Transmission Co. v. Teas Brine Company, LLC**, 2019-0978 (La. 6/18/19) 275 So.3d 266 (per curiam) wherein the supreme court ordered that action by the district court be taken in the **Crosstex** litigation only.

companies,³ sought to recover damages for its inoperable pipelines from Texas Brine Company, LLC (Texas Brine). Pontchartrain alleged that Texas Brine negligently operated the Oxy Geismar No. 3 Well (OG3), which collapsed and created the sinkhole.

Texas Brine responded to this lawsuit by filing incidental demands asserting tort and contract claims against various parties, including Legacy Vulcan, LLC f/k/a Legacy Vulcan Corp. and/or Vulcan Materials Company (Legacy Vulcan) and Occidental Chemical Corporation (Oxy). Texas Brine sought to recover reimbursement expenses for environmental response costs paid after the sinkhole appeared, litigation expenses and lost profits. It also asserted claims for indemnity and/or contribution for the damages allegedly sustained by Pontchartrain. Texas Brine filed amended petitions, naming additional parties and asserting additional theories of recovery, including claims against Oxy's parent company, Occidental Petroleum Corporation (Oxy Petro), and OXY USA.⁴

The district court issued a trial order on September 23, 2016, outlining four "phases" of trial. The Phase 1 liability trial was held for the purpose of determining what caused the sinkhole to form and which parties, if any, were at fault under any theory of law for causing the formation of the sinkhole. All other issues were reserved for trial in Phases 2 through 4.

³ The other pipeline companies that also filed suit against Texas Brine Company, LLC are Florida Gas Transmission Company, LLC (Florida Gas) and Crosstex Energy Services, LP, Crosstex LIG, LLC and Crosstex Processing Services, LLC (Crosstex). Although the claims are similar, the parties resisted consolidation of these three matters, except for purposes of trial as evidenced by their 2016 pretrial order. Appeals were filed in the three separate pipeline cases following the Phase 1 liability trial. Two different motions were filed with this court to consolidate all three pipeline appeals from the Phase 1 liability trial, namely **Pontchartrain**, 2018 CA 1249, **Crosstex**, 2018 CA 1391, and **Florida Gas**, 2018 CA 1425. Although this court will use the same evidence in all three appeals, we deny the motions to consolidate the 2018 CA 1249, 2018 CA 1391, and 2018 CA 1425 appeals.

⁴ Texas Brine also asserted claims against Browning Oil Company, Inc. (Browning), an operator, and Reliance Petroleum Corporation, LORCA Corporation, Colorado Crude Company, and Sol Kirschner, non-operators of an adjacent oil and gas well known as the Adams Hooker 1 Well (AH-1).

On September 18, 2017, the multiple-week Phase 1 liability trial began, wherein the following history was presented.

On July 18, 1975, Hooker Chemicals & Plastics Corporation, the predecessor-in-interest to Oxy, leased to Texas Brine the right to produce salt from a 40-acre tract of land (Salt Lease), commonly referred to by the parties as the “North 40.” The Salt Lease is situated on the western edge of the Napoleonville Salt dome in Assumption Parish, Louisiana. Within a year, Texas Brine entered into a series of interdependent contracts with Legacy Vulcan, including an “Assignment of Salt Lease,” a “Construction Contract and Facilities Lease” (Facilities Lease), and an “Operating and Supply Agreement” (Operating Agreement). The agreements provided that Texas Brine would construct and operate facilities on the North 40 and would produce and deliver a certain quantity of brine to be used by Legacy Vulcan within its chloralkali business at its Geismar facility.

Pursuant to the Facilities Lease, Texas Brine sited, drilled, and constructed the Oxy Geismar No. 2 Well (OG2) and Oxy Geismar No. 1 Well (OG1), in that order. Although the OG2 was drilled to its designed depth at over 6,000 feet, the OG1 drilled out of salt at approximately 3,680 feet, well shy of the depth contemplated in Texas Brine’s design and plans.⁵ This was the first signal to all parties involved that this particular salt dome may be irregular (i.e., with an overhang) and that the edge of the salt dome may be near. Legacy Vulcan contacted its operator, Texas Brine, to discuss this discovery and what it meant for Legacy Vulcan’s long term business venture.

In the late summer of 1976, Texas Brine retained a local geologist, Leon Toups, of Ted Hoz and Associates, to analyze available data on the North 40 in

⁵ The OG1 was “plugged” back into salt and completed as a brine well. However, this resulted in a substantially smaller cavern than originally planned, which in turn substantially decreased the OG1’s available salt reserves.

order to make certain predictions in regards to operation thereon. Mr. Toups, in a series of correspondence, advised Texas Brine that drilling another well on the North 40 would be “risky” because there was simply not enough information about the domal overhang. Mr. Toups elaborated that the “risk” consisted of not knowing whether another well could be drilled successfully and stay in salt, making it a costly gamble in a business with such trim profit margins. However, Mr. Toups suggested a location for a third well that he determined would have an excellent chance of staying in salt to an estimated depth of 7,000 feet. Mr. Toups created a map reflecting his interpretation of the dome edge and overhang, along with the placement of the wells. This information was forwarded to Legacy Vulcan by Texas Brine on November 11, 1976.

In 1978, Texas Brine strongly recommended that Legacy Vulcan drill a third well as soon as possible, predicting that the OG1 and the OG2 would be under-producing wells that could not fulfill Legacy Vulcan’s brine requirements. Legacy Vulcan hired an outside consultant, Larry Sevenker of PB-KBB, to examine the geological risks associated with adding another well on the North 40. It also asked Mark Juzsli from its commercial development division to weigh in on the issue. Mr. Juzsli concluded that Legacy Vulcan did not need another well, especially a shallow 4,000-foot well that had been suggested in a Texas Brine proposal, because it appeared to be a costly endeavor that did not provide a long-term solution to Legacy Vulcan’s brine needs. Mr. Sevenker echoed the concerns of Mr. Toups regarding the unknown salt dome edge or overhang, explaining that this posed the greatest apprehension in developing the North 40. Further, Mr. Sevenker found the OG1 to be at risk for fracture and suggested it be retired to a monitor or reserve capacity. He also suggested it was possible for Legacy Vulcan to drill more wells on the North 40, approximately five in total, but all would have to be shallower than 5,000 feet, with a narrow 150-foot diameter.

Considering the state of the OG1,⁶ and the need for brine, Legacy Vulcan agreed to drill a third well. Texas Brine and Legacy Vulcan, both armed with outside analysis, contracted to drill the OG3 in the “Drilling Agreement” dated February 2, 1982. The parties agreed to drill the OG3 to a depth of 6,000 feet. The Drilling Agreement confirmed that Texas Brine carefully examined all available data concerning the property, visited the property, and was familiar with its physical condition and the surrounding terrain. Further, Texas Brine fully informed itself of all existing conditions and limitations, including all laws, ordinances and regulations. Finally, the Drilling Agreement confirmed that Texas Brine independently evaluated the information supplied by Legacy Vulcan pertaining to the work and did not rely upon any conclusions by Legacy Vulcan.

Soon thereafter, Legacy Vulcan received a report from Mr. Sevenker comparing the risks and benefits of drilling a 5,000-foot well and a 6,000-foot well. The report suggested that drilling a shallower well held certain benefits, including less subsurface risk, a greater salt pillar or web between the cavern and the dome edge, and all-around greater stability and reliability of the well. Mr. Sevenker explained the cost effectiveness of the total operation would be impacted if the proposed third well drilled out of salt, required early retirement, or was used as a backup well only.

Without disclosing its engagement of Mr. Sevenker, Legacy Vulcan conveyed some of his positions to Texas Brine, including the drilling comparison, which concluded that the shallower, 5,000-foot well was the beneficial alternative, as well as the concerns regarding the uncertainty of the edge of the dome. Texas

⁶ After reviewing the 1981 sonar, Mr. Sevenker reported the possibility that the OG1 was closer to the salt dome edge than previously indicated. There were also concerns over persistent gas accumulation within the OG1. Legacy Vulcan opined that if the sonar and the cavity dimensions plotted with the assumptions made in Mr. Toups’ report were correct, the OG1 would break through the overhang by 1983. The concern Legacy Vulcan had was if the OG1 were to fail, the OG2 could not alone shoulder the production necessary to supply its chloralkali business, and therefore, a third well had to be drilled to maintain business.

Brine responded to Legacy Vulcan's request to consider drilling a 5,000-foot well, countering that the deeper, 6,000-foot well would have a higher saturation at a better rate of flow; a smaller overall diameter; greater roof stability; and a longer expected life. Additionally, it was Texas Brine's belief that a smaller diameter cavern would be safer if there was a concern about the edge of the salt. Texas Brine persisted, and ultimately Legacy Vulcan agreed, to drill to the originally recommended depth of 6,000 feet.

Texas Brine successfully drilled the OG3 in July of 1982.⁷ Mr. Sevenker observed the drilling process on behalf of Legacy Vulcan and subsequently provided Legacy Vulcan with a drilling completion report. In his report, Mr. Sevenker reiterated the uncertainty of the salt dome edge due to the lack of data available. However, he believed that the dome edge was nearby, just at a lower depth than had been encountered with the OG1. Mr. Sevenker's conclusion was supported by the presence of gas bubbles and the difficulty in maintaining a minimum hole deviation during drilling. Mr. Sevenker also provided an estimated lifespan of the wells, using the production rate of 500,000 tons per year. Mr. Sevenker reported that realistically the wells had a 13-year supply of brine; however, Mr. Sevenker advised that the wells could achieve a 25-26 year life span, if the diameter of the wells increased.

Early in the operation of the OG3, gas production was noticed, which concerned Legacy Vulcan because of its prior experience with the OG1. When gas production persisted, Legacy Vulcan requested that Texas Brine investigate the possible causes for the unusual gas evolution from the brine well. Texas Brine proposed two possibilities for the origin of the gas. The first was that the well was actually quite close to the edge of the dome and a fracture could exist within the

⁷ We note that the permit application submitted to the Louisiana Department of Natural Resources by Texas Brine to drill the OG3 included the original 1959 New Orleans Institute map of the salt dome rather than the updated map showing a domal overhang that was created by Mr. Toups.

cavern allowing a stream of natural gas to enter the cavity from the edge. The second was that gas entrapment in the salt was being liberated during cavity development. After the study, Texas Brine advised Legacy Vulcan the results concluded that the gas was being released from within the salt.⁸

The OG3 turned out to be a reliable producer of brine, and the cavern developed steadily without incident or concern for the next fifteen years. Texas Brine monitored the pressure of the three wells and ran day-to-day operations on site. It designed and implemented any necessary diagnostic tests and work-overs of the wells. It also determined which wells to run and at what amount. Finally, Texas Brine ran sonar of the caverns.⁹ James Tichenor, manager of operations and later president of United Brine Services Company, LLC (UBS) a subsequently created, wholly-owned subsidiary of Texas Brine, explained the objectives of running sonar. While Legacy Vulcan was the lessee of the North 40, Texas Brine was responsible for maintaining the shape of the cavern and sonar was used to determine if the caverns were nearing the edge of the dome.

Meanwhile, in 1983, Oxy leased property adjacent to the North 40 to the Colorado Crude Company (Colorado Crude Lease) for the purpose of exploration and production of hydrocarbons. Due to the proximity of this property to the Salt Lease property, the Colorado Crude Lease specifically stated that the lessee was required to “diligently endeavor not to damage any salt formations which may exist upon the leased premises.” Texas Brine was aware of the lease, examined the

⁸ A year later, Legacy Vulcan once again expressed concerns to Texas Brine regarding the OG3 in that it appeared to be displaying similar characteristics to the OG1 and may be close to the edge of the dome as could be seen in sonar taken by Texas Brine. Texas Brine continued to emphasize that there was no correlation between the OG3’s gas production and the edge of the dome, and that the OG3 was developing well, unlike the OG1, and discouraged Legacy Vulcan from any further testing at this time as it would be costly and would not give a true picture of the cavern’s actual development.

⁹ In a 1986 cavity development and salt reserves assessment, Texas Brine presented the OG3’s sonar, which demonstrated it was developing normally, although with excessive gas production. Legacy Vulcan appeared to favor conservative growth of the OG3, with a suggested diameter of 180 feet or a more realistic 220 feet, although Texas Brine felt a 300 to 350-foot diameter was achievable.

proposed drilling site, and approved same. After acquiring Texas Brine's approval of the well site and the contract, the Adams Hooker 1 Well (AH-1) was drilled. It is undisputed that during drilling, the AH-1 did not drill into the salt dome or the OG3 cavern. Following the drilling of the AH-1, Texas Brine never received, nor ever requested, any pressure information regarding the AH-1. The AH-1 was operated without incident until it was idled in 2001. It was later plugged and abandoned in 2010.

Around 1997, Legacy Vulcan decided to expand its business and determined that it would require twice the amount of brine it currently received, or about 1,000,000 tons per year. Legacy Vulcan requested that Texas Brine present it with several options to meet its growing needs. Since an expansion of brine consumption on the North 40 would decrease the existing caverns' useful life expectancies, Texas Brine proposed that Legacy Vulcan consider drilling additional wells on a different property while continuing to operate on the North 40 (the White Castle option). This proposal was ultimately rejected by Legacy Vulcan. Texas Brine also recommended that Legacy Vulcan retain a second opinion regarding options on the North 40 from an outside consultant, suggesting Dr. Joseph Ratigan, a geologic engineer, who was quite knowledgeable in salt mine surveys.

On or around January 6, 1998, Legacy Vulcan contacted Dr. Ratigan, then at RE/SPEC Inc., to obtain his expert opinion regarding the viability of the North 40 to meet Legacy Vulcan's expanding needs. Legacy Vulcan stated that it needed to double its production of brine but had concerns about the viability of its current wells, especially the OG3. Legacy Vulcan explained that, although the OG3 was not experiencing any problems, there were concerns as it was located on the outer edge of the dome and continued to accumulate natural gas that required extensive bleed down before operation.

Armed with all of the data Texas Brine collected, including sonar surveys, the most recent map of the North 40, and gas intrusion reports, Dr. Ratigan, together with his colleague Thomas Eyermann, also with RE/SPEC Inc., began the evaluation. The first “progress” report dated February 19, 1998, was sent to Legacy Vulcan. Using certain assumptions, such as a maximum allowable diameter of 474 feet for the OG2 and OG3 and higher roof heights, Dr. Ratigan estimated that the salt reserves remaining in the three caverns were approximately 81,636,000 tons. There was potential for a smaller fourth well to be drilled on the property, with salt reserves estimated at about 8,000,000 tons.

As far as the proximity of the OG3 to the edge of the dome, RE/SPEC found that based on the map provided by Texas Brine, the OG3 was about 500 feet from the edge of the dome. *“However, and more critically, the bottom of the cavern [was] potentially very close to the ... projected overhang.”* (Emphasis in original). Moreover, Dr. Ratigan warned, “[a] literal interpretation of the map and sonar surveys in Well 3 would indicate that the cavern has already penetrated the salt!” In order to reduce the potential for decreasing the salt thickness between the cavern and the edge of the dome, Dr. Ratigan suggested two possible options: (1) changing the height of active mining in the cavern or (2) drilling a second well to the southeast of the present well. RE/SPEC ultimately concluded that the data available on the OG3 did not indicate that the cavern was directly or indirectly connected to the sediments outside the dome. Instead, the OG3 was developing very regularly, which was indicative of fairly pure salt. According to RE/SPEC, the changes in gas inflow did not suggest a connection to a gas source outside the dome.

In March 1998, a second, “draft,” RE/SPEC report was produced and provided nearly identical information as the first report, in greater detail, except with one notable change. Dr. Ratigan suggested that a geomechanical study be

done if Legacy Vulcan intended to fully use the projected reserves, which involved expanding the size of the caverns. The geomechanical study would indicate if a cavern of a given size would be stable or unlikely to collapse for a period of time. In this report, RE/SPEC concluded that the gas intrusion was a concerning indication that the cavern may be near the edge of the dome or may have intersected a non-salt unit. Mr. Eyermann testified that he recommended a geomechanical test, but did not require it as long as periodic surveys or sonar were completed on the bottom of the cavern. He also testified that he never saw any integrity issues with the OG3 at the time of drafting this report.

Legacy Vulcan forwarded this March 1998 draft to Texas Brine. As evidenced in an interoffice memorandum, Texas Brine disagreed with almost every point made in RE/SPEC's report. Regarding raising the roofs or increasing the diameter of the caverns, Jeff McCartney, a geologist employed by Texas Brine, wrote:

[R]educing the distance between the roof of the caverns and the top of salt while, at the same time increasing the diameters of the caverns (thus reducing the amount of salt pillar between the caverns) **INCREASES** the risk of possible subsidence due to the withdrawal of salt.

(Emphasis in original). Mr. McCartney further pointed to data collected and presented at the last two annual subsidence monitoring review meetings attended by Texas Brine, which showed there to be a greater than normal subsidence rate on the west flank of the dome, notably on the Legacy Vulcan and Oxy leases. As Mr. McCartney observed, it would make no sense to aggravate that possible situation. Mr. McCartney also noted that based on RE/SPEC's interpretation of the overhang, it was important that Texas Brine continue to monitor the development of the lower portion of the caverns. Texas Brine must also ensure that the diameters did not exceed the originally projected 300 feet, keeping in mind that the contour of salt overhang could be extremely unpredictable. Further, Mr. McCartney opined

that there was nothing wrong with continuing to mine the caverns as Texas Brine had been, which had thus far resulted in an extremely stable tear drop shape while maximizing the amount of salt recovered from the wells. This, coupled with periodic sonar surveys to monitor the development of the caverns, would enable Texas Brine to minimize the number of work-overs necessary to fully develop the wells. Mr. McCartney also commented that spending \$3 million to drill a fourth well with salt reserves of only 8 million tons did not make sense economically.

The estimate for the location of the salt overhang at the lowermost portion of the OG3 utilized in the March 1998 RE/SPEC report was based upon Texas Brine's conservative interpretation of drilling data, which placed the edge of the salt in the overhang relatively close to the edge of the salt (within 300 feet of the total depth drilled for the well). To the extent Legacy Vulcan was concerned with the proximity to the edge of the salt, Mr. McCartney suggested the mining could be adjusted to avoid any more mining towards the bottom of the cavern, without losing excessive salt reserves. Mr. McCartney's final conclusion was that he strongly opposed the idea of raising the cavern roof on the OG3, while at the same time increasing its diameter and decreasing the salt web thickness. Mr. McCartney further warned as follows:

If we get greedy on our salt extraction and cause a subsidence event we could possible [sic] trigger a larger event which could, in turn, cause a problem on adjoining leases (Enron or Oxy). With storage in the wells directly to our east we cause a disaster.

I must bring to mind what happened at the Akzo mine in New York when they got greedy with their salt recover = subsidence, loss of the mine, disastrous surface damage, tremendous legal actions, closer [sic] of operations and eventual sale of company. I, for one, do not want to be responsible for that happening at [Legacy] Vulcan.

Mr. McCartney testified that in 1998 he realized how close the OG3 was to the edge of the dome, but did not view it as a problem. The McCartney memorandum was never shared with Legacy Vulcan. Mr. Tichenor and Mr.

McCartney testified that, although they found the second RE/SPEC report to be quite flawed, they did not worry about it because operations on the North 40 could not be changed without Texas Brine's approval.

In a presentation given on April 2, 1998, RE/SPEC presented the findings of its March 1998 draft report to Legacy Vulcan and Texas Brine. Dr. Ratigan testified that he specifically told both Texas Brine and Legacy Vulcan that the OG3 was very close to the edge of the dome and would intersect, if it had not done so already.

After receiving input from Texas Brine and Legacy Vulcan, a third and "final" RE/SPEC report, dated April 17, 1998, was generated and delivered to Legacy Vulcan only. The major revision was to the estimated salt reserves as a result of incorporating Texas Brine's subsidence constraints on the size of the caverns (neither the heights nor the diameters of the caverns would be increased). The revised salt reserve amount was 23,000,000 tons. The report stated that, although the OG2 and OG3 were relatively near the projected edge of the salt dome overhang, mining in both caverns could be altered to increase the apparent salt web between the caverns and the edge of the dome. The report also recommended that both the OG2 and the OG3 should be surveyed periodically (after every 500,000 to 750,000 tons of salt mined) to ensure that the wells were not intercepting the edge of the dome. No conclusions were made by either Dr. Ratigan or Texas Brine that the OG3 needed to be shut down.

Legacy Vulcan also once again requested that Texas Brine make a determination regarding the source of the gas found within the OG3. Mr. Tichenor tasked Mr. McCartney, to reexamine the gas issue. The study concluded that the gas generation was from within the salt, although there had been a steady increase in accumulation. Texas Brine did not convey any concerns about the gas development or the integrity of the OG3 to Legacy Vulcan.

Following these reports, Legacy Vulcan and Texas Brine entered into a series of agreements, including the “First Amendment to the Salt Lease” (Amended Salt Lease), the “Amendment to Construction Contract and Facilities Lease” (Amended Facilities Lease), and the “Modification and Extension Agreement to the Operating Agreement” (Amended Operating Agreement). Notably, the Amended Operating Agreement provided for arbitration in case of dispute.

In 2001, Texas Brine organized UBS to house Texas Brine’s engineering and technical services group. UBS also provided well work, well drilling, capital projects, and some maintenance support, and was staffed by engineers, geologists, and geophysicists. The purpose for employing these individuals was two-fold: first, to allow Texas Brine in-house access to professionals with skills that assisted in the operation of the wells themselves; and second, to supervise the work of hired outside consultants and make recommendations based on the consultants’ work.

In 2003, Texas Brine made another proposal to Legacy Vulcan to drill additional wells on Texas Brine-owned property. This proposal did not disturb or alter the mining operations of the OG3, nor did it suggest that any concerns existed regarding the OG3’s structural integrity, safety, subsidence, or the possibility of a sinkhole. Texas Brine did not recommend that the OG3 be idled or placed in back-up mode as the reason for the need for additional wells. Rather, Texas Brine suggested that salt reserves may run out on the North 40 as the basis for drilling additional wells. Ultimately, Texas Brine withdrew its proposal within three months of its offer.

In 2004, Legacy Vulcan and Oxy began discussions about the sale and acquisition of Legacy Vulcan’s chloralkali business. In conjunction with these discussions, Oxy requested an estimate of the life of the wells and salt reserves left on the North 40; in turn, Legacy Vulcan requested the same information from

Texas Brine. Ted Grabowski, president of Texas Brine, responded in an email, stating that the OG2 had approximately 20 million tons of salt remaining, and the OG3 had approximately 15 million tons of salt remaining, which was well in excess of 15 years of reserves left, assuming no problems with any of the existing wells. Texas Brine pointed out that two wells were required to be in service at all times to meet the required flow rate and emphasized that the OG3 was of the greatest concern being near the dome edge and was at real risk of being lost prematurely due to washing out of the formation.

Mr. Grabowski explained at trial that the risk posed by the OG3's proximity to the edge of the dome was not a sinkhole. Instead, it was the potential for washout, similar to what occurred with the OG2, which would prevent further operation at that depth.

Legacy Vulcan forwarded Texas Brine's email to Oxy, which included the reserve numbers along with the well-life estimates. However, Legacy Vulcan did not include the portion of Texas Brine's email noting concerns regarding the proximity of the cavern to the salt dome edge.

Oxy was left to determine how 35 million tons of salt would only last 15 years of production. One Oxy employee weighed in, hypothesizing that these three wells may only have about 12 years of salt life left, especially since one of the wells was known to be near the dome edge and used as "back up only."

Oxy finally acquired Legacy Vulcan's chloralkali business in June 2005.¹⁰ Questions regarding salt reserves were constant for Oxy as concerns grew over its caverns' remaining useful lives. Initially after the acquisition, Texas Brine consistently proposed drilling new wells on existing, or soon-to-be, Texas Brine

¹⁰ In September 2004, Oxy created Basic Chemicals Company, LLC the entity that ultimately purchased Legacy Vulcan's chloralkali assets.

property.¹¹ This court notes that none of these proposals ever recommended that operation cease in the OG3.¹² On the other hand, Dr. Ratigan, now with PB Energy Storage Services, Inc. (PB Energy), suggested there may be plenty of salt left on the North 40; it was just a matter of whether Oxy could obtain it. Most importantly, Dr. Ratigan continued to propose a geomechanical test be done in order to better understand the makeup of the North 40. PB Energy had concerns related to the size of the wells on the North 40, as wells of this size were not typical, and subsidence rates tend to increase in areas where very large caverns are located.

The relationship between Oxy and Texas Brine deteriorated. Testimony at trial demonstrated that Texas Brine felt threatened by the presence of PB Energy, as it had already taken over operations of other Oxy facilities. Oxy also began looking at whether Texas Brine would be in breach of their contracts if the salt provided could not be mined from the North 40.¹³

¹¹ During this time, Oxy acquired a copy of the April 1998 RE/SPEC report and circulated it internally with the following email:

Interesting report. After reading it I know why [Texas Brine] bought the Enron property. It does say additional salt can be had from the North 40 but we need to understand better where the edge of the dome is and it is not in [Texas Brine's] best interest to help us with that...have we seen a drop off in brine quality over the past 10 years. If these caverns are moving toward the edge of the dome the report would lead one to that conclusion.

It also indicates that OG3 has more gas than other wells. I have never heard that Geismar has a gassing problem. Is that right?

We have to fully understand the subsidence issues and the total amount of salt we can get from the north 40. The report states 23,000,000 tons of recoverable salt. How much has been recovered since operations began?

¹² Mr. Grabowski testified that although he felt strongly about telling Oxy that the OG3's proximity to the salt dome edge may cause it to be lost prematurely, that concern was ultimately not included in any of the proposals to Oxy.

¹³ Wade Alleman, vice president of manufacturing, engineering and technology for Oxy, testified that he had prior experience with Texas Brine in the late 1990s and early 2000s while he was the operating manager of another Oxy facility. According to Mr. Alleman, PB Energy replaced Texas Brine as the third-party operator after pipeline leaks and issues arose under Texas Brine's operation of the assets.

Once it became clear to Texas Brine that any new wells that would be drilled would be on Oxy property, and perhaps with a new operator, Texas Brine stopped recommending drilling new wells and turned its focus on expanding the operation in the existing wells on the North 40. Gary Kinler, a capital manager at Oxy, testified that Texas Brine suggested that raising the roofs on the three existing caverns would be faster than drilling new wells and, obviously, more cost-effective.

In October 2007, Mr. McCartney suggested to Mr. Tichenor the following about the three wells located on the North 40:

Since we are going to be aggressive and raise the casing seat to 2000' on each of the wells and thus the minimum interface at 2100', I thought we could also be more aggressive on the maximum allowable radii. If we follow our standard solution mining spacing limitations of 100' from the lease line and 200' web spacing, there seems to be no reason we cannot mine these wells out to a greater radius. (see attached plot)

Limitation of Well 2 is the washout at 5100'...

Limitation of Well 3 is the proximity of the well to the edge of salt as per [RE/SPEC] report. Considering the worse [sic] case scenario and using a radius of 220' we can stay away from the projected salt flank by a reasonable safety margin. (see attached cross section)

Texas Brine ran its last sonar on the OG3 in 2007.¹⁴ Mr. McCartney, who was primarily responsible for evaluating and interpreting the OG3 sonar on behalf of Texas Brine and UBS, testified that he never saw any evidence of any anomaly that would indicate the OG3 was near the edge of the dome or lacked integrity. In fact, the 2005 and 2007 sonars demonstrated that the OG3 was developing as a text book well/cavern. According to Mr. McCartney, there was really no indication of any issue or concern until 2008 when the Legend Petroleum 3D Seismic data (Legend 3D data) was published and interpreted.

¹⁴ Mr. McCartney testified that although it was Texas Brine's policy to sonar every cavern every five years or every one million tons, whichever came first, no such sonar was performed by Texas Brine on the OG wells after 2007.

The Legend 3D data was collected in late 2007 and became available to all operators on the salt dome in early 2008.¹⁵ While the Legend 3D data was primarily obtained for oil and gas exploration and production purposes, it provided useful data on the dome edge. Dr. Ratigan evaluated the Legend 3D data on behalf of Oxy with the assistance of Kevin Hill of Hill Geophysical and Bill Goodman. This data was used to create the clearest “image” of the salt dome at this time. Significantly, Dr. Ratigan’s interpretation of the Legend 3D data revealed that the overhang had been over-estimated and that, in fact, it barely existed. However, there was some indication that the OG3 had penetrated dirty salt and sediments near its base, which was likely the source of the methane gas.

On June 4, 2008, Dr. Ratigan presented the Legend 3D data interpretation to Oxy. With regards to the OG3, Dr. Ratigan informed Oxy that it was “dangerously close” to the dome edge and recommended that the OG3 mining be terminated. Although there is some dispute concerning whether Mr. Tichenor attended this presentation, it is clear that Texas Brine participated in a meeting with Oxy on June 24, 2008. During this meeting, Texas Brine received Dr. Ratigan’s full power point presentation, which included his assessment and recommendation for the OG3. Texas Brine circulated this power point internally on June 25, 2008.

At Oxy’s request, Dr. Ratigan presented an abbreviated version of his Legend 3D data presentation to Texas Brine in December 2008, with the concluding recommendation that the OG3 be taken out of service.¹⁶ During the presentation, Mr. Tichenor expressed his disagreement with Mr. Hill and Dr.

¹⁵ As an operator, Texas Brine obtained a copy of the data for itself. Mr. McCartney testified that although Texas Brine had obtained a copy of the Legend 3D data, and tried to interpret it itself, it was of no benefit to Texas Brine because Texas Brine did not possess the expertise to make such an interpretation.

¹⁶ Bruce Martin, the president of UBS, testified that if the OG3 was to ever cease production, the order would have to be in writing, which Texas Brine did not receive until March 2009. Although he said Texas Brine would have accepted an oral order to shut down the OG3, it would need to be followed up in writing. Mr. Tichenor seconded this testimony, stating if idling the OG3 was what Oxy wanted to do, Mr. Tichenor would have also required that be in writing.

Ratigan's interpretation of the Legend 3D data. Mr. Tichenor testified that the interpretation of the Legend 3D data showed the edge of the salt dome intersected with the OG3 cavern. He disagreed with this finding due to the high quality of salt that was still being mined. He believed the data interpretation was flawed. Mr. McCartney likewise believed many of the conclusions in the presentation were erroneous. This spurred Texas Brine to question whether PB Energy was manipulating the data.

Following the presentation, Mr. McCartney reached out to Dr. Ratigan regarding the feasibility of mining above the casing. In response, Dr. Ratigan warned that this proposal was so risky that, if done, the parties needed to clearly understand who would be liable if something catastrophic happened.

Texas Brine continued with its skepticism of the Legend 3D data, recommending to Oxy that a vertical seismic profile (VSP) be run to determine the shape of the cavern. Texas Brine suggested that the roofs could be milled, i.e. the well casing could be cut off and raised if the caverns looked good,¹⁷ and Oxy could get the benefit of mining in its existing caverns, while minimizing any potential risks highlighted in the Legend 3D data.¹⁸

Not long after Oxy gave approval for a VSP, Texas Brine incorrectly informed Oxy that a VSP could not be run with the well's casing in place. Thus, the milling would have to be done prior to the VSP. Although there were risks associated with milling, such as losing mechanical integrity within the cavern, Texas Brine never advised Oxy of these risks. Texas Brine later admitted to Oxy that the milling was unnecessary, "ill-advised," and that Mr. Tichenor may have

¹⁷ Mr. Martin testified that if the roof was far from the dome edge, then Texas Brine should be able to mine higher with little additional cost and danger.

¹⁸ We note that Mark Cartwright, the vice president of business development for Texas Brine who was the president of UBS in 2010, testified that this would be the most extensive milling job Texas Brine had ever undertaken and there were concerns that it might not work.

oversold the project. This sudden procedural change only added to the discontent and suspicions between Oxy and Texas Brine.

In December 2008, Dr. Ratigan met with Texas Brine once again to discuss the edge of dome concerns. Following this meeting, Mr. McCartney drafted an email to summarize the parties' findings, which he forwarded to Dr. Ratigan for review. Dr. Ratigan agreed with the proposed email with one caveat:

No matter what (even if you raise the leaching strings), there exists the possibility that the lower cavity could "break through." How big is the risk? I do not know. However, *if mining is to continue in this well, someone needs to very consciously take on the risk and everyone needs to know who it is that is taking that risk.*

(Emphasis added). Dr. Ratigan testified that he said this to Texas Brine specifically because he knew that Texas Brine, as operator, would have to own this risk if they decided to continue mining.

In April 2010, Texas Brine submitted its UIC-17 form, or application to perform remedial work on a well, to Joseph Ball at the Louisiana Department of Natural Resources, Office of Conservation Injection and Mining Division (LDNR), with its plan to mill out the cement casing in the OG3. Although Mr. Ball was worried about a milling procedure, since he had seen so many go wrong, he knew Texas Brine was an experienced operator – operating many wells throughout Louisiana – and believed that Texas Brine knew what it was doing. Texas Brine had concerns of the OG3 "washing out" of salt but this concern was not raised with Mr. Ball. According to Mr. Ball, this would have meant the OG3 should no longer be mined. On May 4, 2010, Texas Brine's milling and mechanical integrity test (MIT) proposal/UIC were approved by the State.

Mr. McCartney testified that Texas Brine told LDNR and Oxy that prior to milling it would perform an ultrasonic inspection to analyze the thickness of the casing and a cement bond log to evaluate the bond between the casing and the cement behind the casing. However, unbeknownst to LDNR and Oxy, these tests

were not performed. Mark Cartwright, the vice president of business development for Texas Brine and former president of UBS, further testified that, although Texas Brine scheduled to run sonar before milling, it was not done. According to Mr. McCartney, no one with Texas Brine at this time knew the industry standard for a cavern's distance to the edge of salt.

Milling of the OG3 casing began in September 2010. The milling appeared to take longer than expected, during which the well needed to be connected to a tank to pick up the excess brine that was flowing out of the well. Towards the end of the milling the OG3 "kicked," requiring 400 barrels of brine to "kill the well." At trial, Dr. Neal Nagel, an expert in geomechanics, explained that there was a massive movement of fluid or gas out of the well, and Texas Brine had to counter this movement by "killing the well" or adding weighted fluid to weight up and provide a balance to the pressure underneath it. Operations continued, with Texas Brine installing a new flow line to the wellhead.

Around September 25 and 26, 2010, a VSP was performed on the well. On the evening of September 27, 2010, the OG3 experienced a reported thirteen-hour flow. Following this unexpected event, Texas Brine circulated several emails opining on the situation. Mr. Cartwright stated:

Sure seems to be connected to the surrounding rock. I'm told Well 1 drilled through the overhang.

There are two caverns I am familiar with that breached the edge of a dome, one at Petal and another at Bayou Choctaw. Both resulted in massive collapse and sinkhole development at the surface, as I recall. I think it's very important that we understand this cavern going forward. Hopefully, the VSP will provide some useful data. If this well is breached on bottom, as Well 1 is described to be, that's one thing, but if the cavern wall is breached and softer, less competent rock is exposed, we could see one hell of a mess one day, especially as we continue mining away salt overburden.

Mr. McCartney responded, in part, "[o]bviously it seems that we have a lot of gas coming from somewhere and since we have no evidence of any roof entrapments and we have not mined the well for several months the source of the gas is

suspect.” Mr. Cartwright responded in part, “[m]ore concerning than the gas, to me, is the loss of fluid. It seems disproportionate to the volume of gas produced.”

After the VSP was run, Texas Brine hired Halliburton Energy Services, Inc. (Halliburton) to pressurize the OG3 in preparation for the MIT. Over 20,000 tons of brine were injected into the OG3 *over* the anticipated maximum amount set by Texas Brine as the OG3 failed to hold pressure.¹⁹ As a result, an MIT was never performed. This failed “preMIT” confirmed Texas Brine’s suspicions after milling: there was a leak in the OG3.

Oxy allowed Texas Brine to hire Dr. Ratigan to help determine what went wrong. On October 26, 2010, Texas Brine forwarded its VSP results to Dr. Ratigan for a “second opinion.” Dr. Ratigan’s immediate opinion was that the milling was a complete waste of money.

In November 2010, Dr. Ratigan presented the following information to Mr. Cartwright of UBS/Texas Brine:

Recently, Texas Brine engaged PB Energy Storage Services (PB ESS) to assess the impact of a Texas Brine commissioned Vertical Seismic Profile (VSP) survey on PB ESS’s 2008 estimate of the edge of the Napoleonville salt dome near the [Oxy] Geismar brine production caverns...

In 2008, on behalf of [Oxy], PB ESS evaluated the edge of the dome based on a 3D seismic survey data set...The results of the assessment were reported to [Oxy] and [Oxy] requested the results be presented to Texas Brine. On December 17, 2008, I made the attached presentation to Texas Brine at their offices in Houston. The PB ESS position at this time was that continued mining of Well No. 3 was not advisable as the potential for loss of hydraulic integrity was very likely.

¹⁹ On September 30, 2010, Texas Brine contacted Halliburton and requested pumping service for miscellaneous pumping at 700 psi; i.e., the most pressure anticipated would be 700 psi. Christopher Borel, the Halliburton employee who pressured up the OG3, testified that he began work on site on October 2 and finished October 6, 2010. Having never been to the OG3 before, Mr. Borel relied on the information provided by Texas Brine while working at the site. Mr. Borel testified that he had not been warned that the well had kicked just a few days prior or any OG3 issues, all of which was important safety information.

In accordance with the pumping schedule, 36,000 barrels of brine were to be pumped into the OG3 well, but Mr. Borel was never instructed not to exceed 36,000 barrels by Texas Brine’s representative on site, Danny Ramirez. Mr. Borel reached 36,832 barrels at midnight on October 5; however, the OG3 had not pressured up to 700 psi. With no instructions to cease his operation, Mr. Borel pumped a total of 58,932 barrels at 800 psi.

Texas Brine apparently milled the lower portion of the production casing from Well No. 3 and engaged VSFusion (a Baker company) to execute a VSP survey to further address the location of the dome edge. The VSP survey data was transmitted to PB ESS's consultant, Hill Geophysical, who incorporated the data into the 3D seismic survey data set for the Oxy Geismar region of the dome. The Hill Geophysical report of the assessment is attached. As noted in the Hill report, the VSP data confirms the assessment made originally from the 3D data.

The VSP data has not altered the PB ESS position that this well should not be solution-mined.

Also in November 2010, Mr. Cartwright told Mr. Grabowski that it was conclusive the cavern had breached the salt dome. In a December 15, 2010 email, Mr. McCartney further confirmed that the presence of gas in one of his wells (OG3) was such that it potentially masked a cavern leak. Neither of these findings, nor concern over the cavern possibly being connected to the surrounding rock, were ever disclosed by Texas Brine to Oxy. Texas Brine did not inform Oxy of its suspicions of a leak in the cavern because there was no way to fix such a leak.

Texas Brine was required, as operator, to contact LDNR and advise of the OG3's compromised integrity. Oxy also wanted Dr. Ratigan to participate in meetings between Texas Brine and LDNR to ensure Oxy's interests were being protected. Dr. Ratigan was asked to assist in communicating with LDNR and developing a monitoring plan, comment on the monitoring plan, and comment on plugging and abandoning the OG3. Dr. Ratigan testified that Texas Brine took the lead in developing the initial monitoring plan, the lead in the January 2011 meeting with LDNR, and the lead in the plugging and abandoning plan that was ultimately implemented. Prior to sending its letter to Mr. Ball at LDNR, Texas Brine sent a draft to Dr. Ratigan in November 2010 for comments.

On January 21, 2011, Texas Brine wrote to Mr. Ball notifying him of the OG3's failed preMIT. Texas Brine reiterated that it was the current operator of the OG3 and explained that it wished to discuss options for placing the well in

monitoring status. Texas Brine raised the obvious concern of the cavern's proximity to the edge of salt and observed that a breach out of salt appeared possible. If the cavern was in hydraulic communication with the formations outside of the salt dome, such communication could have occurred during mining or during brine injection for the preMIT. Texas Brine further stated that although there were no obvious signs of the loss of integrity during the productive life of the cavern, these possibilities were under review and would be considered in the monitoring plan going forward. Texas Brine concluded that it sought guidance from LDNR in developing a plan for monitoring the OG3.

At trial, Mr. Ball testified that he suggested plugging and abandoning the OG3 after he learned of the leak in the well, if the leak could not be fixed via standard procedure. Mr. Cartwright also testified that Mr. Ball did not allow the full meeting to occur in January and quickly recommended the plugging and abandoning of the OG3.

Dr. Ratigan continued to emphasize the importance of monitoring the leaking well. He explained that usually caverns that have a tendency to pressure up are monitored, but in this case, the cavern was losing pressure. Nonetheless, he recommended that the OG3 be monitored.

Texas Brine, on the other hand, quickly shifted its position, believing that monitoring the well after the failed preMIT would not be beneficial. In preparing the well for monitoring, Texas Brine and UBS determined that the casing's integrity could not be established. With a leak in the casing, Texas Brine indicated that there was no way to detect the presence or location of other leaks in the cavern. Because it determined that monitoring the pressure of the well would have been useless, UBS began preparing the plugging and abandoning procedure.

Reviewing the recommendations of its experts, Oxy advised Texas Brine to proceed with plugging and abandoning. Wade Alleman,²⁰ Oxy's Geismar plant manager from June 2006-2011, testified that neither Dr. Ratigan nor Texas Brine advised Oxy that plugging and abandoning could be risky.

On February 28, 2011, Texas Brine sent notice to LDNR of its plugging and abandoning plan for the OG3. Mr. Ball testified that when the plugging and abandoning was approved, LDNR had no knowledge of a cavern leak, only a leak in the well casing that could not be fixed.

In March 2011, Dr. Ratigan corresponded once more with his colleague Mr. Eyermann regarding the OG3. Dr. Ratigan wanted Mr. Eyermann's thoughts regarding pressure within the well, suggesting the data (collected and kept by Texas Brine) revealed a possible leak in 2009-2010. Mr. Eyermann confirmed Dr. Ratigan's suspicion that the OG3 had been leaking since some time after August 2009 but before June 2010. Mr. Eyermann further opined, based on data, the leak would probably be below or at the seal level (within the cavern). Dr. Ratigan forwarded this email exchange and confirmation of a cavern leak to Oxy.²¹ During trial, Dr. Ratigan testified that, had Texas Brine looked at its own data, it would have been aware of the OG3's integrity issues.

It is clear that prior to plugging and abandoning Texas Brine was sufficiently aware of a cavern leak within the OG3 as evidenced by the testimony of Bruce Martin, the president of UBS, who stated Mr. Cartwright, then president of UBS,

²⁰ Mr. Alleman is currently Oxy's vice president of manufacturing, engineering and technology.

²¹ Afterwards, Dr. Ratigan wrote to Chuck Fontenot, of PB Energy:

It appears that the [OG3] was leaking before [Texas Brine] milled the casing (and spent a million dollars). If [Texas Brine] would have looked at the data they were collecting, they would have seen that and could have saved some money.

[Oxy] is well aware of this and said [Oxy] will probably not "go after [Texas Brine]."

informed him of this leak. Moreover, Texas Brine knew the cavern was collecting gas and brine was escaping prior to plugging and abandoning.

On June 16, 2011, John Sergio, then vice president of UBS, prepared a company email that included an update of UBS's entire works. Under the "Well Work" section, the update noted "[t]he plugging and abandoning of OG #3 is complete. May the well rest in peace and not create Lake McCartney." Mr. Sergio admitted that, based on the language used, it could be inferred that UBS contemplated the appearance of a sinkhole.

On July 26, 2012, about eight days prior to the emergence of the sinkhole, Texas Brine received word from LDNR that seismic tremors were being reported from the western side of the salt dome. Texas Brine circulated an internal email with "nervous laughs" and a warning that Texas Brine should brace itself for a very public event and begin to gather data.

On or about July 27, 2012, Texas Brine hired a public relations firm, and Oxy requested that Texas Brine contact LDNR about the OG3's recent plugging and abandoning in light of the reports of tremors and bubbling. Texas Brine continued to think of possible causes of the seismic tremors and bubbling and discussed placing blame on the oil and gas companies nearby, stating, "[t]hrow the dogs a bone and maybe they will look elsewhere besides our back yard." Mr. Cartwright explained this email was sent after Texas Brine learned of oil and gas exploration in close proximity to the OG3. He understood the email to mean that "the dogs" were the regulators inspecting potential causes of the tremors and bubbles.

On August 1, 2012, two days prior to the emergence of the sinkhole, Oxy, Texas Brine, and Dr. Ratigan met with LDNR to discuss the plugging and abandoning of the OG3 and the gas bubbles that had begun to emerge in the vicinity. When asked by Mr. Ball, whether there was a possibility of a sinkhole,

Dr. Ratigan responded that it was highly unlikely. The sinkhole emerged on August 3, 2012.²²

After all live testimony concluded on October 10, 2017, the district court invited all parties to submit post-trial briefs. All parties then rested. After receiving post-trial briefs, the district court issued its judgment on December 21, 2017, finding Oxy, Texas Brine, and Legacy Vulcan liable for the formation of the sinkhole. Fault was apportioned as follows: 50% to Oxy, 35% to Texas Brine, and 15% to Legacy Vulcan. Several parties then filed motions for a new trial. A contradictory hearing on the motions was held on March 20, 2018.

The district court took the matter under advisement and gave the parties additional time for briefing. The district court then granted the motions for new trial in part and denied in part, decreeing that the fault for causing the sinkhole was apportioned as follows: 40% to Oxy, 5% each to Oxy Petro and OXY USA, 25% to Texas Brine, 10% to UBS, and 15% to Legacy Vulcan. From this judgment, the parties appeal.

ASSIGNMENTS OF ERROR

Legacy Vulcan

- 1) The district court committed legal error by failing to apply Louisiana's proximate cause standard requiring a showing that Legacy Vulcan's actions immediately preceded and produced the effect complained of.
- 2) The district court committed legal error by failing to apply the intervening and superseding cause standard and determine whether intervening causes were reasonably foreseeable.
- 3) The district court committed legal error by imposing a duty on Legacy Vulcan under La. Civ. Code art. 2315 to police the activities of its expert independent contractor, Texas Brine.
- 4) The district court committed legal error by imposing a duty on Legacy Vulcan under La. Civ. Code art. 2317.1, which imposes no duties on former owners or custodians of a thing.

²² Following this recitation of facts at trial, Browning moved for an involuntary dismissal on October 9, 2017. Oxy Petro and OXY USA moved to join Browning's motion for involuntary dismissal. The district court granted Browning's motion, dismissing it from the case, and denied all other motions.

Oxy

- 1) The district court erred in imposing fault on Oxy because all claims between Texas Brine and Oxy must be referred to arbitration.
- 2) The district court erred by imposing fault on Oxy as mineral lessor under the Colorado Crude Lease.
- 3) The district court erred in assigning the largest share of fault to Oxy.

Oxy Petro

- 1) The district court erred by refusing to stay Texas Brine's claims against Oxy and Oxy Petro in favor of arbitration.
- 2) The district court erred by imposing liability on Oxy Petro as successor-in-interest to the agent of the mineral lessor of the Colorado Crude Lease.
- 3) The district court committed legal error by imposing fault on Oxy Petro where it did nothing to cause the sinkhole, and only approved its subsidiary's expenditures.

OXY USA

- 1) The district court erred by refusing to stay Texas Brine's claims against Oxy and OXY USA in favor of arbitration.
- 2) The district court committed legal error by imposing fault on OXY USA based on its status as an agent to the mineral lessor under the Colorado Crude Lease.

Texas Brine

- 1) This court should stay this appeal pending the conclusion of the trial on Texas Brine's fraud-based claims in **Crosstex**.²³
- 2) The district court manifestly erred in failing to assess the majority of fault against Oxy based on Oxy's superior capacity to prevent the sinkhole; Oxy's fraudulent or wrongful withholding of material information regarding the leaking OG3 cavern; Oxy's repeated rejection of alternative brine sources proposed by Texas Brine; and Oxy's decision to plug and abandon the OG3 in 2011.
- 3) The district court manifestly erred in assessing too little fault to Oxy Petro and OXY USA for their failure to monitor the AH-1 or take any steps to protect the salt wall in accordance with the Colorado Crude Lease.
- 4) The district court manifestly erred in failing to allocate any fault to Dr. Ratigan for withholding critical information from Texas Brine regarding the plugging and abandoning of the OG3.
- 5) The district court manifestly erred in failing to assess more fault against Legacy Vulcan based on its fraudulent withholding of information from

²³ For the reasons set forth in footnote 2, we find this "assignment" to be without merit.

Texas Brine; its control over a majority of the decisions regarding the OG3; and its superior knowledge to Texas Brine of continued operation.

- 6) The district court manifestly erred in dismissing with prejudice Texas Brine's claims against the oil and gas parties.²⁴
- 7) The district court erred in assessing too much fault to Texas Brine.

UBS's Answer

This court previously issued a rule to show cause order regarding the timeliness of UBS's answer to this appeal. The record indicates the appeal was lodged on September 6, 2018, the return date was September 18, 2018, and UBS's answer was filed on October 12, 2018. Thus, UBS's answer appears untimely under La. Code Civ. P. art. 2133(A), which requires that an answer to an appeal be filed "not later than fifteen days after the return day or the lodging of the record whichever is later."

UBS argues that its answer is timely as it was filed within fifteen days of the record being substantially supplemented, which supplement materially affected its ability to answer, relying on **Deutsch, Kerrigan & Stiles v. Rault**, 389 So.2d 1373 (La. App. 4th Cir. 1980), writ denied, 396 So.2d 883 (La. 1981). More recently, this court determined in **Breen v. Holmes**, 2016-1591 (La. App. 1st Cir. 12/7/17) 236 So.3d 632, writ denied, 2018-0049 (La. 3/2/18), 269 So.3d 708, that the completeness of a record did not affect the timing of the filing of an answer,

²⁴ This court notes that the dismissal of these parties has already been confirmed by previous appeals. See **Pontchartrain Natural Gas System, K/D/S Promix, L.L.C., and Acadian Pipeline System v. Texas Brine Company, LLC**, 2018-0001 (La. App. 1st Cir. 6/4/18), 253 So.3d 156, writ denied, 2018-1124 (La. 9/28/18), 253 So.3d 147; **Pontchartrain Natural Gas System, K/D/S Promix, L.L.C., and Acadian Pipeline System v. Texas Brine Company, LLC**, 2018-0606 (La. App. 1st Cir. 12/21/18), 268 So.3d 1058, writ denied, 2019-0526 (La. 6/17/19), 273 So.3d 1210; **Pontchartrain Natural Gas System, K/D/S Promix, L.L.C., and Acadian Pipeline System v. Texas Brine Company, LLC**, 2018-0360 (La. App. 1st Cir. 7/3/19), 280 So.3d 661; **Pontchartrain Natural Gas System, K/D/S Promix, L.L.C., and Acadian Pipeline System v. Texas Brine Company, LLC**, 2018-0631 (La. App. 1st Cir. 7/3/19), 281 So.3d 1, writ denied, 2019-01423 (La. 11/12/19), 282 So.3d 224; **Pontchartrain Natural Gas System, K/D/S Promix, L.L.C., and Acadian Pipeline System v. Texas Brine Company, LLC**, 2018-1159 (La. App. 1st Cir. 11/15/19), 290 So.3d 193; **Pontchartrain Natural Gas System, K/D/S Promix, L.L.C., and Acadian Pipeline System v. Texas Brine Company, LLC**, 2018-1170 (La. App. 1st Cir. 11/15/19), 293 So.3d 647. Therefore, this assignment is without merit.

distinguishing **Deutsch**. Therefore, the timeliness of an answer is strictly set out in Article 2133, which makes no exception for the filing of supplements. **Id.** at 635 n.2.

UBS presented no argument as to why or how it was prejudiced by the lack of the supplement, or how lack of the supplemented record materially affected its ability to answer. Further, UBS actually filed its answer prior to any supplementation of the record in this case, making its claim of prejudice unsupported. For these reasons, this court finds UBS's answer untimely and will not consider any arguments put forth therein. Therefore, the portion of the judgment allocating 10% fault to UBS is final.

LAW AND ANALYSIS

Arbitration

While the core issue in this appeal is whether the district court erred in its allocation of fault for the formation of the sinkhole, we initially address the threshold issue of arbitration between Texas Brine and the Oxy Entities, collectively: Oxy, Oxy Petro, and OXY USA. The Oxy Entities urge that the district court erred in refusing to stay the litigation and subsequently allocating any fault to them rather than compelling the Oxy Entities and Texas Brine to arbitration. Texas Brine, in turn, has put forth a series of arguments regarding why this court should omit any discussion, let alone issue a ruling, on arbitration.

We must begin by determining whether we have jurisdiction to review the denial to stay the litigation and compel arbitration by the district court in this appeal. Texas Brine asserts that this court lacks jurisdiction to rule on the issue of arbitration because it is not properly before us. According to Texas Brine, this appeal is a restricted appeal of a partial final judgment and does not encompass issues not addressed in the liability judgment. Citing **Carrollton Presbyterian Church v. Presbytery of South Louisiana of Presbyterian Church (USA)**,

2011-0205 (La. App. 1st Cir. 9/14/11), 77 So.3d 975, writ denied, 2011-2590 (La. 2/17/12), 82 So.3d 285, cert. denied, 568 U.S. 818, 133 S.Ct. 150, 184 L.Ed.2d 32 (2012).

Generally, when an unrestricted appeal is taken from a final judgment determinative of the merits, the appellant is entitled to seek review of all adverse and prejudicial interlocutory judgments, in addition to the review of the final judgment. **Carrollton Presbyterian Church**, 77 So.3d at 978-79. In the case of a restricted appeal, an appellant *may also* appeal an interlocutory judgment involving the same or related issues. *Id.* at 979 (Emphasis added). The district court's denial of a motion to compel arbitration is an interlocutory judgment. **Arkel Constructors, Inc. v. Duplantier & Meric, Architects, L.L.C.**, 2006-1950 (La. App. 1st Cir. 7/25/07), 965 So.2d 455, 458. The present appeal concerns the liability of the parties for the formation of the sinkhole, including the liability of the Oxy Entities and Texas Brine *vis-à-vis* each other. The "exceptions of arbitration" and requests for stay concerned whether the liability of these parties should be determined in accordance with a contractual arbitration provision. Because the district court's interlocutory rulings on the issue of arbitration are so interrelated with the district court's determination and enforceability of any judgment of liability for the sinkhole, it is appropriate to consider the merits of the Oxy Entities' assignments of error regarding arbitration in this case.²⁵ See Stevens v. St. Tammany Parish Government, 2016-0534 (La. App. 1st Cir. 1/18/17), 212 So.3d 568, 578.

²⁵ Even if we were to ignore past denials of these motions or exceptions, the parties raised the issue of arbitration again at trial, without achieving any resolution on the matter. In **Maldonado v. Kiewit Louisiana, Co.**, 2012-1868 (La. App. 1st Cir. 5/30/14), 152 So.3d 909, 923-24, writ denied, 2014-2246 (La. 1/16/15), 157 So.3d 1129, this court held that a party preserved the right to appeal rulings that had not been ruled on during trial when the party filed motions regarding the issue, fully briefed the issues thereby making known to the court the action it desired the court to take and the grounds for its objections, and repeatedly sought a ruling from the court regarding the issues.

The Oxy Entities assert that the district court should have stayed the proceedings and compelled arbitration between the Oxy Entities and Texas Brine to determine their liability for the formation of the sinkhole. Texas Brine opposes this argument. First, it asserts that the Oxy Entities waived their right to arbitration. Next, Texas Brine maintains that the Oxy Entities who are not signatories to the relevant contracts are not entitled to arbitration. Finally, Texas Brine argues that the arbitration agreement clearly does not encompass liability for tortious conduct.

This court already determined several of these issues in **Florida Gas Transmission Company, LLC v. Texas Brine Company, LLC**, 2018-0075 c/w **Pontchartrain Natural Gas System, k/d/s Promix, L.L.C. and Acadian Gas Pipeline System v. Texas Brine Company, LLC**, 2018-0241, c/w **Crosstex Energy Services, LP; Crosstex LIG, LLC; and Crosstex Processing Services, LLC v. Texas Brine Company, LLC**, 2018-0796 (La. App. 1st Cir. 7/1/19), 285 So.3d 1093, writs denied, 2019-01124 (La. 7/17/19), 277 So.3d 1180; 2019-014505 (La. 11/12/19), 282 So.3d 225. For the sake of brevity, we refer to and incorporate this court's prior findings and analysis from that opinion. Particularly, this court concluded that a valid arbitration agreement exists between Oxy and Texas Brine²⁶ and gives the arbitration panel the authority to determine which matters are arbitrable, including claims in tort, and to address procedural issues, such as waiver. This court also addressed and rejected Texas Brine's argument that the supreme court's order in **Crosstex Energy Services, LP v. Texas Brine Company, LLC**, 2018-1128 (La. 10/29/18), 255 So.3d 587 (per curiam)

²⁶ In **Florida Gas Transmission Company, L.L.C. v. Texas Brine, LLC**, 285 So.3d 1093, this court interpreted the arbitration agreement found in the Amended Operating Agreement, Section 12.10, as having a "delegation clause" whereby the parties to the agreement, Oxy and Texas Brine, contractually agreed to delegate the question of arbitrability of a claim to the arbitration panel.

determined the arbitrability of any claims discussed herein.²⁷ None of Texas Brine's arguments convince this court to reach a different conclusion on any of these issues, and we have found no reason to hold otherwise.

Next, we address whether Texas Brine's claims against Oxy Petro and OXY USA should be subject to arbitration even though these Oxy affiliates are not signatories to the arbitration agreement. OXY USA, and by incorporation, Oxy Petro, assert that they have standing to compel arbitration with Texas Brine regarding its claims against them for the alleged negligent operation of the AH-1. Citing **Grigson v. Creative Artists Agency, L.L.C.**, 210 F.3d 524, 527 (5th Cir. 2000), cert. denied, 531 U.S. 1013, 121 S.Ct. 570, 148 L.Ed.2d 488 (2000), OXY USA and Oxy Petro argue that Texas Brine is equitably estopped from avoiding arbitration because its claims against OXY USA and Oxy Petro are intertwined with and dependent on the arbitration agreement. OXY USA and Oxy Petro further argue that they may rely on equitable estoppel because Texas Brine raised allegations of substantially interdependent and concerted misconduct by all of the Oxy Entities with regard to the operation of the AH-1 well. **Id.** These Oxy parties assert that the claims raised by Texas Brine against them are virtually the same as the claims against Oxy. For instance, Texas Brine asserts that OXY USA and Oxy Petro were responsible for "the day-to-day monitoring of the [AH-1] well's drilling progress and operation" and for "monitoring the drilling and subsequent production from the [AH-1] well on behalf of Oxy as lessor." Texas Brine further contends that these parties are liable to it as "agents for Oxy." Therefore, Oxy Petro and OXY USA argue that Texas Brine's claims against them are based on the same conduct and breach of the same duties allegedly owed by Oxy.

²⁷ The supreme court's three-sentence order did not address the subject arbitration clause, nor did the follow up per curiam in **Florida Gas Transmission Co. v. Texas Brine Company, LLC**, 2019-0978, 2019-0979, 2019-0980 (La. 6/18/19) 275 So.3d 266 (per curiam), which clarified that its ruling was in the **Crosstex** litigation only.

In **Grigson**, the Fifth Circuit decided, as a matter of first impression, whether the principle of equitable estoppel could allow a non-signatory to a contract with an arbitration clause to compel arbitration with a signatory. 210 F.3d at 527-28. The **Grigson** court found two ways in which this type of equitable estoppel could be appropriate. The first occurs when a signatory to a written agreement containing an arbitration clause must rely on the terms of the written agreement in asserting its claims against the non-signatory (when each of a signatory's claims against a non-signatory makes reference to or presumes the existence of the written agreement, the signatory's claims arise out of and relate directly to the written agreement and arbitration is appropriate). The second occurs when the signatory to the contract containing the arbitration clause raises allegations of substantially interdependent and concerted misconduct by both the non-signatory and one or more of the signatories to the contract. *Id.* at 527. The "intertwined claims" doctrine comprises the foregoing independent bases for equitable estoppel. *Id.* See also **LeBlanc v. Texas Brine Co., LLC**, 2012-2059 (E.D. La. 5/10/16), 2016 WL 2849506 (unpublished).

After a thorough review of the record, we find that Texas Brine accuses Oxy, Oxy Petro, and OXY USA of tortious conduct or "misconduct" related to the operation of the AH-1. Although Texas Brine carefully pleaded its claims against these separate entities, we do not find that the various tortious acts are wholly separate and apart from each other. In light of the complex types of tortious claims alleged, it is nearly impossible to differentiate where one entity's fault would end and another would begin. Therefore, this court is persuaded that the allegations of misconduct against Oxy, Oxy Petro, and OXY USA are concerted and interdependent such that all of Texas Brine's claims against the Oxy Entities are subject to consideration by the arbitration panel.

Last, we find no merit in Texas Brine's argument that this court's previous denials of applications for supervisory writs of review of the district court's rulings on arbitrability are law of the case. Such rulings merely represent this court's decision not to exercise supervisory jurisdiction and, despite the inclusion of citations supporting the district court's decision, did not create law of the case. See Maloney Cinque, L.L.C. v. Pacific Insurance Company, Ltd., 2010-1164 (La. 5/21/10), 36 So.3d 236 (Once the court of appeal denied the writ, any additional remarks or findings are not binding.); Davis v. Jazz Casino Company, L.L.C., 2003-0276 (La. 6/6/03), 849 So.2d 497, 498 (per curiam).²⁸

Although the arbitration agreement between Texas Brine and Oxy must be rigorously enforced, Florida Gas, 285 So.3d at 1101, generally, courts will only stay arbitrable claims. Horseshoe Entertainment v. Lepinski, 40,753 (La. App. 2nd Cir. 3/8/06), 923 So.2d 929, 934, writ denied, 2006-0792 (La. 6/2/06), 929 So.2d 1259. Court proceedings will not be stayed simply because a party claims that an arbitration proceeding involving other parties concerns the same issues and conduct. Id. In some cases, it may be advisable to stay litigation among non-arbitrating parties pending the outcome of the arbitration. Id. However, this decision is one left to the discretion of the district court in controlling its docket. Id. While the claims between the Oxy Entities and Texas Brine are subject to a stay and arbitration, there is no colorable argument made by either of these parties that the entirety of this litigation, which includes claims by numerous parties who are not signatories to the arbitration agreement, should have been stayed.

Moreover, as Louisiana is a comparative fault state, the district court is mandated to allocate one hundred percent of fault to all persons it finds to have caused or contributed to plaintiffs' injury or loss, regardless of whether the person

²⁸ For these reasons, Texas Brine's exception of lack of appellate jurisdiction or, alternatively, motion to strike arbitrability from the Phase 1 liability appeal, Texas Brine's exception of res judicata, and Texas Brine's motion to strike Oxy's response to per curiam are all denied as moot.

is a party to the action, or a non-party. La. Civ. Code art. 2323; **Thompson v. Winn-Dixie Montgomery, Inc.**, 2015-0477 (La. 10/14/15), 181 So.3d 656, 663-664. Although at the time trial commenced, both Legacy Vulcan and Oxy had settled with plaintiffs and also with each other, rules of comparative fault mandate that the remaining defendant, Texas Brine, be allowed to prove both of these parties' fault.

Thus, because full allocation of fault at the end of a trial on liability is required by law, and the Oxy Entities could be found liable as “empty chair defendants,” we find no error in the district court’s decision to allocate fault to the Oxy Entities. We do, however, note that any enforceable judgment for contribution or indemnity purposes as between the Oxy Entities and Texas Brine must be decided in accordance with these parties’ arbitration agreement.²⁹

Liability

The Phase 1 trial on liability was held for the purpose of determining what caused the sinkhole to form and who, if anyone, was at fault under any theory of law. The district court concluded that the sinkhole was caused in various degrees by three elements: (1) the cavern’s proximity to the edge of the salt dome resulting in an unreasonably thin cavern wall and an eventual brine leak, (2) the substantial depressurization of the OG3 cavern caused by brine leaking from the cavern into the AH-1 reservoir, and (3) the timing of the plugging and abandoning of the OG3 well. In reviewing the district court’s reasons for judgment, it is clear that its determination of liability was essentially based on the parties’ negligence. Most negligence cases are resolved by employing the duty-risk analysis. Under this analysis, a plaintiff must prove: (1) the conduct in question was the cause in fact of the resulting harm; (2) the defendant owed a duty of care to plaintiff; (3) the requisite duty was breached by the defendant; (4) the risk of harm was within the

²⁹ For these same reasons, we deny the Oxy Entities’ motion for summary disposition.

scope of protection afforded by the duty breached; and (5) whether the plaintiff was damaged. **Hanks v. Entergy Corporation**, 2006-0477 (La. 12/18/06), 944 So.2d 564, 579. A negative answer to any of the elements of the duty-risk analysis prompts a no-liability determination. **Talbert v. Restoration Hardware, Inc.**, 2017-0986 (La. App. 1st Cir. 5/31/18), 251 So.3d 532, 536, writ denied, 2018-1102 (La. 10/15/18), 253 So.3d 1304.

Causation

Generally, the initial determination in the duty-risk analysis is cause in fact. **Boykin v. Louisiana Transit Company, Inc.**, 96-1932 (La. 3/4/98), 707 So.2d 1225, 1230. Cause in fact usually is a “but for” inquiry, which tests whether the accident would or would not have happened but for the defendant’s substandard conduct. **Id.** Where there are concurrent causes of an accident, the proper inquiry is whether the conduct in question was a substantial factor in bringing about the accident. **Perkins v. Entergy Corporation**, 2000-1372 (La. 3/23/01), 782 So.2d 606, 611. To satisfy the substantial factor test, the plaintiff must prove by a preponderance of the evidence that the defendant’s conduct was a substantial factor in bringing about the harm. See **Dabog v. Deris**, 625 So.2d 492, 493-94 (La. 1993).

Proof is sufficient to constitute a preponderance when the entirety of the evidence, both direct and circumstantial, shows the fact sought to be proved is more probable than not. **Hanks**, 944 So.2d at 578. Thus, the plaintiff in this type of action must produce evidence from which the factfinder can reasonably conclude his injuries, more probably than not, were caused by the negligence of the particular defendant. **Id.** The plaintiff, however, does not have to conclusively exclude all other possible explanations for his injuries, because the standard is not proof beyond a reasonable doubt. **Id.** Placing the burden of proof on the plaintiff requires him ultimately to persuade the factfinder concerning the defendant’s

negligence, and if the factfinder is undecided after all the evidence has been presented, the plaintiff loses because of the failure of his evidence. **Id.**

As mentioned, the proof may be by direct or circumstantial evidence. **Id.** A fact established by direct evidence is one that has been testified to by witnesses as having come under the cognizance of their senses. **Id.** Circumstantial evidence, on the other hand, is evidence of one fact, or set of facts, from which the existence of the fact to be determined may be reasonably inferred. **Id.** Use of circumstantial evidence and the deductions and inferences arising therefrom is a common process for establishing liability in negligence cases. **Id.** at 579. However, the inferences drawn from the circumstantial evidence must cover all the necessary elements of negligence, and the plaintiff must still sustain the burden of proving his injuries were more likely than not the result of the defendant's negligence. **Id.** If, as in this case, circumstantial evidence is relied upon, that evidence, taken as a whole, must exclude every other reasonable hypothesis with a fair amount of certainty. This does not mean, however, that it must negate all other possible causes. **Id.** See also Benjamin ex rel v. Housing Authority of New Orleans, 2004-1058 (La. 12/1/04), 893 So.2d 1, 4-5.

Whether the defendant's conduct was a substantial factor in bringing about the harm and, thus, a cause in fact of the injuries, is a factual question to be determined by the factfinder. **Perkins**, 782 So.2d at 612. A court of appeal may not set aside a trial court's finding of fact in the absence of manifest error or unless it is clearly wrong. **Id.** The supreme court has established a two-part test for the reversal of a district court's determination of fact: (1) the appellate court must find from the record that a reasonable factual basis does not exist for the finding of the trial court, and (2) the appellate court must further determine that the record establishes that the finding is clearly wrong (manifestly erroneous). **Stobart v. State through Department of Transportation and Development**, 617 So.2d

880, 882 (La. 1993). Further, on review, an appellate court must be cautious not to re-weigh the evidence or to substitute its own factual findings just because it would have decided the case differently. **Ambrose v. New Orleans Police Department Ambulance Service**, 93-3099 (La. 7/5/94), 639 So.2d 216, 221.

However, while deference must be given to the factfinder's determinations, this does not mean that the trial court's factual determinations cannot ever, or hardly ever, be upset. **Id.** The court of appeal, in fact, has a constitutional duty to review facts. **Id.** To perform its constitutional duty properly, an appellate court must determine whether the trial court's conclusions were clearly wrong based on the evidence or clearly without evidentiary support. **Id.**

The AH-1 Reservoir

The second causative factor identified by the district court concerned the purported leakage of brine from the OG3 cavern into the AH-1 reservoir. The Oxy Entities contend the district court erred in finding them liable for causing the sinkhole due to their involvement with the depleted AH-1 reservoir.

In its reasons for judgment, the district court found the Oxy Entities liable under La. Civ. Code arts. 2315 and 2317.1 "for their failure to responsibly monitor the AH-1 well and depletion from the AH-1 reservoir." The court found that this depleted reservoir created an unreasonable risk of harm into which the OG3 leaked its brine, leading to the sinkhole.

As the sole remaining defendant in the main demand, invoking fault on "non-parties," Texas Brine had the burden of proving that the Oxy Entities' conduct with regards to the AH-1 reservoir was a cause-in-fact of the OG3 cavern collapse and resulting sinkhole. See Landry v. Doe, 2019-0880 (La. App. 1st Cir. 6/21/20), -- So.3d --, 2020 WL 3481703, *12, writs denied, 2020-00952 (La. 10/20/20), 303 So.3d 313; 2020-00948 (La. 10/20/20), 303 So.3d 316, citing Willis v. Noble Drilling (US), Inc., 2011-598 (La. App. 5th Cir. 11/13/12), 105 So.3d

828, 842. To this end, Texas Brine presented the testimony of Dr. Nagel, who promulgated the theory that the Oxy Entities were at fault for the sinkhole because of the existence of the depleted AH-1 reservoir on the Oxy Entities' property adjacent to the OG3.³⁰

Dr. Nagel's causation theory was that the sinkhole resulted from a combination of severe pressure loss in the OG3 cavern, the close proximity of the OG3 cavern to the edge of the salt dome, and the untimely plugging and abandoning of the OG3. Dr. Nagel testified that the only way he could account for such an incredible loss of pressure within the OG3, to the extent that the collapse occurred, was if the brine within the OG3 moved to another space, namely the AH-1 reservoir. Therefore, but for the presence of the AH-1 reservoir, the OG3 cavern would not have suffered a significant pressure loss such that it would collapse and form a sinkhole.

Dr. Nagel declined to opine as to whether the AH-1 reservoir caused the OG3 cavern leak. In fact, he testified that his models, both physical and computer-generated, did not show any stress changes in the salt dome that were caused by the depletion of the AH-1 reservoir or that the AH-1 reservoir made the OG3 cavern more likely to fail. He clearly testified that the models did not show a pathway from the OG3 cavern to the AH-1 reservoir and could not explain how the brine in the OG3 would have made its way into the AH-1 reservoir. Moreover, Dr. Nagel's models did not show a failure of the OG3, which would result in a sinkhole, until the data upon which the model was based was manipulated to such an extent that (1) the location of the OG3 was moved approximately half the

³⁰ We acknowledge Texas Brine's attempt to link oil that was allegedly found in the sinkhole to the AH-1 reservoir weeks after the formation of the sinkhole. However, not one single expert provided testimony that could determine the source of the oil, as many were unqualified to do so. None of the experts could demonstrate the oil came from AH-1 rather than from another of the 180 oil-producing wells within a 45 square mile area around the OG3 or one of three shallow producers within two miles of the OG3, and none could determine when the oil first became present in the sinkhole.

distance closer to both the edge of the dome and the AH-1 reservoir, (2) the location of the AH-1 reservoir was moved to completely abut and wrap around the salt dome, (3) the AH-1 reservoir was presumed completely depleted, and (4) a hypothetical “worst case scenario” of pressure loss was assumed within the OG3. Dr. Nagel freely admitted that the “data” for this scenario was all manipulated because using the actual placement of the OG3 with respect to the salt dome edge and the AH-1 reservoir, as well as the pressure readings of the AH-1 and its general placement *vis-a-vis* the salt dome, resulted in no leak, let alone complete integrity failure of the OG3. Thus, only in this admittedly fictional scenario could Dr. Nagel demonstrate his theory – that the cause of the collapse of the OG3 was its severe pressure drop due to leakage into the AH-1 reservoir. Despite the results of his models proving the contrary, Dr. Nagel concluded that the brine moved from the OG3 cavern to the AH-1 reservoir because there was simply no other explanation for the OG3’s failure.

None of the other testifying experts attempted to explain how the existence of the AH-1 reservoir could affect the OG3, nor could they demonstrate any communication between the OG3 and the AH-1 reservoir. They did not testify that the AH-1’s existence or operation violated any state or local standards or regulations, as there is no requirement for pressure maintenance in a depletion well. In fact, Dr. Robert Thoms, an engineer and expert in the behavior of salt, Mr. Mike Veazey, a petroleum engineer, and Dr. Ahmad Ghassemi, an expert in geomechanics, testified that the AH-1 reservoir existed in complete hydraulic isolation until at least 2010. Further, Mr. Louis Gilbert, a petroleum geologist, testified that the AH-1 did not drill into salt when it was established, and its operation did not push into the salt, or cause any stress on the salt or the OG3 cavern. Instead, Mr. Gilbert and Dr. Thoms testified that it was the OG3 that grew towards the salt dome edge, and by default the AH-1 reservoir, creating the

unreasonable condition of a thin salt web between the OG3 and the salt dome edge, which made collapse and failure of the cavern more likely. The experts further agreed that depressurization of oil and gas reservoirs near a salt dome is not uncommon due to the perfect environment created by salt domes in trapping hydrocarbons.

Dr. Nagel testified that the only explanation he could give for a massive pressure depletion in the OG3, necessary for his theory regarding the causation of the sinkhole, was that brine leaked from within the OG3 into the AH-1 reservoir. He admitted that he did not explore any other theories of depressurization. While a severe pressure loss within the OG3 may be explained by a leak into the AH-1 reservoir, it is clear from the evidence that it was the OG3 that posed an unreasonable risk of harm rather than the AH-1. The expert testimony demonstrated that the OG3 grew closer to the salt dome edge, and consequently the AH-1, rather than the other way around. Moreover, the pressure within the AH-1 remained static once it was idled in 2001 through the time of its plugging and abandoning in 2010. Conversely, the OG3 experienced accelerated mining and over-pressurization. Additionally, the testimony presented was that there was no evidence of communication between the two bodies, i.e., that the AH-1 did not drill into the salt or cause any stress on the salt dome or the OG3 during the entirety of its operation through its plugging and abandoning in 2010, as it remained in hydraulic isolation. Although the record supports the finding that there was a leak in the OG3, a thorough review of the record reveals no reasonable factual basis for the district court's finding that the AH-1 reservoir was a cause in the OG3 cavern collapse. Further, the expert testimony taken as a whole establishes that this finding is clearly wrong. Therefore, we find that the district

court manifestly erred in finding the operation of the AH-1 or the existence of the depleted AH-1 reservoir to be a causative factor in the formation of the sinkhole.³¹

Because the presence of the AH-1 reservoir was not a cause-in-fact of the collapse of the OG3 cavern, we find that Oxy Petro and Oxy USA cannot be liable for the formation of the sinkhole as the district court only found Oxy Petro and Oxy USA liable due to their involvement with the AH-1.

Placement/Expansion and the Plugging and Abandoning of the OG3

The remaining factors the district court determined to be the cause of the sinkhole for which it allocated fault were the placement and/or expansion of the OG3 near the salt dome edge and the untimely plugging and abandoning of the OG3. As previously mentioned, when there are multiple causes of an injury, cause in fact as to a specific defendant clearly exists when the plaintiff's harm would not have occurred absent the specific defendant's conduct. **Perkins**, 782 So.2d at 606. If there is more than one cause of the loss, the initial tortfeasor will not be relieved of the consequences of his negligent actions unless an intervening cause superseded the original negligence and alone produced the accident. Even if there is an intervening cause, the original tortfeasor will not be relieved of liability if he could or should have reasonably foreseen that the accident would have happened as a result of his negligence. **Adams v. Rhodia, Inc.**, 2007-2110 (La. 5/21/08), 983 So.2d 798, 808.

The district court found Legacy Vulcan liable, in part, for its role in placing and expanding the OG3. Legacy Vulcan asserts that it cannot be held liable because when it sold its business in 2005, the cavern had mechanical integrity. Legacy Vulcan further argues that Oxy and Texas Brine's actions after 2005 solely

³¹ This finding is consistent with our opinion in **Pontchartrain Natural Gas System**, 281 So.3d at 8, and conclusion that none of the experts who testified during the Phase 1 liability trial established a definitive path through which the brine could flow from the OG3 cavern through the salt wall into the sealed AH-1 reservoir. "Thus, Texas Brine's depressurization theory was mere speculation and not substantiated." **Id.**

caused the sinkhole, specifically pointing to the untimely plugging and abandoning as an intervening and superseding cause.

Supporting Legacy Vulcan's argument, the record reveals that the two causation experts who testified, Drs. Nagel and Evan Passaris, an expert in mining engineering, rock mechanics and geomechanics, both found the untimely plugging and abandoning to be the proverbial nail in the coffin in causing the sinkhole. Moreover, Dr. Thoms testified that the OG3 was a "text book cavern" through 2005, and Dr. Nagel further testified that the cavern was stable until at least 2007.

However, both Drs. Nagel and Passaris listed the thinness of the salt web between the OG3 and salt dome edge as being a factor in causing the collapse of the OG3. Moreover, Dr. Passaris testified that the thinness of the salt web was the primary cause of the cavern collapse and subsequent sinkhole. Dr. Passaris stated that the majority of the cavern growth occurred prior to 2005, as the cavern only grew about fourteen feet between 2005 and 2010. Dr. Thoms also acknowledged that the OG3 cavern breach was caused by the close proximity of the salt dome edge and the thin wall of the cavern, which was directly related to the solution mining of the OG3 cavern. Mr. Christopher Thompson, a geophysicist, testified that the salt web between the OG3 and the salt dome edge was quite thin, only 40-50 feet. Dr. Nagel also testified that a leak was more likely to occur in the OG3 given the cavern was so close to the edge of the dome. The main point of the testimony regarding the salt web was that the thinner the wall, the more likely it would be to leak and fail, and the wall of the OG3 was quite thin.

The evidence reflects that other factors contributed to the causation of the sinkhole, such as the leak in the OG3, which may have been exacerbated by the preMIT operations in 2010 and the untimely plugging and abandoning. However, as the expert testimony suggests, the latter two events would not have caused the sinkhole without the closeness to the edge/thinness of the salt web between the

OG3 and the salt dome edge. The thinning wall, combined with a leak in the cavern system that allowed the OG3 to lose pressure, without proper supervision due to the plugging and abandoning, created the perfect storm of events, which caused the collapse of the massive cavern and the emergence of the sinkhole. Thus, the proximity to the edge and thinness of the wall attributable to the period when Legacy Vulcan was lessee created a force or series of forces that was in continuous and active operation up to the time of the OG3's collapse. See LeJeune, 365 So.2d at 475.

Therefore, the district court was not manifestly erroneous in finding the cavern's pre-2005 growth, resulting in the thinness of the salt web between the OG3 cavern and salt dome edge, was a contributing cause to the collapse of the OG3 cavern.

We also find no manifest error in the district court's finding that the untimely plugging and abandoning of the OG3 was a cause of the sinkhole. The uncontradicted testimony of the two causation experts, Drs. Nagel and Passaris both cited the plugging and abandoning of the OG3 as a cause of the collapse of the cavern, because it took away any mode of monitoring pressure within the cavern or rectifying any issues therewith, such as extreme pressure loss.

Duty

The determination of the responsibility for the two remaining causative factors (the placement/expansion of the OG3 near the salt dome edge and the untimely plugging and abandoning) that together led to the sinkhole involves an analysis and comparison of the respective duties and the responsive conduct of Legacy Vulcan, Texas Brine, and Oxy. Whether a duty is owed is a question of law. **Lemann v. Essen Lane Daiquiris, Inc.**, 2005-1095 (La. 3/10/06), 923 So.2d 627, 633. The inquiry is whether the plaintiff has any law – statutory, jurisprudential, or arising from general principles of fault – to support his claim.

Maw Enterprises, L.L.C. v. City of Marksville, 2014-0090 (La. 9/3/14), 149 So.3d 210, 217. The particular facts and circumstances of each individual case determine the extent of the duty and the resulting degree of care necessary to fulfill the duty. **Socorro v. City of New Orleans**, 579 So.2d 931, 938 (La. 1991). Because of the interdependent and slightly convoluted relationships between Legacy Vulcan, Texas Brine, and Oxy, it is key in this litigation to determine which party owed what duty and to whom.

In the case before us, Oxy's predecessor, Hooker Chemicals, owned a parcel of land, the North 40, which it leased to Texas Brine for the purpose of exploration and production of minerals, namely brine. This Salt Lease included within it a clause wherein Texas Brine agreed to operate on the leased premises in a prudent manner. Texas Brine further agreed to conduct its brine mining operations in compliance with the regulations of all governmental agencies. The Salt Lease further obligated Texas Brine to run sonar tests periodically to confirm the salt extraction was from the Salt Lease premises rather than any adjoining properties.

Texas Brine in turn "assigned" the Salt Lease to Legacy Vulcan, wherein Legacy Vulcan agreed to assume all obligations of the lessee in and under the Salt Lease. Therefore, the duty to act as a prudent lessee was passed from Texas Brine to Legacy Vulcan. However, due to subsequent agreements, Texas Brine took back most of this duty by contracting to remain the operator of the brine mining operation on behalf of Legacy Vulcan, while leasing to Legacy Vulcan certain facilities associated with brine mining. This Operating Agreement further obligated Texas Brine to maintain and repair and at all times keep in good and safe operating condition the facilities leased by it to Legacy Vulcan, together with all replacements, modifications or expansions thereof.

After the expiration of the initial term, Legacy Vulcan and Texas Brine continued this agreement by executing the Amended Operating Agreement in

2000. Once again, Texas Brine obligated itself to be the operator on behalf of Legacy Vulcan. Texas Brine also contracted to:

(a) keep the Facilities and other Leased Premises in as reasonably safe condition as its operations permit, (b) keep the Facilities and the other improvements and Leased Premises located on the Salt Lease Premises, whether leased to [Legacy] Vulcan or owned by it, and all other property leased to [Legacy] Vulcan under the [Salt] Lease (including the pipeline and Pipeline Expansion), in good repair and operating condition (reasonable wear and tear excepted), making from time to time all necessary and proper repairs thereto (including, without limitation, exterior and structural repairs, renewals and replacements), and (c) comply with, perform, and fulfill all obligations of [Legacy] Vulcan to Texas [Brine] under the [Salt Lease] with respect to the maintenance, operation, and preservation of the Leased Premises.

A new section was added, which provided, in part, as follows:

In the performance of its obligations under the [Amended Operating] Agreement, Texas [Brine] shall comply in all material respects with all laws, rules, orders, ordinances, directions, regulations and requirements of federal, state, county and municipal authorities pertaining to its operation of the Facilities and the other Leased Premises, and with the recorded covenants, conditions and restrictions, regardless of when they become effective, including, without limitation, all zoning and other land use matters, and utility availability, and with any direction of any public officer or officers, pursuant to law, which shall impose any duty upon Texas [Brine] or [Legacy] Vulcan with respect to the use or occupation of the Leased Premises, and all applicable Environmental Laws.

Generally, liability for the negligent and tortious acts of another does not flow simply because of a principal-agent or principal-mandatarly relationship. **Rowell v. Carter Mobile Homes, Inc.**, 500 So.2d 748, 751 (La. 1987). Only when the relationship of the parties includes the principal's right to control physical details of the actor as to the manner of his performance, which is characteristic of the relation of master and servant, does the person in whose service the act is done become subject to liability for the physical tortious conduct of the actor. **Id.**

The same basic rule applies to independent contractors generally; a principal is not liable for the offenses committed by an independent contractor while

performing its contractual duties. **Thompson**, 181 So.3d at 665. However, there are two exceptions to the general rule of non-liability: (1) where the work performed by the contractor is ultrahazardous; or (2) if the principal reserves the right to supervise or control the work of the independent contractor. **Id.**

Under the first exception, a principal may not avoid liability for injuries resulting from an ultrahazardous activity by hiring out the work to an independent contractor. **Triplette v. Exxon Corp.**, 554 So.2d 1361, 1362 (La. App. 1st Cir. 1989). Whether an activity qualifies as ultrahazardous in Louisiana is a question of law. **Id.** Three factors have evolved in order to determine whether an activity is ultrahazardous: (1) the activity must relate to land or some other immovable; (2) the activity itself must cause the injury, and the defendant must be engaged directly in the injury-producing activity; and (3) the activity must not require substandard conduct to cause injury. **Id.** We need not consider the first two elements of this definition because brine mining does not satisfy the third. This element requires that the activity “can cause injury to others, even when conducted with the greatest prudence and care.” **Id.**, quoting **Kent v. Gulf States Utilities Co.**, 418 So.2d 493, 498 (La. 1982). The “ultrahazardous” label is thus limited to those activities that present “a risk of harm that cannot be eliminated through the exercise of due care.” **Triplette** at 1363, quoting **O’Neal v. International Paper Co.**, 715 F.2d 199, 202 (5th Cir. 1983). We conclude that this is simply not the case for brine mining, as there are scores of brine mining operations throughout the state that have not resulted in cavern failure and collapse, and have found no Louisiana case holding otherwise.

The second exception imposes liability upon a principal for the negligent acts of an independent contractor when the principal reserves the right to supervise or control the work. It is not the supervision and control that is actually exercised that is significant, but it is the right to exercise it that is of primary concern in

determining whether a principal may be held liable for the torts of an independent contractor. **Triplette**, 554 So.2d at 1363. The “control” determination depends in great measure upon whether and to what degree the right to control the work has been contractually reserved by the principal. The supervision and control that is actually exercised by the principal is less significant. **Id.** To be clear, a principal is entitled to maintain supervisory control over a project done by an independent contractor in order to insure compliance with the contract terms; it is when the principal exercises operational control of the work that the status of independent contractor might be in doubt. **Id.** See also **Sandbom v. BASF Wyandotte Corp.**, 95-0335 (La. App. 1st Cir. 4/30/96), 674 So.2d 349, 354. Mere inspection of the work done by an independent contractor and direction as to the final results of the project are insufficient to support a conclusion that the principal has retained enough control over the project to defeat the principal/independent contractor immunity. **Id.**

A review of the original and the amended operating agreements reflects that Texas Brine reserved unto itself the right to exercise daily operational control over mining. The agreements reserved to Legacy Vulcan, and later Oxy, the ability to determine the quantity and quality of brine needed for its operation. It was then up to Texas Brine to deliver that amount. Mr. McCartney’s testimony supports this finding. He explained that the lessee told Texas Brine how much brine was needed. Texas Brine was then required to operate the wells to meet the quota.

We next turn to the Louisiana Mineral Code in order to better determine what, if any, duties were owed by the parties with respect to the roles each party accepted via their agreements.

The Louisiana Mineral Code, set forth in La. R.S. 31:1 et seq., was enacted in 1974.

The provisions of this Code are supplementary to those of the Louisiana Civil Code and are applicable specifically to the subject matter of mineral law. In the event of conflict between the provisions of this Code and those of the Civil Code or other laws the provisions of this Code shall prevail. If this Code does not expressly or impliedly provide for a particular situation, the Civil Code or other laws are applicable.

La. R.S. 31:2. Moreover, the provisions of the Mineral Code are applicable to all forms of minerals, and the right to explore for or mine or remove from land the soil itself or other substances occurring naturally in or as a part of the soil or geological formations on or underlying the land. La. R.S. 31:4.

The duty to develop and operate as a prudent operator is established in Mineral Code article La. R.S. 31:122 which provides, in part, as follows:

A mineral lessee is not under a fiduciary obligation to his lessor, but he is bound to perform the contract in good faith and to develop and operate the property leased as a reasonably prudent operator for the mutual benefit of himself and his lessor.

The Louisiana Supreme Court decided in **Terrebonne Parish School Board v. Castex Energy, Inc.**, 2004-0968 (La. 1/19/05), 893 So.2d 789, 805 and reiterated in **Broussard v. Hilcorp Energy Company**, 2009-0449 (La. 10/20/09) 24 So.3d 813, 819-20, that article 122 simply adapts the general “good administrator” standard of Louisiana Civil Code art. 2710, applicable to all leases, to the specific context of a mineral lease.

The **Broussard** court further explained that “develop and operate” as related to a lessee’s actions as a prudent operator are terms of art within the oil and gas industry. “Develop,” as used in the industry, “contemplates any step taken in the search for, capture, production and marketing of hydrocarbons.” “Operate” can be defined as any activity leading to the production of oil and gas. **Broussard**, 24 So.3d at 820, citing Patrick H. Martin & Bruce M. Kramer, Williams & Myers: Manual of Oil and Gas Terms, p. 272 (10th Ed., 1997).

We acknowledge that our supreme court in **Broussard and Terrebonne Parish** defined the terms “develop” and “operate” in the context of oil and gas operation. However, as stated in La. R.S. 31:4, the provisions of the mineral code are applicable to all minerals. The terms “develop” and “operate” defined by the court refer to obligations of operating under a mineral lease, and found in the Mineral Code. Thus, because the same code article governs the duties to operate under any mineral lease, be it brine or hydrocarbons, we find that the interpretation of those duties, should likewise be the same, whether it be for operators of brine or hydrocarbon mines.³²

The following regulations, found within the Administrative Code, are applicable to the Salt Lease at issue in this case. When a facility is owned by one person and operated by another, it is the operator’s duty to obtain a permit. La. Admin. Code tit. 43, Pt. XVII, 105(C). The permittee must comply with all conditions of a permit. La. Admin. Code tit. 43, Pt. XVII, 107(D). The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control. La. Admin. Code tit. 43, Pt. XVII, 107(H). The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment. La. Admin. Code tit. 43, Pt. XVII, 107(G).³³

Texas Brine was always the operator of the OG3 well. According to Mr. Ball with LDNR, the operator of a well is solely responsible for its well in the eyes of the Office of Conservation. Likewise, Drs. Passaris and Thoms testified that Texas Brine, as the operator, had the duty to manage the well and to make sure it did not grow too close to the salt dome edge. In fact, Dr. Ratigan specifically

³² We further note the absence of jurisprudence regarding the duty of an operator during actual operation of a mine/cavern system. Instead, the case law found involved duties regarding surface repair and restoration once mining is complete or the failure to explore for minerals or to mine when minerals are found.

³³ We note the fact that this incident prompted the enactment of a new section of the Administrative Code in order to better address issues that occur with solution-mining injection well activity in Louisiana. See La. Admin. Code tit. 43, Pt. XVII, 3301 et. seq.

warned Texas Brine about operating in the OG3 because he knew the ultimate responsibility would fall on the operator.

Mr. Martin testified that as operator Texas Brine was to ensure that its facilities and systems are running safely and oversee all aspects of operations of mining, maintenance, and monitoring. Although Texas Brine could not make expenditures (only recommendations) without prior approval of either Legacy Vulcan or Oxy, it had the ability and duty to respond to and repair a leak immediately. Mr. Tichenor testified that as operator, he expected his customer (Legacy Vulcan or Oxy) to rely upon Texas Brine to safely and properly operate the wells, to manage the well and cavern development, and to determine what diagnostic tests or work-overs may be necessary. Mr. Tichenor further testified that Texas Brine actively monitored the shape of the well and looked to see if it was getting near the edge of the salt dome, which is what Texas Brine did each time it ran sonar. Texas Brine also collected data on pressures and brine quality measurements, which would indicate whether the well was in isolation or in communication with outside sediments. Mr. Cartwright also testified that Texas Brine had the duty of monitoring, interpreting, and checking the cavern/wells' pressures, gauges, and other data.

Based on the law, regulations, and agreements between the parties, we find, although the mineral lessee was Legacy Vulcan, and later Oxy, Texas Brine took on the role of operator. This shifted the majority of Legacy Vulcan's duties to Texas Brine. However, we agree with the district court's findings that Legacy Vulcan, and later Oxy, maintained a general duty to act as a prudent mineral lessee. Legacy Vulcan and Oxy retained the ultimate power to shut down an existing well, drill a new one, and had power over large capital expenditures in regards to any given well/cavern on the property. Texas Brine retained the duties associated with actually operating, maintaining, and monitoring brine production relative to the

Salt Lease. A similar division of duties subsequently existed between Oxy and Texas Brine.

As between Legacy Vulcan and Oxy, we find Legacy Vulcan owed a duty to disclose the risks associated with the caverns on the North 40 upon the sale of Legacy Vulcan's chloralkali business which included the Salt Lease to Oxy. If the former owner, prior to the sale of property, knows of a defective condition and conceals the problem, rather than repairing or at least advising of the condition, it may be responsible for plaintiff's injuries. **Learson v. Bussey**, 96-2339 (La. App. 4th Cir. 3/26/97), 691 So.2d 1301, 1303, writ denied, 97-1039 (La. 6/13/97), 695 So.2d 988. See also **Bayer v. Omni Hotels Management Corp.**, 2007-0866 (La. App. 4th Cir. 8/27/08), 995 So.2d 639, 642, writ denied, 2009-0107 (La. 3/27/09), 5 So.3d 142, recognizing that the former owner of property can be held liable for defective conditions in the property if the former owner knew of the defective conditions prior to the transfer of the property and concealed those problems. The subsequent sale of the property, as a matter of law, does not automatically absolve the former owner of its negligent acts. At the very least, the former owner has a duty to advise or make the new owner aware of conditions that could pose a danger to others. **Id.** Thus, despite Legacy Vulcan's arguments to the contrary, where a defective thing is involved, not only can its owner be responsible for damages, but also the party who actually created the risk whether or not he is the owner. **Id.**

Breach

While the existence of duty is a question of law, whether that duty was breached is a question of fact. **Ethyl Corporation v. Gulf States Utilities, Inc.**, 2001-2230 (La. App. 1st Cir. 10/2/02), 836 So.2d 172, 178, writ denied, 2002-2709 (La. 12/19/02), 833 So.2d 340. We look to the record to determine if breach of the parties' respective duties was established and whether those breaches were the

cause in fact of the OG3 cavern failure that led to the sinkhole, as previously determined.

Legacy Vulcan

Legacy Vulcan was the lessee of the Salt Lease from 1976 until 2005. During that time, it owed the duty of a prudent lessee over the property, even though it contracted out most of its operating duties to Texas Brine. Legacy Vulcan retained the duty to prudently approve the siting and drilling of new wells, retire wells, and approve major capital expenditures. Also during this time, Legacy Vulcan and Texas Brine freely shared information regarding the status of their caverns and wells.

Prior to authorizing the drilling of the OG3, Legacy Vulcan was aware of the proximity of the salt dome edge and that its borders were not well defined. This obligated Legacy Vulcan to proceed with caution with the drilling of its third well. Legacy Vulcan looked to its operator, Texas Brine, for guidance. In response, Texas Brine presented Legacy Vulcan with a location to drill based on analysis by its outside consultant, Mr. Toups. Legacy Vulcan also consulted with an outside authority, Mr. Sevenker. He suggested drilling a shallower well at a depth of 5,000 feet, rather than 6,000 feet. Mr. Sevenker felt this would be more prudent based on the unknown location of the salt dome edge. When Legacy Vulcan suggested the theory of the shallower well, Texas Brine responded with a series of points as to why a deeper, 6,000-foot well would be more prudent. Legacy Vulcan ultimately agreed to drill the OG3 in the location recommended by Mr. Toups and at the depth originally agreed to by the parties.

During the drilling of the OG3, gas formed. This raised concerns for Legacy Vulcan, as the OG1 had also experienced gas formation and ultimately resulted in being drilled through to non-salt rock. Legacy Vulcan requested that Texas Brine study the gas, which it did. Texas Brine informed Legacy Vulcan that, unlike the

OG1, this gas was entrenched within the salt and was not due to proximity of the salt dome edge.

The OG3 grew in “text book” fashion over the first fifteen years under the operation of Texas Brine. Around 1997, Legacy Vulcan informed Texas Brine that it was expanding its operations and would require double the production of brine. Texas Brine suggested that the existing wells could handle the production, but the salt reserves would be exhausted more quickly. Therefore, Texas Brine suggested Legacy Vulcan drill a fourth well on another part of the dome, the “White Castle Option.” Notably, the “White Castle Option” did not call for immediate retirement of the OG3, nor did Texas Brine raise any concerns regarding the integrity or operational safety of the OG3 at this time. Texas Brine further suggested that Legacy Vulcan retain the services of an outside company to assist in Legacy Vulcan’s decision on how to expand.

Legacy Vulcan contracted with Dr. Ratigan, who produced a series of RE/SPEC reports. All of the reports reiterated that the location of the salt dome edge was unknown, which presented a level of uncertainty in making any determinations regarding new well sites on the Salt Lease property. The RE/SPEC reports suggested that the existing wells, especially the OG2 and the OG3, were very close to, if not already intersecting, the salt dome edge. Therefore, if production was to double, the cavern roofs should be raised in order to get away from mining at the base of the caverns. The report further suggested a geomechanical study be done prior to any major changes within the caverns.

At trial, Texas Brine asserted that Legacy Vulcan was liable for not following the directives and warnings of Dr. Ratigan, even though Texas Brine originally questioned Dr. Ratigan’s findings, contradicted each point made, and assured Legacy Vulcan that production could be doubled while maintaining the current brine operation.

The March 1998 RE/SPEC report was revised, taking Texas Brine's points into consideration. Ultimately Texas Brine's view that mining could continue as is was supported by the April 1998 RE/SPEC report with the suggestion that sonar be run more often to monitor cavern growth. Legacy Vulcan doubled production, and the cavern continued to grow.

In 2003, Texas Brine approached Legacy Vulcan with another "option" to drill a fourth well elsewhere, but never suggested taking any of Legacy Vulcan's current wells out of service for any reason, especially not for safety reasons. The option was only available to Legacy Vulcan for three months and was then rescinded by Texas Brine.

Around 2005, Legacy Vulcan sold its chloralkali business to Oxy. In the negotiations leading up to the sale, Legacy Vulcan provided Oxy with an estimate of salt reserves in the three caverns, but intentionally omitted the portion of Texas Brine's report that noted that the OG3 was near the salt dome edge, and therefore, its useful life was questionable. After the sale, Legacy Vulcan's involvement in the Salt Lease property and the three wells/caverns ceased.

Legacy Vulcan had the ultimate duty to reasonably place its wells and also retire wells. Testimony at trial established that the OG3's placement near the salt dome edge, although precarious, was not necessarily unreasonable as there are five other wells placed within 100 feet of a salt dome edge in Louisiana. Expert testimony also established that any risks associated with initial placement of the OG3 were "moot" based on the following twenty five years of "text book" growth and lack of any mechanical integrity issues.

Legacy Vulcan had the general duty to act as a prudent lessee upon the land on which it facilitated the production of brine. Although it is evident that Texas Brine had the duties to prudently operate the wells and develop the caverns, Legacy Vulcan retained certain responsibilities and benefited from this activity. It

received the same information in the 1998 RE/SPEC reports as Texas Brine – that the cavern had potentially intersected the salt dome edge – and authorized Texas Brine to double production within the existing wells. Thus, we find no error in the district court’s finding that Legacy Vulcan breached its duty as a prudent lessee and was responsible, along with Texas Brine, for the thinning of the walls of the OG3 cavern from 1976 until 2005, which was previously identified as a cause-in-fact of the sinkhole.

We further find that the district court was not manifestly erroneous in finding Legacy Vulcan breached its duty when it failed to warn Oxy of the closeness of the OG3 to the edge of the salt dome. Legacy Vulcan intentionally omitted the portion of the 2004 email that specifically stated that the OG3 posed the biggest concern on the North 40, as the data and Dr. Ratigan suggested that the OG3 was very close to the edge of salt and at real risk of being lost prematurely and without notice. We acknowledge that Oxy was a sophisticated party with other wells in the area, but that did not relieve Legacy Vulcan from its duty to warn or inform Oxy of the potential issues with mining on this land as it was close to the salt dome edge.

Oxy

Oxy took over the wells and contracts, with Texas Brine as its operator, in 2005. The record is clear that the two parties had a sordid past, and perhaps there was less trust between Oxy and Texas Brine than there had been previously between Legacy Vulcan and Texas Brine. Nevertheless, Oxy was now the lessee of the Salt Lease and owed the duty of a prudent lessee over the property, including the duty to prudently approve the siting and drilling of new wells, retire wells, and approve major capital expenditures. Texas Brine had a continuing duty to follow state rules and regulations and to monitor and operate the wells in a reasonably prudent manner. Texas Brine made several proposals to Oxy for the

placement of new wells; however, none of these proposals included a plan to retire the OG3 or a warning that the OG3 was at risk for mechanical failure. Running out of salt was the key concern projected by Texas Brine, rather than any safety concerns.

In June 2008, Oxy received the Legend 3D data analysis with a dire warning from Dr. Ratigan to cease operation in the OG3 immediately, as there was evidence that it had intersected the salt dome edge. When Oxy shared Dr. Ratigan's findings with Texas Brine, Texas Brine proposed a further study, a VSP, believing the results or interpretation of the Legend 3D data to be flawed. Texas Brine continued to mine the OG3 on behalf of Oxy until March 2009, almost eight months after the initial recommendation to cease operations. Whether Oxy chose to ignore the intense warnings of Dr. Ratigan or whether there was simply a breakdown in communication with Texas Brine, the continued mining operations of the OG3 obviously added to the unnecessary growth of the cavern.

Instead of simply running a VSP test in order to confirm the integrity of the cavern and whether it had intersected with the salt dome, Texas Brine insisted on milling the roof of the OG3 cavern. Texas Brine advised Oxy that the milling operation was the necessary first step in order to get a clear image with the VSP. While this recommendation was completely erroneous, Oxy approved the capital expenditure and proceeded with the recommendation of its operator. The milling operation did not go smoothly, triggering a massive gas kick. Following the milling, attempts to pressurize the well were unsuccessful, and Texas Brine had suspicions that it was because the cavern was connected to outside rock. However, Texas Brine did not share this concern with Oxy.

Though no expert or witness could pinpoint the exact time the OG3 began to leak, the experts agreed that a milling operation, especially one that went as badly as the one in this case, added stress to the entire cavern and would exacerbate any

leak that already existed. Moreover, pressuring up the OG3 post-milling would have likewise added unnecessary stress to the cavern.

Once it was clear that the OG3 lacked integrity and could no longer be mined, there were two choices left for the OG3, monitor or plugging and abandoning. Initially, Oxy, Dr. Ratigan, and Texas Brine agreed that monitoring was the way to proceed; however, monitoring only lasted approximately six months before the plugging and abandoning was accomplished. Prior to the plugging and abandoning, Oxy learned from Dr. Ratigan that there was a suspected leak in the cavern rather than just the well. Texas Brine also knew of this leak. We acknowledge the uncontradicted testimony established that little could be done to fix the cavern leak, and none of the witnesses testified that a cavern leak would necessarily result in cavern failure. However, the experts agreed that a cavern leak should be monitored until it demonstrates stability and only then should plugging and abandoning occur. Texas Brine proceeded with the plugging and abandoning plan, which was approved by Oxy and Dr. Ratigan, without advising LDNR of the cavern leak.

Based on the foregoing evidence that was presented in the record, we cannot find that the district court was manifestly erroneous in finding that Oxy breached its duty by not immediately retiring the OG3 when Dr. Ratigan's interpretation of the Legend 3D data advised of same, but instead allowing further growth of the cavern. The district court also did not err when it found that Oxy breached its duty by failing to order continual monitoring of the OG3 rather than approving the plugging and abandoning when there was a known cavern leak at the time.

Texas Brine

We agree with the district court that Texas Brine breached its duty to prudently operate the OG3. Although the district court did not specify each action by Texas Brine that it found to be a breach, we find the record is replete with

instances to support the district court's finding. Texas Brine recommended that Legacy Vulcan obtain a second opinion in 1998 regarding its proposed expansion of brine mining on the Salt Lease property and suggested that Legacy Vulcan consult with Dr. Ratigan. However, Texas Brine then contradicted every point in Dr. Ratigan's report. Texas Brine disagreed with Dr. Ratigan regarding how close the OG3 was to the salt dome edge and insisted that mining the caverns could continue. Rather than encourage a geomechanical study of the Salt Lease property to better understand the lay of the rock, as was Texas Brine's duty, it suggested no such study was needed. Apparently, Texas Brine's resistance was so strong that the RE/SPEC report was revised to reflect its recommendations and opinions. Consequently, mining continued. This was a clear operational breach by Texas Brine.

The same type of breach is seen in Texas Brine's response to the Legend 3D data analysis. Rather than take heed of Dr. Ratigan's recommendation and cease mining, operations continued for another eight months until termination of the operation was made in writing as Texas Brine required. The evidence showed that this time, Texas Brine suggested that more tests be done in hopes to disprove what the Legend 3D data analysis showed; however, it appears that Texas Brine's tests did more harm than good. A VSP was recommended to and approved by Oxy, but before it could be run, Texas Brine suggested that the casing within the OG3 needed to be removed in order to get a clearer image. Texas Brine admitted, along with other experts who were asked about this procedure, that such a milling operation was unnecessary and ill-advised. Texas Brine also testified that a known risk of milling is the loss of mechanical integrity, of which it did not warn Oxy. This risk was reiterated by the experts who testified that a milling procedure, along with pressuring up a well, would cause stress on the cavern. The experts explained this would not necessarily cause a leak but would exacerbate one that already

existed. Thus we find that Texas Brine breached its duties as a prudent operator when it milled and pressurized the OG3, rather than run the VSP, and exacerbated any damage that was already present within the cavern. In as much as the district court did not make such a finding, we find it manifestly erred.

Finally, once it was abundantly clear that the OG3 had breached the salt dome edge and when UBS deemed it was no longer practical to monitor, it began drafting a plugging and abandoning plan. Rather than act as a prudent operator and recommend further monitoring, knowing that there was a leak in the cavern, Texas Brine proceeded with plugging and abandoning the cavern, which the experts testified was the worst possible thing to do. The district court was not manifestly erroneous in finding this was a breach on the part of Texas Brine. Moreover, we note that Texas Brine breached its duty as an operator to inform LDNR of the cavern breach. This was a duty clearly established by regulation and held solely by Texas Brine, and we find the district court was manifestly erroneous in not finding Texas Brine breached this duty.

Comparative Fault

As to the allocation of fault, the trier of fact is bound to consider both the nature of the conduct of each party at fault and the extent of the causal relation between the conduct and the damages claimed. **Watson v. State Farm Fire and Casualty Insurance Co.**, 469 So.2d 967, 974 (La. 1985). In assessing the nature of the conduct of the parties, various factors may influence the degree of fault assigned, including: (1) whether the conduct resulted from inadvertence or involved an awareness of the danger; (2) how great a risk was created by the conduct; (3) the significance of what was sought by the conduct; (4) the capacities of the actor, whether superior or inferior; and (5) any extenuating circumstances that may require the actor to proceed in haste, without proper thought. **Id.**

We note at the outset that the district court allocated 10% fault for the cause of the sinkhole to UBS. As we mentioned earlier, because UBS did not perfect a timely appeal or answer to contest this allocation, we find this allocation of fault to be final and leave this portion of the district court's judgment undisturbed.

The district court found that Legacy Vulcan and Texas Brine were both responsible and at fault for pre-2005 growth of the OG3 cavern and its contribution to the causation of the sinkhole. Next, the district court found Oxy and Texas Brine equally responsible for post-2005 growth of the OG3 cavern and its contribution to the sinkhole. Finally, the district court found Oxy and Texas Brine equally responsible for the untimely plugging and abandoning of the OG3 and its contribution to causation of the sinkhole. Concerning the AH-1, the district court cited the testimony of Dr. Nagel, who found the presence of the depleted AH-1 reservoir adjacent to the OG3 to be an essential factor that turned the leaking OG3 cavern into the sinkhole. Based on this finding, the district court allocated the majority of fault to the Oxy Entities because they were in the best position to address the ongoing nature of the AH-1 reservoir and its relationship with the brine mining operation of the North 40.

If an appellate court finds a clearly wrong apportionment of fault, it should adjust the award, but only to the extent of lowering or raising it to the highest or lowest point respectively that is reasonably within the trial court's discretion. **Dennis v. The Finish Line, Inc.**, 99-1413 (La. App. 1st Cir. 12/22/00), 781 So.2d 12, 27, writ denied sub nom., **Dennis v. Finish Line, Inc.**, 2001-0214 (La. 3/16/01), 787 So.2d 319.

As previously mentioned, the district court's conclusion that the AH-1 caused or contributed to the formation of the sinkhole was unsupported by the evidence and the finding, therefore, is manifestly erroneous. Consequently, we find the district court further erred in allocating any fault to Oxy Petro, OXY USA,

and Oxy for any actions that may have been taken in regard to the AH-1. Thus, this portion of the allocation of fault must be adjusted, with Oxy Petro and OXY USA being apportioned no fault. This necessarily also lessens the fault apportioned to Oxy.

Having found that the district court was clearly wrong in apportioning fault to Oxy Petro and OXY USA, and to some degree Oxy, this court must make an adjustment. However, before doing so, we must reexamine the allocations of fault to the remaining parties to determine whether the court's allocation of fault between those parties was manifestly erroneous. **Dennis**, 781 So.2d at 27. Turning to the actual causes of the cavern collapse – the growth of the cavern towards the salt dome edge creating a dangerously thin salt web and the plugging and abandoning – and the parties responsible for those causes, we review the remainder of the district court's allocation of fault.

Legacy Vulcan

We begin with Legacy Vulcan, the lessee of the North 40 between 1976 and 2005. We previously found that the district court was not manifestly erroneous in finding that Legacy Vulcan breached certain duties, including its duty as a prudent lessee by authorizing the doubling of production on the North 40 and growing the OG3 cavern, which drastically diminished the salt web.

As lessee under the Salt Lease, Legacy Vulcan was aware that the cavern wall was close to the salt dome edge when it called to double the production of brine. By 1998, it knew that its production requirements had thinned the OG3 cavern wall to the point of potentially intersecting with the salt dome edge and that the risk of thinning the cavern walls was great, especially at an accelerated rate of production. Despite this knowledge, Legacy Vulcan doubled production. Legacy Vulcan had the power to retire the OG3 but chose not to, putting economic benefit over safety.

We further found the district court was not manifestly erroneous in finding that Legacy Vulcan breached its duty to disclose information during its sale of its chloralkali business to Oxy. Fearful that Oxy would back out of the acquisition, Legacy Vulcan withheld critical information regarding the OG3 cavern's growth towards the salt dome edge, which had continually raised concerns for Legacy Vulcan. Without warning, Oxy took over the brine production at the accelerated pace set by Legacy Vulcan, which eventually caused the cavern to lose mechanical integrity in a matter of a few short years.

Legacy Vulcan was aware of what it was doing at the time of sale by intentionally withholding this critical information from Oxy. The risk of nearing and even breaking through the salt dome edge was great as there had already been warning signs that the edge was close. Withholding this information was also significant because it was done purely for Legacy Vulcan's economic benefit. Legacy Vulcan, as a fairly sophisticated party and as the party negotiating with Oxy, was also in the best position to inform Oxy of the edge of dome concerns. Moreover as the negotiations of the sale took several months to complete, we find Legacy Vulcan had ample time to warn Oxy about the dome edge concerns. Therefore, based on the foregoing, we find the district court was not manifestly erroneous in finding Legacy Vulcan to be 15% at fault for the cause of the OG3 collapse and resulting sinkhole.

Oxy

We next turn our attention to Oxy. Although Oxy may have been unaware of the exact status of the OG3 at the time of acquisition, as a sophisticated party, it quickly comprehended the status of its new well. Further, although the cavern only grew about fourteen feet while Oxy was lessee, we agree with the district court that this growth was critically important. In June 2008, Dr. Ratigan unequivocally advised Oxy that the OG3 was incredibly close to the salt dome edge, meaning the

risk of breaking through was quite high. Dr. Ratigan sternly warned Oxy that the OG3 should be shut down immediately. Rather than act with haste on this information, Oxy waited eight months to confirm that Texas Brine, its operator, had actually stopped mining in the OG3.

Allowing the OG3 to continue to be mined even after Dr. Ratigan's stark warning was done with awareness of the danger of potentially compromising the integrity of the cavern. The continual mining in the OG3 was purely for economic gain, as Oxy still required a certain quantity of brine to be produced from its North 40 wells, which necessarily included the OG3, in order to maintain its business needs. Although the agreements between Oxy and Texas Brine gave Texas Brine the freedom to mine in the way it saw fit, including choosing which caverns were run, it is clear that had Oxy forced the issue, Texas Brine would have had no choice but to stop mining the OG3. Last, there were no extenuating circumstances that excused Oxy from turning a blind eye on the production of brine from the OG3 following the warning to cease mining in the well. The district court took note of these facts and allocated fault to Oxy based on its role in the post-2005 growth of the cavern, in which we find no error.

Likewise, we find no error in the district court's allocation of fault to Oxy based on the manner in which it shut down the OG3, namely its involvement in the plugging and abandoning. Although Texas Brine, as operator, along with UBS, its subsidiary, developed the plugging and abandoning plan of the OG3 knowing that a cavern leak existed, Oxy had the same knowledge and outside experts suggesting that the OG3 be continually monitored rather than proceeding with the plugging and abandoning plan at the time. Despite the independent advice, Oxy quickly agreed with its operator to the plugging and abandoning. We note some conflicting testimony regarding the plugging and abandoning and whether a leak was really that concerning at the time; however, all the experts agreed that, in

hindsight, the plugging and abandoning was the worst thing to do. We cannot say that this action was inadvertent or that the risk was small, as there was knowledge of a cavern leak, which could not be monitored once the plugging and abandoning was performed. Oxy was the ultimate actor in the plugging and abandoning as it could not be accomplished without funding from Oxy. We cannot find any extenuating circumstances that would cause Oxy to act in haste in plugging and abandoning the OG3. Rather, Oxy was motivated by a desire to rid itself of a cavern that had become quite problematic.

Thus, we find no manifest error in the district court's finding that Oxy is equally responsible with Texas Brine for the post-2005 growth as well as the plugging and abandoning of the OG3. However, because we previously determined that the district court's allocation of fault to Oxy was manifestly erroneous – regarding the portion allocated based on Oxy's involvement with the AH-1 – this requires a lowering of the percentage of fault allocated to Oxy. For the foregoing reasons, Oxy is allocated 30% fault.

Texas Brine

Last, we address the fault of Texas Brine. Texas Brine was involved with the growth of the cavern from its inception to its demise. It was the only party that constantly monitored all of the caverns on the North 40, including the OG3, taking and keeping the data regarding pressure inside the cavern, measures of gas, quality of the brine, and shape and growth of the cavern. When gas was initially discovered, Texas Brine was commissioned to investigate its source and found it to be entrenched in the salt. Texas Brine would observe the increasing gas accumulation throughout the life of the OG3, which was found to be an indicator of the proximity of the cavern to the salt dome edge and, later, a culprit in masking the cavern leak. Texas Brine also encouraged its lessee to accelerate mining in the OG3 in 1998 after outside experts warned of the cavern growing close to the salt

dome edge and recommended, at least initially, that mining be altered. Texas Brine would once again disagree with outside expert analysis of the OG3 in 2008 with the release of the Legend 3D data. Rather than heeding Dr. Ratigan's warning that the base of the cavern was dangerously close to breaking through the salt dome edge and that operation within the OG3 should cease immediately, Texas Brine disputed the results and continued to mine for another eight months until Oxy mandated that operation in the well be terminated. Texas Brine then recommended an "ill-advised" milling and pressuring venture, which put additional and unnecessary stress upon the OG3.

Texas Brine's actions in operating the OG3 in such a way as to grow it towards the salt dome edge was done with an involved awareness that the OG3 could break through salt. Continuing such operation, without analyzing the data that Texas Brine itself was producing, encouraging more in-depth tests, or altering the mining operation was done at great risk that the OG3 would break through the salt and therefore compromise its integrity. Texas Brine, as the operator, was in charge of how the caverns developed and, at the very least, could have raised concerns regarding integrity issues of the OG3. There also appear to be no extenuating circumstances that would cause Texas Brine to operate the OG3 as it did, without investigating any of the warnings given.

In addition to Texas Brine, its subsidiary UBS, was also intricately involved in the plugging and abandoning of the OG3 cavern, with UBS making the determination that it was no longer beneficial to monitor the cavern and drafting the proposal of the plugging and abandoning to submit to the LDNR. In spite of its duties, Texas Brine did not advise the LDNR that the OG3 contained a cavern leak, although it knew of such a leak or leaks following the unsuccessful milling and preMIT. The testimony at trial revealed that nothing could be done to fix a cavern leak, but it was known that the OG3 was losing pressure. Rather than

recommending further monitoring based on these two facts, Texas Brine chose to advocate for the plugging and abandoning of the OG3, knowing it would no longer be able to monitor the leaking cavern. While Oxy was required to fund and, therefore, approve the plugging and abandoning, Texas Brine, as operator, chose how to end the life of the cavern that it operated to integrity loss. Last, there does not appear to have been a reason for Texas Brine to act in haste in the plugging and abandoning of the OG3, rather than allowing for longer monitoring.

We find no manifest error in the district court's finding that Texas Brine is equally responsible with Oxy for the post-2005 growth of the cavern as well as the plugging and abandoning of the OG3. We further find no manifest error in the district court's finding that Texas Brine is also responsible for the OG3's pre-2005 growth. Because we found it necessary to adjust the allocation of fault based on our finding that the AH-1 was not a causative factor in the formation of the sinkhole, Texas Brine's percentage of fault must likewise be adjusted and increased to 45%.³⁴

CONCLUSION

For the foregoing reasons, the district court judgment dated April 18, 2018, allocating fault for the cause of the sinkhole is reversed in part, amended in part, and affirmed in part. That portion of the judgment allocating 40% of fault to Occidental Chemical Corporation is reversed. That portion of the judgment allocating 5% of fault to Occidental Petroleum Corporation is reversed. That portion of the judgment allocating 5% of fault to OXY USA Inc. is reversed.

We amend that portion of the judgment that allocated 40% of fault to Occidental Chemical Corporation to reflect the allocation of 30% of fault to Occidental Chemical Corporation. We further amend that portion of the judgment

³⁴ After a thorough review of the record before us in this matter, we find the district court was not manifestly erroneous in not allocating fault to Dr. Ratigan.

that allocated 25% of fault to Texas Brine Company, LLC to reflect the allocation of 45% of fault.

We affirm the remainder of the district court's judgment, allocating 15% of fault to Legacy Vulcan, LLC f/k/a Legacy Vulcan Corp. and/or Vulcan Materials Company. We further affirm the district court's judgment allocating 10% of fault to United Brine Services Company, LLC.

Each party shall bear its own costs on appeal.

REVERSED IN PART; AMENDED IN PART; AFFIRMED IN PART.³⁵

³⁵ Occidental Chemical Corporation's motion to supplement illustrations for its original brief filed on June 3, 2019 is granted; Texas Brine Company, LLC's motion to supplement the appellate record filed on September 24, 2018 is granted; Texas Brine Company, LLC's motion to stay phase 1 appeal considering supplemental production of documents by Legacy Vulcan, filed on October 29, 2019, and Texas Brine Company, LLC's motion for limited remand regarding reallocation of fault due to newly produced documents by Legacy Vulcan filed January 31, 2020, are denied.