

**NOT FOR PUBLICATION WITHOUT THE
APPROVAL OF THE APPELLATE DIVISION**

This opinion shall not "constitute precedent or be binding upon any court." Although it is posted on the internet, this opinion is binding only on the parties in the case and its use in other cases is limited. R. 1:36-3.

SUPERIOR COURT OF NEW JERSEY
APPELLATE DIVISION
DOCKET NO. A-2636-21

SANDRA DORRELL and
SANDRA DORRELL t/a OLD
ALLOWAY MERCHANDISE,

Plaintiffs-Respondents,

v.

WOODRUFF ENERGY INC.,
HARLEYSVILLE GROUP, INC.,
HARLEYSVILLE INSURANCE
COMPANY and FARMERS
MUTUAL FIRE INSURANCE CO.
OF SALEM COUNTY,

Defendants,

and

CHEVRON U.S.A. INC. as successor
to GULF OIL CORPORATION,

Defendant-Appellant.

Argued September 28, 2023 – Decided December 31, 2024

Before Judges Vernioia, Gummer and Walcott-Henderson.

On appeal from the Superior Court of New Jersey, Law Division, Salem County, Docket No. L-0343-11.

Matthew S. Slowinski argued the cause for appellant (Slowinski Atkins, LLP, attorneys; Matthew S. Slowinski, on the briefs).

Louis Giansante argued the cause for respondents Sandra Dorrell and Sandra Dorrell t/a Old Alloway Merchandise (Giansante & Associates, LLC, attorneys; Louis Giansante, of counsel and on the brief).

The opinion of the court was delivered by

VERNOIA, J.A.D.

The matter arises out of plaintiff Sandra Dorrell's claim that Chevron U.S.A., Inc. (Chevron), as successor to Gulf Oil Corporation (Gulf), is liable for private contributions under the New Jersey Compensation and Control Act (the Spill Act), N.J.S.A. 58:10-23.11 to -23.11z, for gasoline contamination in the soil and groundwater on property she purchased in 1984. In our prior opinion on Chevron's cross-appeal from the judgment entered after a bench trial, we remanded for the court to conduct a N.J.R.E. 104 hearing to determine the admissibility at the trial of the testimony of one of plaintiff's experts, Craig Hopkins, a licensed site remediation professional (LSRP), who had been qualified at trial as an expert in subservice investigations, particularly of

petroleum hydrocarbons.¹ Dorrell v. Woodruff Energy, Inc. (Dorrell II), No. A-3144-17 (App. Div. Mar. 11, 2021). Chevron appeals from an April 5, 2022 decision and order, entered following a two-day hearing by the remand court, finding Hopkins had been properly qualified at the time of trial to offer an opinion gasoline is a contaminant on the property and had used a reliable methodology as the basis for that opinion as well as his opinion concerning the causation. We reverse.

I.

To provide context for our discussion of the parties' arguments, we summarize the facts pertinent to our disposition of the issues presented on appeal. We first address our decision in Dorrell II remanding the issues of Hopkins's qualifications and methodology to the trial court. We then summarize the evidence presented to the remand court and its decision.

Our Decision To Remand To The Trial Court

¹ The long history of this matter also includes a prior appeal from an order dismissing plaintiff's complaint on statute-of-limitations grounds. We reversed the order and remanded for further proceedings. Dorrell v. Woodruff Energy, Inc. (Dorrell I), No. A-3585-13 (App. Div. Sept. 30, 2015). The disposition of that appeal has no bearing on the issues presented here.

Plaintiff purchased the property in 1984. Years before the purchase, and until the early 1960's, a general store located on the property had sold gasoline, as well as kerosene. Decades later, as plaintiff prepared to sell the property, it was discovered that the property's soil and groundwater were contaminated with petroleum products. Two potential sources of the contamination were identified: the first was a pair of aboveground fuel-oil tanks located within, and adjacent to, the general store; and the second was a 1,000 gallon underground storage tank (UST) located beneath a sidewalk adjacent to the store and 550 gallon USTs that evidence showed had been replaced by a 1,000 gallon UST in the late 1950s. The USTs had been used to hold gasoline that was sold from the store's gasoline dispensers. One of the aboveground tanks, which was located in the store's basement, had ruptured in the 1990s, causing fuel oil to seep into the ground. The second aboveground tank, which had a 275-gallon capacity, had been overfilled, causing another spill of fuel oil onto the ground.²

In 2011, plaintiff filed a complaint, which was later amended, alleging that Woodruff Energy, Inc. had contaminated the property by overfilling the

² The evidence showed that when Dorrell purchased the property, a 1,000 gallon aboveground tank was in place and was used to supply fuel oil to a furnace. In the mid-1990s, Dorrell installed the 275-gallon aboveground fuel oil tank for that same purpose.

275-gallon aboveground fuel oil tank and that Gulf, now Chevron, had contaminated the property with gasoline from the 1,000-gallon UST. Against each defendant, plaintiff asserted claims for breach of contract, negligence, nuisance, and trespass. Plaintiff sought compensatory and punitive damages and an order directing that defendants indemnify her from any future claims and suits related to the soil and groundwater contamination and requiring defendants to pay for all testing and cleanup under the Spill Act.³

In orders dated November 22, 2013, and February 28, 2014, the court granted summary judgment in favor of Woodruff and Chevron, finding plaintiff's causes of action barred by the six-year statute of limitations, N.J.S.A. 2A:14-1. Dorrell I, slip op. at 2. As noted, we reversed the court's orders and remanded for further proceedings on plaintiff's complaint. Id. at 2, 6-7.

Plaintiff filed a second amended complaint in 2016, reframing her common-law claims as statutory causes of action under the Spill Act. At the bench trial on that complaint, plaintiff testified and called as an expert Craig Hopkins, an LSRP with a Bachelor of Science degree in earth science. The court qualified Hopkins as an expert in subsurface investigations involving

³ Plaintiff also asserted breach-of-contract and bad faith denial-of-coverage claims against various insurance companies. The disposition of those claims is not at issue on this appeal.

hydrocarbon contamination but found he was not qualified to distinguish one type of petroleum product from another. Based on his physical examination of the site, a review of its history, and a consideration of relevant topographical conditions, and analysis of various test results, Hopkins concluded the soil and soil groundwater had been contaminated with petroleum products. Over Chevron's objection, Hopkins also testified that based on the combined presence of hydrocarbons and lead in the local groundwater, the source of contamination was likely leaded gasoline from the 1,000-gallon UST and Chevron was responsible for the discharge.

Plaintiff also presented at the trial the de bene esse depositions of Bruce Torkelson of Torkelson Geochemistry, a professional in environmental forensic science with a Master of Arts degree in geoscience, and Alan Jeffrey of Pace Analytical, an analyst with a Doctor of Philosophy degree in organic geochemistry and oceanography. Based on tests he had conducted, Torkelson concluded that samples from plaintiff's property were most likely contaminated by kerosene or jet fuel. Based on Pace Analytical's testing, Jeffrey concluded that samples from the site contained weathered diesel or fuel oil, although the court would later exclude portions of Jeffrey's testimony. Neither Torkelson nor

Jeffrey testified they had found chemical evidence of gasoline contamination at the property.

In a decision following the bench trial, the court found Woodruff not liable and dismissed all claims against it. The court found Chevron not liable for any fuel oil or kerosene contamination. However, the court found sufficient evidence of gasoline contamination attributable to Chevron to order further investigation of the property and, if appropriate, remediation of gasoline contamination at Chevron's expense.

Chevron moved for a judgment notwithstanding the verdict or, in the alternative, a new trial. Chevron argued: Hopkins was not qualified to identify gasoline contamination; there was no competent evidence the UST had leaked gasoline; and Chevron should not have been assigned sole responsibility for the UST. In an October 2, 2018 order, the trial court denied Chevron's motion, finding Chevron had not demonstrated a miscarriage of justice by clear and convincing evidence such that it was entitled to either a judgment notwithstanding the verdict or a new trial.

Plaintiff appealed from the no-cause verdict against Woodruff, and Chevron cross-appealed from the verdict and denial of its post-trial motions. Chevron argued the court had erred by holding it responsible for investigation

and remediation because there was no competent evidence of gasoline contamination in the soil or groundwater and the trial court "relied on the net opinion of an expert[, Hopkins,] unqualified to identify petroleum contaminants, or to opine about causation of contamination." Dorrell II, slip op. at 5-6. We affirmed the verdict in Woodruff's favor. Id. at 26-27, 40.

We determined that the "genuine factual controversy" on Chevron's cross-appeal "pertain[ed] to the court's finding that . . . the property was contaminated with gasoline from the 1,000 gallon UST." Id. at 7. We observed the trial court had relied on plaintiff's "sole expert on gasoline contamination," Hopkins, as the basis for its conclusion the property had been contaminated with gasoline from the UST. Ibid.

We noted that Hopkins had not been qualified by the court "to identify petroleum products based on chromatographic studies or hydrocarbon footprinting," and although he was an LSRP, held a degree in earth science, and had been involved in as many as 1,000 site investigations, he had never testified as an expert. Id. at 8. We further observed Hopkins had admitted he was not an expert in age dating and had sent out samples to a laboratory for it to determine the type of contaminants present because "that was not his 'expertise.'" Id. at 8.

As we explained, in response to Chevron's in limine motion "[t]he [trial] court [had] qualified Hopkins as an expert in investigating subservice conditions" but also determined "Hopkins was not qualified to identify a specific contaminant because he 'indicated that he can't identify the specific contaminant . . . [and] has to send that out for testing.'" Ibid. (alterations in original). We explained that the court had "also withheld qualifying [Hopkins] as an expert on proximate cause, although the court [had] left open the possibility he could be qualified later." Id. at 8-9. As it turned out, "the [trial] court did not expressly revisit the issue of Hopkins's qualifications to opine about causation." Id. at 9.

We also observed that at trial and over Cheron's objection, "the court had permitted Hopkins to opine, based on what amount[ed] to circumstantial evidence, that gasoline was present at the site, gasoline contamination was caused by discharges from the UST, and the UST was installed by Gulf." Ibid. We noted that in reaching his opinion, Hopkins had relied on his knowledge of the prior owner's use of the property; the locations of gasoline, pumps, and USTs; documents and contracts between the Gulf and the prior owners; historic maps; and his surveys of the property in its present condition; and "the interpretation of chemical analyses of samples from wells and soil-borings,

although none of those analyses included opinions that the samples contained gasoline." Ibid.

We further explained that although the trial court had "barred Hopkins from identifying the particular petroleum product found on site, [it] allowed him to opine that gasoline was found in soil and water samples." Id. at 12. We noted Hopkins had testified that a forensic lab analysis based on a review of chromatograms and other methodologies was unnecessary to identify particular petroleum products "when analyzing what he called 'dissolved phase samples' – by which he meant, petroleum products that had dissolved in groundwater." Ibid. Hopkins had testified he could base his opinion that gasoline was present in a sample on the constituent chemicals found in the sample, explaining that the presence of "total lead and four other chemicals – benzene, toluene, ethyl benzene and xylene – known collectively as BTEX" are "markers in a volatile run that's being done when you're targeting gasoline." Id. at 12-13.

Hopkins had also testified that based on contamination found near the UST, "there . . . was a release of petroleum hydrocarbons," id. at 13, that bore "signatures . . . indicat[ing] fuel oil, could indicate[] gasoline, [and] could indicate kerosene," ibid. at 13 (second alteration added), and that "[t]he total lead indicated it was likely there was a leaded gasoline release," ibid. Hopkins

then "opined the release occurred sometime between the 1920s and 1970s" from the UST or the two prior 550-gallon USTs that had been on the property that were removed when the 1,000-gallon UST was installed in 1958.

We further observed that Hopkins had conceded: he did not know what was stored in the UST; he never inspected the UST and had no evidence it had any holes or leaks; "total lead" is a common metal found in soil and groundwater"; "organic lead" is found in old leaded gasoline, but he never tested for it; and he asked a forensic lab to search for multiple components of leaded gasoline when testing samples from the property but had not asked for that testing for the samples taken from near the UST. Id. at 15. Hopkins also testified that soil borings near the UST showed no lead or BTEX levels above regulatory standards. Id. at 15-16.

As we noted in Dorrell II, Chevron's counsel repeatedly objected to Hopkins's qualifications to render an opinion as to the cause of the contamination. Id. at 16. The court overruled the objections, explaining that it would "'figure out' later if Hopkins has 'the qualifications to be able to say it's Gulf" that caused the contamination. Ibid.

We further summarized the trial court's finding that there was gasoline contamination at the property and its reliance on Hopkins's testimony that the

UST had contained gasoline. Id. at 20. The trial court also relied on soil borings from various locations at property showing the presence of certain chemicals, and the found the presence of lead in some of the samples established that lead gasoline had been present at the site. The court found Gulf more than likely owned the UST and that "it would have contained gasoline." Ibid. And the court concluded "Gulf is a responsible party for the gasoline contamination" and ordered Chevron to conduct tests to determine the nature and extent of the contamination and whether in fact the UST is Chevron's tank. Id. at 21. The trial court further explained Chevron was the responsible party for the gasoline contamination until it is demonstrated the UST "is not a gasoline storage facility" and, "if that occurs, then [Chevron's] responsibility ends." Ibid.

In our decision on Chevron's cross-appeal from the trial court's decision and order, we rejected Chevron's argument that it did not own and was not responsible for the UST or, in the alternative, that plaintiff and Woodruff should share in any investigative or cleanup costs associated with the contamination of the property. Id. at 27-28. However, we concluded the court had "abused its discretion by admitting Hopkins's opinion that the contaminant in the soil and water at the site was gasoline, absent a finding he was qualified to give it." Id. at 34.

We found Hopkins's reliance on the identification of chemical "signatures" and "markers" to be particularly problematic because he had not testified that he had the "training or experience to distinguish between various petroleum products . . . based on the kind of data he utilized." Id. at 35. We also expressed skepticism that Hopkins's status as an LSRP necessarily evinced a "qualification to identify specific petroleum contaminants" using Hopkins's methodology. Id. at 36. We further found the trial court had erred in allowing Hopkins to testify regarding causation without making an explicit finding that he was properly qualified to do so. Id. at 36-37.

We explained that "[e]ven assuming Hopkins was a qualified witness, the record d[id] not disclose that the facts and methods he used to identify gasoline, and attribute it to Gulf, were reliable," and his opinion may have been an inadmissible net opinion. Id. at 37. More particularly, we critiqued the omission of "scientific sources or evidence [demonstrating] that his methodology was reliable; or that it was generally accepted within the field." Ibid. Rather, we observed that "the evidence at trial disclosed other reliable methods of identifying gasoline and determining its sources," including testing for other signature chemicals, using specialized technology like chromatograms, and

testing the underground tank itself, each of which Hopkins had either used elsewhere on the property or had not used at all. Id. at 37-38.

We determined it necessary to remand for a N.J.R.E. 104 hearing "to determine the admissibility of Hopkins's opinions, both based on his qualifications and the reliability of his methodology." Id. at 38-39. We explained that if the trial court found Hopkins qualified and his methodology reliable, the judgment against Chevron should be enforced as written; if not, it should be vacated. Ibid.

The Remand Hearing

The remand court conducted a two-day hearing during which plaintiff presented Hopkins as a witness and Chevron presented Dr. Joseph Lifrieri, who testified in part that he holds a doctorate degree in geo-environmental engineering and works as an environmental-forensics expert. The remand record also includes documentary evidence.

Hopkins testified concerning his qualifications, explaining that in 1991 he had obtained a bachelor's degree in earth science and environment and later had been first licensed by the New Jersey Department of Environmental Protection (NJDEP) as a subsurface evaluator and then as an LSRP. He explained he had participated in a minimum of 1,000 site investigations, of which roughly eighty

percent involved petroleum releases, and he had attended professional education seminars and conferences, and the classes required to maintain his LSRP license. He further detailed the various employment positions he has held, including positions involving field sampling, performing simple testing, and supervising contaminated-site investigations.

Hopkins also identified what he described as sources of directives and guidance issued by the NJDEP to LSRPs, including the Technical Requirements for Site Remediation (N.J.A.C. 7:26E), the "actuarials" or "administrative requirements," and assorted situation-specific "technical guidance documents," including the "Field Sampling Procedures Manual." He explained that the NJDEP materials provide investigative methods that are reliable and that he had applied those methods, "mainly the technical requirements," in his investigation of plaintiff's property.

Asked about his qualifications to differentiate various petroleum products, Hopkins explained that, although some petroleum contamination could be handled by "subsurface evaluators," others could be handled only by LSRPs, who were more thoroughly vetted by, and integrated with, NJDEP. He testified contamination from an "unregulated" tank containing, for example,

heating oil, could be handled by an evaluator, whereas substances like gasoline required an evaluation by a LSRP.

Hopkins provided an overview of his initial investigation of the soil in the property's basement, where the aboveground fuel-oil storage tank had been located and had ruptured. He described the process of taking and analyzing soil samples that he testified was governed by a "field sampling procedures manual and . . . certain guidance documents." He explained that, based on "[e]xperience" and "knowing what [contaminants] smell like," he could discern whether a soil sample contained a petroleum contaminant based on smell alone and, "[i]f it's a new, fresh sample, you can tell if it's gasoline or fuel oil."

According to Hopkins, based on his initial analysis of the soil in the basement, which he found showed deep contamination that could not be attributed to the shallow fuel oil spill from the aboveground fuel oil tank, and documentary evidence showing the presence of gasoline dispensers and deliveries to the property in the past, he expanded his investigation. A subsequent geophysical survey showed that "there was an existing approximate 1,000 gallon underground tank still present" on the property that Hopkins concluded was "likely" a gasoline tank.

Hopkins also discussed the results of his sampling at the site, the chemical analysis of which was conducted by outside labs. He described "slotted screen interval" groundwater testing, a procedure which he asserted "create[d] usable data," explaining it was "authorized under DEP's technical regulations," and was "appropriate" for this type of investigation. He also explained that petroleum products can be detected in groundwater through the presence of: "measurable product" resulting from the separation of petroleum that floats on the surface of a sample; "sheen," a colorful manifestation which may be present even when petroleum is dissolved; or, as with soil sampling, an "odor." Hopkins further explained that the testing of "dissolved phase" samples, in which a petroleum product has been completely integrated in the groundwater, was governed by relevant DEP regulations and procedures and was a key component of LSRP site investigations.

Concerning the laboratory testing of the dissolved phase samples, Hopkins testified he had "done laboratory work" in the past and "was familiar with the procedures," but he did not offer any information concerning the testing methodology. He explained that he had relied on laboratory reports showing the presence and concentration of certain compounds during his investigation of the contamination at plaintiff's property.

He differentiated such testing from less common "fingerprinting" analysis using a chromatogram, which would sometimes be performed, but he testified was not required here to determine if gasoline was present. Hopkins testified that while he was not trained to perform such testing, he could read a chromatogram. Plaintiff introduced into evidence text from a NJDEP field sampling manual, stating laboratory data was "not 100 percent accurate but currently represents the best estimate of the true concentration of a contaminant" in a sample and thus required "comparison of field and laboratory data" to "provide some guidance on the validity of the field data."

Hopkins also testified about "weathering," a process by which the properties of a sample change as it ages through "absorption," "evaporation," or "biodegradation." He explained that a weathered gasoline sample could be distinguished visually as "darker" than a fresh sample and that based on his visual inspection of a sample of measurable product recovered from the property, it did not appear "extremely weathered."

Hopkins explained that NJDEP regulations in effect at the time he began his investigation at plaintiff's property directed that testing for leaded gasoline in soil or groundwater was to be conducted by sampling for "volatile organic compounds plus the toluene identified compounds and then total lead." He

testified that "at some point" the regulations changed such that soil testing included tests for "1,2-dibromoethane and 1,2-dichloroethene" whereas ground water testing "removed total lead" from its testing battery. Hopkins also testified that when he performed groundwater testing on the property in 2016, he included tests for 1,2-dibromoethane, 1,2-dichloroethene, and total lead. He explained lead testing was done "[b]ecause there was information that showed that there had been historic gasoline tanks when it would have been leaded gas."

Hopkins testified there were "sampling protocols" that supported lead testing "when looking for gasoline [in] dissolved phase groundwater samples," but he did not identify those protocols or their provenance. Hopkins also tested for lead in the soil because it was required and it could be "a piece of the puzzle, when it comes to putting together an investigation" and "could indicate or give you information that there was a leaded gas release."

Hopkins testified concerning two groundwater samples from plaintiff's property he had sent for laboratory testing: a "product sample" taken on the north side of the property, away from the UST, and a "sheen sample" taken from the store's basement. Hopkins did not testify about the results for the first sample, which had been tested by Pace Analytical. However, Hopkins testified that Torkelson had tested the sheen sample and concluded "it was a midrange

distillate, potentially fuel oil or kerosene." He explained that, for two sampling wells closer to the UST, groundwater testing could not be conducted because there was no product recoverable.

Hopkins also explained the related concepts of "groundwater contouring" and "hydraulic gradient," both of which showed the relative height of groundwater at different locations that helped determine the direction and speed of groundwater movement. He explained the information is relevant because the gradient is one of the factors that dictates the way in which a "plume" of contaminant spreads or migrates away from its source. According to Hopkins, the general practice is to compare "site specific data" with large-scale topography, including "the closest water bodies," to "get a general idea" of "which way the shallow groundwater is going to flow." He viewed this combined technique as "reliable" and consistent with the practice of other LSRPs.

Hopkins testified he had performed gradation testing at plaintiff's property and the methods he had used were derived from the NJDEP field sampling procedure manuals. He had also "looked at the property in relation to the topography of the site and the surrounding elevation changes," a process which, he testified, was based on "general information" in the sampling manuals,

although his recollection on the topic was "not that detailed." According to Hopkins, his review of that information enabled him to ascertain the direction of groundwater flow.

Hopkins also explained the manner in which he had conducted the investigation at plaintiff's property. Hopkins testified he had begun the investigation in 2011 by examining the basement, the site of the known fuel-oil spill, noting sampling conducted there revealed both "shallow contamination right below the floor," followed by "a clean zone," followed by a second layer of contamination which, Hopkins believed, indicated a potential second source of contamination.

Hopkins explained his use of "a photoionization detector" (PID), "one of the field screening tools" used in his testing regimen, which he testified "gives you a relative read out of the concentration of the type of [sic] contaminants that you're targeting." He explained that the PID, combined with a "visual" examination and consideration of "odors," constituted "basically the tools you use for field screening."

Hopkins further explained that in 2016, he conducted the next phase of testing, beginning with a "geophysical survey" to determine if there were any other unknown storage tanks that were, or had been, located on the property as

other documentation had suggested might be the case. Without detailing the methodology supporting the survey, Hopkins explained that the survey "showed that there was an anomaly indicative of" a UST that was "approximately 1,000 gallons in size." He explained that at "about that same time" he had become aware of a photograph showing gasoline dispensers had been on the property and documents reflecting the presence and removal of two 550-gallon tanks belonging to Gulf, in addition to the installation of a 1,000-gallon tank.

Hopkins further explained that based on that information, he had selected the locations on the property to investigate next "to find out if there had been a separate release of gasoline and at the same time doing further evaluation of the fuel oil." He testified that he had installed three testing wells around the suspected UST, and groundwater samples from each were "screened . . . with PID, odor, visual" and "showed field indications of petroleum release."

According to Hopkins, two of the three wells showed "readings" of contamination at a depth consistent with the estimated base of the 1,000-gallon UST. Hopkins testified that "if there was going to be a release from that tank, you would have expected it where we started to see field readings." Referring to chemical analyses performed by outside labs, Hopkins testified that soil samples taken at the same sites "didn't show any concentrations that exceeded

the New Jersey remediation standards" but cautioned that "a lot of times with historic odor releases [sic], you can get significant field indications of a release and . . . it doesn't show up as targeted compounds that have lab results that are over the soil remediation standards."

Hopkins also testified concerning the results of groundwater samples collected at the site and tested by outside labs. Based on his review of the results of those tests, field screenings, and historical data, Hopkins reasoned "that there's evidence here that shows that there was a gasoline release." He explained that the lab's detection of "cyclohexane was one of the keys" found in one well close to the UST. Plaintiff's counsel asked whether cyclohexane would be "more plentiful in gasoline versus heating oil," but the court sustained Chevron's objection to that question based on a lack of foundation.

In response to questions posed by the court, Hopkins testified that the "main" chemicals that were usually more present in gasoline than in fuel oils were "BTEX," a group composed of benzene, toluene, ethylbenzene, and xylenes. He testified that he knew about BTEX from "various literature," but he could not "cite one in particular" and explained it was "an accepted rule or fact" among LSRPs that he knew. Hopkins did not know if NJDEP publications or regulations shed light on the question, but he believed that "many

documents," like "text books" and "[m]anufacturers' breakdowns" would reflect the same information. He was, however, unaware of any publication setting a threshold for BTEX concentration that supported a benchmark for differentiating gasoline from fuel oil or other petroleum products in a sample.

When plaintiff's counsel asked Hopkins if there were any "other chemicals that may be more plentiful in gasoline than fuel oil," defense counsel objected. The court overruled the objection, saying: "I'm going to allow sort of like the inverted foundation to be done. . . . He can say what he believes and then the basis for that." Defense counsel raised similar objections as Hopkins discussed different chemicals, and the court overruled them.

Hopkins testified that xylene and ethylbenzene present in the soil samples taken close to the 1,000-gallon UST. Xylene was also present in the water sample from the same location, but benzene was not detected in that sample. Hopkins explained that, of the BTEX chemicals, "benzene is . . . the most degradable. And the xylenes tend to stick around the longest." "Total lead," which Hopkins testified was used in pre-1980s gasoline, but not in fuel oils, was also present "pretty much across the site."

Hopkins also testified that chemicals in the "total volatile" or "tentatively identified compounds" (TICs) family were also present in "elevated

concentrations." He explained that the heavier of the "semi-volatile" compounds were not usually present in gasoline but would be present in fuel oils, meaning the TIC profile would be different for each contaminant. He did not, however, testify as to whether heavier or lighter TICs were present. He later testified that samples taken near the UST contained "alkanes," apparently a type of TIC, but the sample collected near the known fuel-oil spill did not. He testified that alkanes were "known constituents of gasoline," contributing to his conclusion that gasoline contamination was likely. During his testimony, Hopkins also emphasized that a sample taken "up gradient" of the UST contained only "219 parts per billion" of alkanes, whereas one "down gradient" contained "409,000 parts per billion."

Hopkins testified that he had compared the water samples collected from one sampling site, "which [he] knew from the forensics . . . was fuel oil," with samples from a site closer to the UST. He observed that the xylene concentration was four-to-five times higher in the latter samples, suggesting to him that gasoline was the contaminant. Nonetheless, Hopkins testified that, in his view, additional investigation was required on the site. Based on his field screenings and the lab analyses, Hopkins's testified there were "multiple contaminates at

the site," but "the investigation is not done because . . . the extent of the contamination is not delineated."

On cross-examination, Hopkins agreed that BTEX chemicals were found in fuel oil as well as gasoline and that he was unaware of any specific studies distinguishing dispersed BTEX from different contaminants. He also testified that the process of distinguishing petroleum contaminants based on BTEX had no formalized testing standards or, as far as he was aware, a known error rate. He agreed that BTEX degraded over time, meaning that older samples would have lower BTEX levels than fresh samples of the same substance. Hopkins further acknowledged he was unaware of any way to differentiate between a fresh sample which was low in BTEX naturally and an aged sample which was low in BTEX due to degradation. In any event, Hopkins testified he did not calculate the relative "volume percentage" of any BTEX found on the property. He further agreed that the specific BTEX components found in the basement of the general store where the fuel oil had failed were the same ones found elsewhere on the property.

Hopkins also testified his soil boring conducted near the putative UST did not show PID evidence of contamination until depths of at least ten feet, which was at or below the level of groundwater, which had been impacted by fuel oil

contamination. He also agreed that the PID test would not "necessarily" identify a contaminant and could not "tell you we have gasoline, fuel oil," or another contaminant.

Hopkins further acknowledged that, as an LSRP, he often relied on other specialized professionals to assist in his investigations, and identification of a contaminant based on a sample of the product itself was not within his expertise. He explained, however, that he was "more versed in looking at dissolve[-]phase contamination and determining what kind of release it was." He conceded that he could not identify a "specific document" that discussed the foundation of what defense counsel called the "dissolve[-]phase theory of looking at the constituents and then reaching a conclusion about the type of petroleum product."

Hopkins also testified that NJDEP guidelines called for testing for certain chemicals—2-methylnaphthalene and naphthalene—in the event that initial tests showed extractable petroleum hydrocarbons (EPH) in excess of twenty-five percent. Here, however, he tested for EPHs only in the basement samples and could not recall whether 2-methylnaphthalene and naphthalene testing had been performed. Conversely, he testified laboratory testing had been conducted for 1,2-dibromoethane and 1,2-dichloromethane, also called "lead scavengers," that

NJDEP identifies as markers for leaded gasoline, and the test results were negative for each. Hopkins also agreed the presence of "total lead" could have been present in the absence of a gasoline discharge because leaded gasoline would contain certain types of "organic leads," but he had not conducted an organic-lead test for the basement sample and none of the other samples taken from the property had been tested for organic lead.

Hopkins also testified the UST had not been tested for "tightness" or leaks, its contents had not been examined, and no expert had looked at it to determine if it had any signs of corrosion. Hopkins also had not performed calculations to determine ground-water velocity, a necessary datum to model contaminant movement.

As noted, Chevron presented Dr. Lifrieri as its witness, who first explained his educational background, including his bachelor's degree in geology and civil engineering, his master's degree in geotechnical engineering, and his doctoral degree in geo-environmental engineering, "which includes, hydrogeology, landfill engineering, [and] pollution." He was a "licensed engineer" in New Jersey and has "over [twenty-three] professional engineering licenses in various states," "four professional geology licenses in four States," and "a national certification as a . . . professional geologist." He also has held

certifications in the following areas related to unregulated underground storage tanks: installation; testing; closing; subsurface evaluation; and corrosion evaluation. He is not an LSRP qualified to deal with regulated tanks, but he has supervised and taught LSRPs in the past.

Dr. Lifrieri has taught various geology and environment college courses, worked for fifty-two years in the environmental and geotechnical departments of engineering firms, and has been involved many remediation projects and obtained NJDEP validation of remediation at "a lot" of contaminated sites. For the ten-years prior to the N.J.R.E. 104 hearing, Dr. Lifrieri exclusively focused his work on "environmental forensics"; that is, "determining the case and source of contamination at sites," and investigating "cause and origin . . . to determine what the pollutant is, where it's coming from, where it's going."

He testified that gasoline, fuel oil, and other petroleum products share many of the same component chemicals because "gasoline and fuel oil come from the same parent[:] crude oil," and he confirmed that the BTEX chemicals, as well as "cyclohexanes," "alkanes," and "methylcyclohexanes," would be present in both gasoline and fuel oil, citing a 1987 NJDEP study to that effect.⁴

⁴ The court admitted the study report in evidence, and testimony about it, over plaintiff's objection but ruled the report and testimony could and would be used only as relevant to a determination of Hopkins's qualifications and methodology.

He also testified "the standard operating procedure for the profession" when differentiating between petroleum products was to "review chromatographs to determine . . . what types of material [are] in the sample." He explained that the chromatography process involved vaporizing the sample and that "gasoline products typically elute, which is the same as vaporize, at lower time intervals, meaning lower temperatures," whereas the constituents of fuel oil "elute at a higher time interval."

He further explained that chromatographs are calibrated before use and that the methods of reading their results are subject to standardization and scientific study. Lifrieri opined that chromatography was "the only technique that you can use that will give you a definitive type of material" when differentiating between petroleum products and that, without a chromatograph, one could not identify a petroleum product when multiple sources are possible. He identified texts relied upon in the field that likewise identified "the need for using chromatograms to get a definitive evaluation of the material that exists in a sample." Lifrieri disagreed with Hopkins's and Torkelson's testimony about the feasibility of performing chromatography on the samples taken at the site. He asserted that chromatography could be performed both on "sheen" water samples and soil samples.

Lifrieri also explained that to identify the source and disbursement of contamination across a site, a geologist must review "groundwater . . . flow," the existence of any "impervious layers" that would cause "a modification to the natural flow," and "the dispersion properties of the soil." Lifrieri testified that based on that data, accepted methodology allowed for the development of an equation to predict the distribution of a contaminant spill. He noted Hopkins had not performed that analysis and he disapproved of Hopkins's failure to sample "the intervening space between the bottom of the [underground] tank and the top of the groundwater table" for the purpose of determining whether contaminants from the UST had reached the groundwater.

Lifrieri also commented on Hopkins's reliance on the presence of total lead, explaining that NJDEP had changed its regulations in 2012 to eliminate the mandate to test for lead in groundwater. In Lifrieri's opinion, based on NJDEP's contemporaneous publications, the change in the regulations reflected NJDEP's belief there was "little evidence that lead from leaded gasoline can be analyzed for and found in groundwater," and NJDEP instead advised that lead scavengers were better markers for determining the presence of leaded gasoline.

Lifrieri also testified about Hopkins's failure to test the UST, identifying several ways in which the tank could have been tested for leakage. He testified

that as an engineer, if he thought the UST was the source of pollution, testing the tank would have been the first thing to do, including testing a sample of the tank's contents to determine the contaminant at issue. Lifrieri noted that Hopkins had not performed any tests of the UST.

At the conclusion of the hearing, the court reserved decision and invited the parties to submit briefs in lieu of closing arguments accompanied by excerpts from transcripts of the prior bench trial.

In a written opinion and order, the court determined that at the time of trial Hopkins was an expert "qualified to render opinions regarding identification of a contaminant at a property, as well as the source of that contamination." The court also found Hopkins's methodologies "were reliable" and "of a type reasonably relied upon by experts in the field of licensed site remediation professionals."

The court based its findings on its review of Hopkins's qualifications, including his LSRP licensure and experience investigating over 1,000 sites for contamination, of which eighty percent had involved petroleum contamination. The court also accepted Hopkins's testimony that "the methodologies" he had "employed . . . were those utilized consistently by LSRPs." The court further found that "[c]onsistent with the [NJDEP] Field Manual, [Hopkins] [had]

performed soil borings, installed [a] test well, and used field screening techniques[, all of] which [we]re methodologies specifically directed by the NJDEP's regulations, manuals and other guidance." The court explained that Hopkins had utilized olfactory, "observations, visual and a photoionization detector (techniques specifically provided for in the [NJDEP] Field Manual)."⁵

The court also found that when Hopkins located a "release deeper than the fuel oil spill," NJDEP regulations "directed" him to examine documentary and similar evidence to develop an explanation for the release, and that required an investigation, which, the court found, Hopkins had performed and had pointed to the 1,000-gallon UST. The court further explained "Hopkins [had] identified the location of the 1,000-gallon [UST] . . . resulting from a geophysical study" he had performed.

The court also found that Hopkins had "continued his investigation, consistent with the methodologies" promulgated by the NJDEP, by testing dissolved phase groundwater—a practice "specifically identified in the Tech Regulations and testified to by Mr. Hopkins as a reliable methodology employed by LSRPs." The court similarly recognized the performance of gas

⁵ The court used the term "all factor," which we read in context to have been intended to be "olfactory."

chromatography as consistent with NJDEP rules, as was the assessment of groundwater flow and its implications for the way in which contaminants dispersed.

The court recognized that the soil samples contained BTEX chemicals, as well as "elevated lead," and found that Hopkins's "consideration" of this information was "consistent with NJDEP Tech Regulations for leaded gasoline." It concluded that "[t]he methodology employed by Mr. Hopkins as a certified LSRP is and was consistent with the NJDEP [requirements]." The court explained:

Not only are the results of the certified laboratories and groundwater samples (chromatograms) an appropriate methodology to employ to identify gasoline and its source but it is just one tool to be utilized in a greater investigative methodology. As identified by Mr. Hopkins (and not contradicted by defense expert Lifrieri) an LSRP also looks at business records, field screening information, the geography of the site, type of soils and groundwater flow and velocity to identify the contaminant and source of contamination . . . The methodology employed by an LSRP, such as Mr. Hopkins, is, as he testified, supported by the expert consensus in the field. The very existence of the NJDEP Tech Regulations, Administrative Regulations, and Field Manual collectively are a "well-founded methodology."

The court characterized Lifrieri as claiming, "that only the results of laboratory testing can be utilized to identify the contaminant and therefore [are]

the only scientifically reliable methodology." The court reasoned that Lifrieri's claim "did little to weaken . . . Hopkins'[s] qualifications or to undercut the methodology that Mr. Hopkins employed," since "[i]f taken to its logical conclusion, [it] would serve to undermine the very existence of the LSRP licensing program . . . and rest all determinations for contaminated sites solely on the results of laboratory testing." The court accepted as reliable Hopkins's "much broader" approach.

Chevron appealed from the court's order, and later moved for summary disposition on the appeal and for a stay pending appeal. We denied both motions in July 2022.

II.

Cheron argues the remand court erred by finding Hopkins had been qualified as an expert at the time of trial to offer an opinion that gasoline, as opposed to some other petroleum product, was present on plaintiff's property. Chevron argues the remand court misapprehended our remand order and erred by focusing on whether Hopkins was generally qualified to investigate spills rather than on whether he was qualified to "distinguish between petroleum products based on the chemical constituents in dissolved phase samples." Chevron argues that at the remand hearing, plaintiff did not present evidence of

any qualifications other than those we had found inadequate in Dorrell II. See Dorrell II, slip op. at 35-36 (noting the trial judge had found Hopkins qualified to offer an opinion gasoline was present on the site based solely on his status as an LSRP).

"The admission or exclusion of expert testimony is committed to the sound discretion of the trial court." Townsend v. Pierre, 221 N.J. 36, 52 (2015). An appellate court generally "must apply an abuse of discretion standard to a trial court's determination, after a full Rule 104 hearing, to exclude expert testimony on unreliability grounds." In re Accutane Litig., 234 N.J. 340, 391 (2018). The Court observed that New Jersey has "continued to apply a pure abuse of discretion standard in civil matters concerning expert testimony." In re Accutane, 234 N.J. at 391 (citing Townsend, 221 N.J. at 52-53).

Under the abuse-of-discretion standard, a trial court's ruling should be reversed "only if it 'was so wide off the mark that a manifest denial of justice resulted.'" Rodriguez v. Wal-Mart Stores, Inc., 237 N.J. 36, 57 (2019) (quoting Griffin v. City of E. Orange, 225 N.J. 400, 413 (2016)). This deferential standard applies to the question of whether a witness possesses sufficient qualifications to testify as an expert. Ryan v. Renny, 203 N.J. 37, 50 (2010).

The admissibility of expert testimony is governed by N.J.R.E. 702, which provides: "[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify thereto in the form of an opinion or otherwise." "The party offering the expert testimony has the burden of proof to establish its admissibility." State v. Rosales, 202 N.J. 549, 562 (2010) (citing Hisenaj v. Kuehner, 194 N.J. 6, 15 (2008)).

Three criteria must be satisfied to permit admission of a putative expert's opinion testimony:

(1) the intended testimony must concern a subject matter that is beyond the ken of the average juror; (2) the field testified to must be at a state of the art such that an expert's testimony could be sufficiently reliable; and (3) the witness must have sufficient expertise to offer the intended testimony.

[In re Accutane, 234 N.J. at 348 (quoting State v. Kelly, 97 N.J. 178, 223 (1984)).]⁶

We construe these requirements "liberally in light of Rule 702's tilt in favor of the admissibility of expert testimony." State v. Ghigliotty, 463 N.J. Super. 355,

⁶ While In re Accutane was decided after the 2017 trial in this case, we have held that its strictures apply retroactively. Lanzo v. Cyprus Amax Minerals Co., 467 N.J. Super. 476, 504 (App. Div. 2021).

374 (App. Div. 2020) (quoting State v. Jenewicz, 193 N.J. Super. 440, 454 (2008)).

To satisfy the third criterion – whether the witness has sufficient expertise to offer the intended testimony – "an expert witness must possess the minimal technical training and knowledge essential to the expression of a meaningful and reliable opinion." State v. Frost, 242 N.J. Super. 601, 615 (App. Div. 1990) (citing Hake v. Manchester Twp., 98 N.J. 302, 314 (1985), and Thompson v. Merrell Dow Pharm., 229 N.J. Super. 230, 241 (App. Div. 1988)). This may include licensure in a particular profession "[w]hen the subject matter of the testimony falls distinctly within the province of [that] profession." Ibid. "[E]xpertise [also] may be acquired by occupational experience or by scientific study." Ibid.

The remand record supports the court's determination Hopkins possessed sufficient expertise to offer an admissible opinion concerning the contaminants found on the property and their cause. The evidence established that for many years Hopkins has been an LRSP and, as such, has been charged by virtue of his licensure with "independently oversee[ing] the cleanup of contaminated sites, ensuring that the process is conducted effectively and in compliance with New Jersey statutes and regulations." Magic Petroleum Corp. v. Exxon Mobil Corp.,

218 N.J. 390, 400 n.2 (2014); see also N.J.S.A. 58:10C-7 (describing statutory criteria for LSRP licensure). He also testified about his education, training, and extensive background in environmental testing and remediation, including "decades" of professional experience, and his evaluation of at least 1,000 thousand contamination sites, of which roughly eighty percent had involved petroleum releases. He further explained that in those cases, he was required to determine the identity of the contaminants present.

Hopkins also testified that distinguishing one petroleum product from another necessarily fell within the ambit of an LSRP's responsibility because of the regulatory framework underlying DEP's evaluation and cleanup requirements. He explained that certain petroleum contamination—for example, from heating oil spills—could be dealt with by a less qualified evaluator, while others required the involvement of an LSRP. He also explained that although he is not experienced in performing laboratory testing on contaminant samples, he is familiar with the procedures and is experienced in reading and interpreting the resulting constituent compound reports.

In our view, the record supports the court's conclusion that Hopkins had beyond the "minimal technical training and knowledge" to opine on the identity of the contaminants and their sources. Frost, 242 N.J. Super. at 615. We reject

Chevron's effort to frame the issue differently; it asserts an analysis of Hopkins's qualifications required a determination only as to whether he was qualified to distinguish between the petroleum products on the property "based on the chemical constituents in dissolved phase samples." Framing the issue in that narrow manner misdirects the proper focus from whether Hopkins was qualified to offer an opinion on the presence of gasoline at the site and its cause to whether his opinion is credible or based on a reliable methodology.

We also reject Chevron's contention that at the remand hearing "Hopkins simply reiterated his qualifications as an LSRP" that we found inadequate in Dorrell II. Slip op. at 35-36. To be sure, the remand court was presented with evidence concerning Hopkins's qualifications that was duplicative of the trial evidence, but our remand in Dorrell II was premised in no small part on the trial court's failure to issue clear rulings on Hopkins's qualifications. Id. at 34, 36-37. That is, we remanded in part for the court in the first instance to make appropriate findings concerning Hopkins's qualifications under N.J.R.E. 702. Additionally, in Dorrell II we noted LSRP licensure did not "necessarily" render him "qualified to identify gasoline," but the remand court appropriately considered evidence in addition to Hopkins's licensure to support its qualifications determination.

For the reasons we have stated, the record supports the court's determination Hopkins was qualified to testify as an expert about the presence of gasoline and the cause of its presence at plaintiff's property. And, as we explain, having determined the court did not err in finding Hopkins qualified, we separately consider whether his opinion testimony was properly admitted based on the record presented.

In sum, the record does not support Chevron's claim that the remand court abused its discretion by determining that Hopkins was qualified at the time of trial to offer an expert opinion as to the contaminants found at plaintiff's property and their causation. See In re Accutane, 234 N.J. at 391. To the contrary, the court's findings and determination are amply supported by the record and the applicable legal principles.

We next consider Chevron's claim the court abused its discretion by admitting Hopkins's trial testimony identifying gasoline as a contaminant at plaintiff's property. Chevron contends plaintiff failed to present evidence at the remand hearing establishing Hopkin's testimony was grounded in a scientifically-reliable methodology and his conclusion did not otherwise follow the facts.

Prior to addressing Chevron's claim, we note that our remand order was precisely focused on the reliability of the methodology employed by Hopkins to support his opinion that gasoline was a contaminant found at the property. Dorrell II, slip op. at 38-39. We explained that the trial record did "not disclose that the facts and methods [Hopkins's] used to identify gasoline, and attribute it to Gulf, were reliable." Id. at 37. We further observed that at trial Hopkins "described the basis for his opinion" gasoline was present, "including the presence of certain chemicals, the proximity of the 1,000 gallon UST, and the historic use of the site," but we determined that "Hopkins referred to no scientific sources or evidence demonstrating that his methodology was reliable; or that it was generally accepted within the field of environmental assessment and investigation." Ibid.

We focused on the reliability of Hopkins's methodology because there is otherwise no dispute there is contamination by a petroleum product on the property and there had been fuel-oil spills at the property as well as the sale of gasoline and the presence of USTs for gasoline on the property. Thus, to demonstrate that Chevron is liable under the Spill Act, plaintiff bore the burden of proving not only that there was a petroleum-based contamination on the property, but more particularly that there was gasoline contamination because

plaintiff does not claim that Chevron is responsible for any extant fuel-oil contamination. See Dorrell II, slip op. at 7 (noting "[t]he genuine factual issue on appeal pertains to the [trial] court's finding that [plaintiff's] property was also contaminated with gasoline from the 1,000-gallon UST").

We "apply an abuse of discretion standard to the trial court's determination, after a full Rule 104 hearing, to [admit] or exclude expert testimony based on unreliability grounds." In re Accutane, 234 N.J. at 391. In determining the admissibility of scientific expert testimony in a civil case, trial court's must utilize a "methodology-based test for reliability" similar to the standard set forth by the United States Supreme Court in Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993). Id. at 397.

Under the standard, the Court's

view of proper gatekeeping in a methodology-based approach to reliability for expert scientific testimony requires the proponent to demonstrate that the expert applies his or her scientifically recognized methodology in the way that others in the field practice the methodology. When a proponent does not demonstrate the soundness of a methodology, both in terms of its approach to reasoning and to its use of data, from the perspective of others within the relevant scientific community, the gatekeeper should exclude the proposed expert testimony on the basis that it is unreliable.

[Id. at 399-400.]

In its application of the standard, a trial court we must consider "whether an expert's reasoning or methodology underlying the testimony is scientifically valid" and "whether that reasoning or methodology properly can be applied to facts in issue." Id. at 397 (citing Daubert, 509 U.S. at 591, 594-95; Rubanick v. Witco Chem. Corp., 125 N.J. 421, 449 (1991)). The party advancing expert testimony must show that the proffered witness "applies his or her scientifically recognized methodology in the way that others in the field practice the methodology." Id. at 399-400.

To aid in the reliability analysis, the Court has provided several "pertinent" but "not dispositive or exhaustive" factors to be evaluated:

1) Whether the scientific theory can be, or at any time has been, tested;

2) Whether the scientific theory has been subjected to peer review and publication, noting that publication is one form of peer review but is not a "sine qua non";

3) Whether there is any known or potential rate of error and whether there exist any standards for maintaining or controlling the technique's operation; and

4) Whether there does exist a general acceptance in the scientific community about the scientific theory.

[Id. at 389 (citing Daubert, 509 U.S. at 594).]

We have recognized the importance of an expert's ability to identify the sources upon which he or she relies. In Suarez v. Egeland, 353 N.J. Super. 191, 200 (App. Div. 2002), an expert was asked whether "any scientific literature . . . would support his opinion" but "responded with only general and vague references to various articles." He listed journals but could not identify the individual titles or authors of studies supporting his conclusions. Ibid. Further, he "did not identify any scholarly literature which show[ed] the reliability of his purported expert opinion." Ibid. We concluded that the witness's "reliance upon unidentified articles by unidentified authors in various international journals did not provide any discernable foundation in scholarly literature for his opinion." Id. at 201.

More recently, and following the Court's decision in In re Accutane, we considered in Lanzo v. Cyprus Amax Minerals Co., 467 N.J. Super. 476, 508-13 (App. Div. 2021), the testimony of an expert witness who similarly failed to explain the scientific basis underlying his opinions. The witness identified an article, quoted from it, and "asserted that it supported his opinion, but he did not identify or explain any scientific evidence that formed the basis for the statement." Id. at 509. Another article the witness cited "did not report the results of a scientific study and was not peer-reviewed." Id. at 510. An

Environmental Protection Agency document upon which the witness purported to rely "provided no details of any studies underlying its assessment, and [the witness] did not discuss any." Ibid.

We determined the court had not "perform[ed] its required gatekeeping function and [had] mistakenly exercised its discretion," by permitting the witness to testify because the witness's opinion had "not been tested" in that there were "no studies" supported it, the theory on which the opinion was based had not "been subject to peer review and publication," and there was no showing the "theory was generally accepted in the scientific community." Id. at 511.

Here, Hopkins's methodology consisted of "identifying gasoline based on the chemical array in dissolved samples . . . premised on the greater percentage of benzene, toluene, ethylbenzene and xylene ('BTEX') in gasoline relative to other petroleum products." But the record lacks evidence supporting the reliability of that methodology. Indeed, Hopkins could not cite to a single scientific resource, article, journal, publication, test, or study supporting the reliability of that methodology, and he acknowledged he was unaware if there is any known error rate for the methodology he employed. For those reasons alone, plaintiff failed to carry her burden of establishing the reliability of Hopkins's methodology under the In re Accutane standard. 234 N.J. at 389; see also Lanzo, 467 N.J. Super. at 509-11.

More particularly, as part of his methodology, Hopkins relied on the premise that cyclohexane, BTEX, and "total" lead are present in higher concentrations in gasoline than in other petroleum products. Hopkins asserted that cyclohexane is a "key" marker for gasoline but provided no source for that assertion and was unable to testify whether it was more plentiful in gasoline than in fuel oil or other contaminants. Similarly, Hopkins testified that BTEX was the "main" group of chemicals he had found in various samples and upon which he relied in support for his opinion there was gasoline contamination, but he could not identify any publications, texts, or scientific literature that supported his conclusion, instead offering nothing more than a conclusory assertion that "various literature" supported the claim. That is not enough. Lanzo, 467 N.J. Super. 510.

Hopkins also testified that gasoline would contain more BTEX than other petroleum products, but he could not testify as to how much BTEX would be found in either gasoline or fuel oil and he could not identify any formal, scientifically vetted standards permitting a conclusion about a contaminant substance based on BTEX. Hopkins also opined about purported differences in the TIC and alkane composition of fuel oil and gasoline but provided no source or scientific supporting his analysis or characterization.

Hopkins's opinion concerning the presence of gasoline was also based on the premise that a contaminant's composition can be accurately derived from the samplings he performed and the testing he ordered. Although he referred to NJDEP materials to support the premise, and they called for the use of dissolved phase testing, Hopkins could not identify a "specific document" that described or validated the practice of testing such dissolved samples by looking at the constituents and then reaching a conclusion about the type of petroleum product present based on them. Stated differently, he could not and did not offer any scientific data establishing it is possible to calculate the relative volume of specific chemicals in a pollutant from a diffuse environmental sample, a calculation that is critical to the relative-composition methodology on which he relied. See Dorrell II, slip op. at 35 (explaining "an essential element of [Hopkins's] opinion that the contaminate was gasoline rested on [his] analysis of various chemicals"). In sum, Hopkins's effort to establish the reliability of his methodology fails for the same reasons we reversed the admission of the expert's testimony in Lanzo; Hopkins's was unable to identify a single recognized study or other established basis in science supporting the methodology and its various and critical components. 467 N.J. at 509-11.

Not only did Hopkins fail to establish the reliability of his methodology under the In re Accutane standard, the evidence otherwise undermined the reliability of the methodology. More particularly, the evidence established Hopkins had failed to consider that: BTEX chemicals degrade over time, but at different (unspecified) rates; and constituent chemicals might travel through soil or groundwater at different rates. Hopkins did not testify as to what, if any, methodology he had employed to compensate for the multiple, potentially overlapping sources of contamination, and whether his methodology was reliable under such conditions.

Hopkins also testified that a specific kind of lead—organic lead—was contained in gasoline, but he had tested for organic lead only in the samples taken from the basement where the fuel spill occurred. He did not test for organic lead around the 1,000-gallon UST or elsewhere on the property, instead testing in those other locations for only "total lead," which Hopkins acknowledged is found in a number of non-gasoline petroleum sources. Additionally, according to Lifrieri's unrefuted testimony, based in part on NJDEP's 2012 publications accompanying its change in sampling protocols to eliminate total lead testing, there is "little evidence that lead from leaded gasoline can be analyzed for and found in groundwater."

Further, Hopkins testified he did not calculate the relative "volume percentage" of BTEX in any sample from the property. Thus, even if he had been aware of a numerical threshold distinguishing gasoline from fuel oil based on BTEX volume percentage, and dissolved phase testing could theoretically be used to calculate the relative amount of BTEX in an original contaminant, he did not use that methodology here. Thus, although Hopkins's data shows the environmental concentration of BTEX in the samples, he offered no scientifically established methodology permitting a determination based on that data that the contaminant was gasoline rather than some other BTEX-containing petroleum product. The same analysis and issues undermine the reliability of his analysis of cyclohexane. Similarly, Hopkins explained that "total lead" can be attributed to any number of sources and was found "pretty much across the site." And, although the evidence established that "lead scavengers" demonstrate the presence of leaded gasoline, Hopkins did not test for "lead scavengers" at all.

Another issue undermining the reliability of Hopkins's methodology pertains to the distribution of chemicals and the asserted source of contamination. Hopkins did not explain why or how the chemicals found are not distributed uniformly over the property if the BTEX, cyclohexane, and lead

contamination were derived from gasoline contamination from the single place he had identified as their source – the location of the 1,000-gallon UST. For example, in groundwater testing, the highest benzene and lead levels were found at testing-well TW-8, on the north end of the property; the highest toluene, ethylbenzene, and xylene levels were found at testing-well TW-10, on the eastern border of the property; the highest cyclohexane level was found at testing well TW-4, closest to the tank. It is unclear from the record how, if the chemicals shared a source, they would have dispersed unevenly and, if that source was the UST, why the highest concentrations of all chemicals were not closest to it.

This unexplained ambiguity is compounded by the dearth of testing of the tank itself. The tank was not excavated or tested for tightness, and no samples were taken from its interior. Hopkins also offered no testimony concerning the reliability of the methodology he had utilized during the geophysical survey to support his conclusion there was a 1,000-gallon UST located on the property. Moreover, although Hopkins's opinion is premised on the relative volume of certain chemicals which he testified would be present in different petroleum products, he did not calculate—or even estimate—the relative volume of those chemicals in the samples he had obtained.

The record also includes evidence there were several available and reliable tests and investigative techniques Hopkins failed to employ. More particularly, Hopkins failed to: "retain corrosion experts" to gauge the likelihood of a leak in the 1,000-gallon tank; test the tank for tightness or use "tracer compounds" to discover leakage; determine "ground water velocity" or "groundwater modeling" to identify the origin and trajectory of contaminants. Moreover, Hopkins's professed reason for relying on his methodology instead of hydrocarbon fingerprinting/chromatography—that "hydrocarbon fingerprinting cannot be performed on samples dissolved in water"—is wholly unsupported by any scientifically-based authority in the record. Hopkins's failure to apply widely accepted methods of testing further undermines the reliability of his methodology. Cf. Bahrle v. Exxon Corp., 279 N.J. 5, 33-34 (App. Div. 1995) (explaining expert opinion properly barred where there was no evidence expert's methodology had been used by others and where otherwise reliable methodology was not used), aff'd, 145 N.J. 144 (1996).

The inadequacies of the proofs supporting the reliability of Hopkins's methodology are largely those we identified in Dorrell II. We took issue with the fact that "Hopkins referred to no scientific sources or evidence to demonstrate that his methodology was reliable; or that it was generally accepted

within the field" as a way to draw his conclusions from the data. Slip op. at 37. The lack of such evidence was confirmed before the remand court. We had also observed that "other reliable methods of identifying gasoline and determining its source," like testing for organic lead and lead scavengers, examining the 1,000-gallon tank, or performing chromatograms,⁷ existed, but the remand record simply confirms that "Hopkins chose not to use" them. Id. at 37.

Based on those circumstances and evidence, we are persuaded plaintiff did not demonstrate that Hopkins's methodology was sufficiently reliable under the In re Accutane standard to support his opinion that gasoline was a contaminant present on the plaintiff's property. 234 N.J. at 349, 397. In short, the remand record is bereft of any evidence the essential element and critical theory underlying Hopkins's methodology—that dissolved phase testing of groundwater could reliably distinguish one petroleum product from another—has been "tested," was "subject to peer review and publication," has a "known or potential error rate," or was generally accepted "in the scientific community." Id. at 389. As in Suarez, 353 N.J. Super at 200, and Lanzo, 467 N.J. Super at

⁷ Referring to Torkelson's testimony from the initial trial, plaintiff contends that chromatograms cannot be performed when a contaminant is fully dissolved in water. Defendant's expert disagreed. It is unnecessary to resolve the dispute because the impracticability of one accepted method of testing would not render reliable an otherwise unreliable methodology.

509-12, Hopkins supported the scientific validity of this methodology by vague references to unidentified literature, but he could not identify any studies or other scientific support establishing the reliability of his methodology. As our Supreme Court warned in In re Accutane, an opinion which is "connected to existing data only by the ipse dixit of the expert" does not satisfy the requirements of our evidentiary rules, 234 N.J. at 385, and that is what Hopkins's offered here.

We are not persuaded by the remand's court's reliance on the various NJDEP publications and guidance because, in our view, the fact that Hopkins may have followed required protocols and followed recommended procedures in collecting the samples, engaging in other investigative methods, and testing the samples does not establish that the methodology on which his opinion gasoline is present rests, formed as a result of those actions, is scientifically reliable. And, for the reasons we have explained, plaintiff simply, but fatally, failed to present sufficient evidence the methodology satisfied the standard for reliability under the In re Accutane standard after having been provided the opportunity to do so in our opinion in Dorrell II. Slip. op. at 39.

A court abuses its discretion "when a decision is made without a rational explanation, inexplicably departed from established policies, or rested on an

impermissible basis." Kornbleuth v. Westover, 241 N.J. 289, 302 (2020). Here, for the reasons we have explained, we conclude the court abused its discretion by concluding plaintiff had sustained her burden of establishing the reliability of Hopkins's methodology. A proper application of the In re Accutane standard to the facts does not support the court's determination.

As we explained in Dorrell II, if the remand court had found Hopkins's methodology was unreliable, it should have vacated the judgment against Chevron. Slip. op. at 39. Having concluded that the remand court abused its discretion by finding Hopkin's testimony there was gasoline contamination at the property was based on a reliable methodology, we therefore reverse the remand court's order and remand for vacatur of the judgment against Chevron.⁸ See ibid.

Reversed and remanded for further proceedings in accordance with this opinion. We do not retain jurisdiction.

I hereby certify that the foregoing
is a true copy of the original on
file in my office.


CLERK OF THE APPELLATE DIVISION

⁸ Given our disposition of the reliability issue, it is unnecessary to address Chevron's argument that Hopkins's testimony constituted an inadmissible net opinion.