

IN THE SUPREME COURT OF TEXAS

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No. 04-1118
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CITY OF SAN ANTONIO, PETITIONER,

v.

CHARLES POLLOCK AND TRACY POLLOCK,
INDIVIDUALLY AND AS NEXT FRIENDS OF
SARAH JANE POLLOCK, A MINOR CHILD, RESPONDENTS

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ON PETITION FOR REVIEW FROM THE
COURT OF APPEALS FOR THE FOURTH DISTRICT OF TEXAS
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Argued October 18, 2006

JUSTICE HECHT delivered the opinion of the Court, in which CHIEF JUSTICE JEFFERSON, JUSTICE WAINWRIGHT, JUSTICE JOHNSON and JUSTICE WILLETT joined, and in all but Part II-C of which JUSTICE BRISTER joined.

JUSTICE MEDINA filed a dissenting opinion, in which JUSTICE O'NEILL joined.

JUSTICE GREEN did not participate in the decision.

When the government maintains a public nuisance that it knows is substantially certain to cause a specific injury to private property, it may be required by article I, section 17 of the Texas

Constitution¹ to provide adequate compensation for taking or damaging the property.² The claim in this case is that benzene from a closed municipal waste disposal site migrated through the soil to a nearby home, reducing its value and causing the owners' minor daughter to contract leukemia. We hold that there is no evidence the city knew its actions were substantially certain to cause the asserted injuries or that the personal injuries were caused by exposure to benzene. Accordingly, we reverse the judgment of the court of appeals³ and render judgment for petitioner.

I

Charles and Tracy Pollock's daughter Sarah was born in June 1994. In February 1998, she was diagnosed with acute lymphoblastic leukemia ("ALL"). Cancer is rare in children, but leukemia is the most common, and ALL is the most common type of childhood leukemia.⁴ A bone marrow biopsy also found that sixty percent of Sarah's bone marrow cells had 56 to 58 chromosomes instead

¹ TEX. CONST. art. I, § 17 ("No person's property shall be taken, damaged or destroyed for or applied to public use without adequate compensation being made . . .").

² *City of Dallas v. Jennings*, 142 S.W.3d 310, 314, 316 (Tex. 2004) ("We . . . hold that when a governmental entity physically damages private property in order to confer a public benefit, that entity may be liable under Article I, Section 17 if it (1) knows that a specific act is causing identifiable harm; or (2) knows that the specific property damage is substantially certain to result from an authorized government action — that is, that the damage is necessarily an incident to, or necessarily a consequential result of the government's action. . . . [A] city may be held liable for a nuisance that rises to the level of a constitutional taking." (internal quotation marks omitted)).

³ 155 S.W.3d 322 (Tex. App.—San Antonio 2004).

⁴ Acute lymphoblastic leukemia is also called acute lymphocystic leukemia. The American Cancer Society reported in its publication, *CANCER FACTS AND FIGURES 2000*, at 19 (2000), *available at* <http://www.cancer.org/downloads/STT/F&F00.pdf> (last visited Nov. 20, 2008): "Leukemia is the most common form of cancer in childhood, affecting approximately 2,600 children under age 15 in the United States each year. Leukemia accounts for about one-third of all cancers in children under age 15 and about one-fourth of all cancers occurring before age 20. Acute lymphoblastic leukemia (ALL) constitutes approximately three-fourths of all childhood leukemias. The peak occurrence of ALL is between ages 2 and 3, with rates slightly higher among whites and males. Five-year relative survival from ALL has greatly increased over time, and is now nearly 80%, primarily due to several improvements in treatment."

of the expected 23 pairs; there were trisomies, a tetrasomy, and a translocation.⁵ Following an intensive regimen of chemotherapy lasting more than two years, the cancer went into remission and the chromosomal anomalies disappeared. The statistical chance of recurrence is twenty percent.⁶

After Sarah began treatment, the Pollocks decided their family had outgrown the home in which they had been living in San Antonio since January 1992, before Sarah and her younger sister were born, and they put it up for sale. The home backed up to an old limestone quarry the City had used as a waste disposal site from 1967 to 1972 called the West Avenue landfill. The landfill had been closed and covered over with several feet of dirt twenty years before the Pollocks bought their home, but they had always smelled what Tracy described as “a really strong, pungent odor” in the house, particularly in the bathrooms. They smelled the same odor in the back yard for several days after a rain.

The Pollocks’ realtor, wanting to fully disclose the condition of the property to prospective buyers, obtained an April 1998 report prepared for the City on methane gas concentrations around the landfill and gave it to the Pollocks. Anaerobic bacteria digesting landfill waste can produce large quantities of methane. Methane, the principal component of natural gas, is a colorless, odorless gas

⁵ Normally, each of the 23 pairs of human chromosome consists of two copies of a linear strand of DNA material, one from the father and one from the mother, joined together at a point along their lengths called the centromere in a four-armed shape. A trisomy has three strands instead of a pair, and a tetrasomy has four. In 60% of Sarah’s bone marrow cells there were nine trisomies — at pairs 4, 6, 8, 9, 10, 14, 17, 18, and 23 — and a tetrasomy — at pair 21. A translocation occurs when part of a chromosome is missing and attached instead to another chromosome. Sarah had a portion of chromosome pair 1 translocated to chromosome pair 22.

⁶ Sarah also faces an increased risk of developing a secondary cancer as a result of her chemotherapy regimen.

at room temperature and standard pressure.⁷ It has a lower explosive limit of 5% and an upper explosive limit of 15%, which means that it is explosive at a concentration of between 5% and 15% in air. Though not toxic, it can cause asphyxiation at a concentration above 14% in air. Bacterial production of methane increases when leachate is present. Leachate is water that has seeped down into a landfill and percolated through it, collecting various contaminants along the way. Methane can serve as a carrier for other landfill byproducts and volatile organic compounds, such as benzene. Benzene is an aromatic hydrocarbon found in crude oil. At room temperature and standard pressure, benzene is a clear liquid with a sweet smell, but it evaporates quickly and is highly flammable. It is widely used as a gasoline additive, an industrial solvent, and a precursor in the production of other chemicals, and is present in cigarette smoke. Benzene is a known carcinogen.

Attached to the report the realtor obtained was an analysis of gas samples taken at the landfill, reflecting that small traces of benzene had been detected — 13.3 ppb in one sample and 146 ppb in another.⁸ Tracy showed the report to one of Sarah’s oncologists, Dr. Kenneth Lazarus, who became alarmed and warned her to keep her children out of the back yard. The Pollocks immediately moved out of their home and sold it a few months later for \$75,000. (They had paid \$77,000 for it seven years earlier and were asking \$94,000.) In January 2000, the Pollocks sued the City, claiming

⁷ As a consumer safety measure, a foul-smelling odorant, usually methanethiol or ethanethiol, is added to natural gas sold for fuel.

⁸ The Texas Commission on Environmental Quality gives these examples to illustrate “ppb” — parts per billion: 1 penny in 10 million dollars; 1 second in 32 years; 1 foot of a trip to the moon; 1 blade of grass on a football field; 1 drop of water in an Olympic-size swimming pool. See http://www.tceq.state.tx.us/assets/public/remediation/superfund/jonesroad/ppb_chart.pdf (last visited Nov. 20, 2008).

that Sarah's ALL was caused by Tracy's exposure to benzene from the West Avenue landfill during her pregnancy.

The evidence revealed that several years after the City closed the landfill in 1972, it began receiving complaints from nearby residents about odors caused by gases escaping from the landfill. In 1980, the City found that pockets of methane gas had formed near the landfill, some in potentially explosive concentrations. The highest observed concentrations were along the southwest side of the landfill, in the neighborhood where the home the Pollocks later bought was located. To collect methane from the landfill and prevent its migration into the surrounding area, the City drilled a system of ventilation wells around the perimeter, connected by a pipe, with a compressor to lower the pressure so that gas would be drawn from the landfill into the wells. The City also purchased two residences near the landfill in which gas had been detected, one just two blocks from the Pollocks' property, to use as monitoring facilities.

In 1982, a survey of the water quality in several wells in the Edwards Aquifer detected various volatile organic compounds, including benzene, which might have come from the landfill. A consulting firm hired by the City concluded that methane was migrating through subsurface cracks in the walls and base of the landfill. Once outside the landfill, methane could also flow through the soil along trenches that had been dug to lay residential utilities, like water and sewer lines, and refilled. In that way, methane carrying benzene and other chemicals could migrate to the houses surrounding the landfill, endangering residents. The consultants also concluded that leachate had accumulated in the landfill, increasing methane production and blocking it from reaching the

ventilation wells. The consultants recommended that the methane collection system be improved and wells drilled to remove leachate from the landfill.

The City made several improvements in 1985, but subsidence in the landfill continued to impair operation of the methane collection system and the leachate collection wells, causing portions of the system to collapse. Subsidence also allowed water to pool at the surface, increasing drainage through the landfill and the amount of leachate, which in turn increased methane production. When the Pollocks bought their home, there was a large hole in the back yard, apparently due to subsidence near the landfill. At the Pollocks' request, the City filled the hole, but it developed again later, and the City filled it a second time.

In late 1989, a City engineer recommended major repairs to the methane collection system, and in August 1994, an outside contractor hired by the City recommended that the entire system be replaced. The City installed a new system in early 1998.

Over the years, the City regularly tested for landfill gas in the ventilation wells and at several homes near the landfill, including those used as monitoring facilities. The air near the Pollocks' home was field-tested for methane at various times between 1981 and 1997, using a hand-held explosimeter. No methane was detected near the Pollocks' home while they lived there. At trial, the Pollocks' expert, Dan Kraft, an engineer with experience in landfill management, attempted to extrapolate the presence of landfill gas on the Pollocks' property in 1993 and 1994, when Tracy was pregnant with Sarah, from samples taken in 1998 from a sealed monitoring well 128 feet deep, located 30 feet from the Pollocks' back yard and 70 feet from their home. Those samples contained methane at a concentration of 477,000 ppm (47.7%) and benzene at 146 ppb by volume. Assuming

that the ratio of benzene to methane remained constant over time while methane from the landfill was decreasing — an assumption the City agreed was reasonable — and using an accepted EPA gas generation model, Kraft concluded that, had a sample from the sealed well been taken in 1993-1994, it would have contained at least 160 ppb benzene. Kraft then stated that in his opinion, gas with a composition similar to the sample entered the Pollocks' home "on a regular basis". Of course, landfill gas would immediately dissipate in the open air.⁹ Even greatly diluted, the gas would have been asphyxiating and explosive. Kraft offered no opinion regarding any concentrations of methane or benzene in the ambient air in the Pollocks' home and yard.

Dr. Mahendar Patel, Sarah's other treating oncologist, testified that in his opinion, Sarah's leukemia was caused by Tracy's exposure to benzene while she was pregnant with Sarah. Patel was experienced in diagnosing and treating ALL but had done no research himself on the causes of the disease or any connection between ALL and benzene. He based his opinion at trial on Kraft's testimony and on several studies of cancer rates in workers occupationally exposed to benzene. None of the studies considered an exposure to benzene at a concentration less than 31 ppm, which is 31,000 ppb, over 200 times the concentration in the 1998 sample on which Kraft relied. The studies also found chromosomal anomalies in subjects, some of which were similar to Sarah's, but the studies did not conclude that exposure to benzene was the most likely cause of anomalies like Sarah's.

⁹ Methane is much lighter than air (0.55 specific gravity at standard temperature and pressure). Benzene vapor, though heavier than air, is volatile and dissipates rapidly in air. AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, U.S. DEPT. OF HEALTH & HUMAN SERVS., HEALTH CONSULTATION: REVIEW OF ON-SITE AIR MONITORING DATA DURING THE REMOVAL AT LE MARS COAL GAS SITE 7 (2005).

Garbage removal and disposal is a governmental function¹⁰ for which the City is immune from liability, but the Pollocks contend that governmental immunity does not bar their recovery for nuisance and negligence. Article I, section 17 of the Texas Constitution requires compensation for a nuisance that amounts to a taking of property,¹¹ and the Texas Tort Claims Act waives immunity for governmental negligence in some circumstances.¹² The jury found that:

- the landfill was a nuisance;
- the City was negligent;
- the City acted with malice;
- actual damages caused by the nuisance and the negligence were:
 - \$7 million for Sarah’s past and future physical pain and mental anguish, disfigurement, and physical impairment;
 - \$111,000 for past medical care; and
 - \$6 million for future medical care;
- property damages caused by the nuisance was \$29,000; and
- \$10 million exemplary damages should be assessed against the City.

The Pollocks elected to recover on their nuisance claim. The trial court reduced the award for future medical expenses to \$500,000 and otherwise rendered judgment on the verdict, plus prejudgment

¹⁰ TEX. CIV. PRAC. & REM. CODE § 101.0215(a)(6).

¹¹ TEX. CONST. art. I, § 17.

¹² TEX. CIV. PRAC. & REM. CODE § 101.021.

interest and costs, for a total of \$19,999,223.78. On appeal by the City, the court of appeals reversed the exemplary damage award and affirmed in all other respects.¹³

We granted the City's petition for review.¹⁴

II

A

The Pollocks rest their claim that Sarah's ALL was caused by *in utero* exposure to benzene from the West Avenue landfill on the opinions of their experts, Kraft and Patel. The City contends that the expert testimony was conclusory and therefore legally insufficient to support a judgment. The City raised this objection repeatedly in the trial court, in motions for directed verdict after the Pollocks rested their case and again at the close of the evidence, and by post-trial motions for judgment non obstante veredicto and for new trial. But the City did not object to the admission of the evidence.

Bare, baseless opinions will not support a judgment even if there is no objection to their admission in evidence. In *Coastal Transportation Co. v. Crown Central Petroleum Corp.*, we summarized settled law as follows:

[A]lthough expert opinion testimony often provides valuable evidence in a case, "it is the basis of the witness's opinion, and not the witness's qualifications or his bare opinions alone, that can settle an issue as a matter of law; a claim will not stand or fall on the mere *ipse dixit* of a credentialed witness." *Burrow v. Arce*, 997 S.W.2d 229, 235 (Tex. 1999). Opinion testimony that is conclusory or speculative is not relevant evidence, because it does not tend to make the existence of a material fact "more probable or less probable." See TEX. R. EVID. 401. This Court has labeled

¹³ 155 S.W.3d 322 (Tex. App.—San Antonio 2004).

¹⁴ 49 Tex. Sup. Ct. J. 567 (May 5, 2006).

such testimony as “incompetent evidence,” and has often held that such conclusory testimony cannot support a judgment. *Cas. Underwriters v. Rhone*, 134 Tex. 50, 132 S.W.2d 97, 99 (1939) (holding that a witness’s statements were “but bare conclusions and therefore incompetent”); *see also Wadewitz v. Montgomery*, 951 S.W.2d 464, 466 (Tex. 1997) (“[A]n expert witness’s conclusory statement . . . will neither establish good faith at the summary judgment stage nor raise a fact issue to defeat summary judgment.”). Furthermore, this Court has held that such conclusory statements cannot support a judgment even when no objection was made to the statements at trial. *Dallas Ry. & Terminal Co. v. Gossett*, 156 Tex. 252, 294 S.W.2d 377, 380 (1956) (“It is well settled that the naked and unsupported opinion or conclusion of a witness does not constitute evidence of probative force and will not support a jury finding even when admitted without objection.”); *Rhone*, 132 S.W.2d at 99 (holding that “bare conclusions” did not “amount to any evidence at all,” and that “the fact that they were admitted without objection add[ed] nothing to their probative force”); *see also Merrell Dow Pharms., Inc. v. Havner*, 953 S.W.2d 706, 712 (Tex. 1997) (“When the expert ‘brings to court little more than his credentials and a subjective opinion,’ this is not evidence that would support a judgment If for some reason such testimony were admitted in a trial without objection, would a reviewing court be obliged to accept it as some evidence? The answer is no.”).¹⁵

We held that a party may complain that conclusory opinions are legally insufficient evidence to support a judgment even if the party did not object to the admission of the testimony.¹⁶

When a scientific opinion is not conclusory but the basis offered for it is unreliable, a party who objects may complain that the evidence is legally insufficient to support the judgment.¹⁷ An objection is required to give the proponent a fair opportunity to cure any deficit and thus prevent trial by ambush.¹⁸ As we explained in *Coastal*, there is

¹⁵ *Coastal Transp. Co. v. Crown Central Petrol. Corp.*, 136 S.W.3d 227, 232 (Tex. 2004) (footnote omitted).

¹⁶ *Id.* (“We disagree that an objection is needed to preserve a no-evidence challenge to conclusory expert testimony.”).

¹⁷ *Merrell Dow Pharms., Inc. v. Havner*, 953 S.W.2d 706, 711-712 (Tex. 1997).

¹⁸ *Maritime Overseas Corp. v. Ellis*, 971 S.W.2d 402, 409 (Tex. 1998) (“To preserve a complaint that scientific evidence is unreliable and thus, no evidence, a party must object to the evidence before trial or when the evidence is offered. Without requiring a timely objection to the reliability of the scientific evidence, the offering party is not given

a distinction between challenges to an expert's scientific methodology and no evidence challenges where, on the face of the record, the evidence lacked probative value. When the expert's underlying methodology is challenged, the court necessarily looks beyond what the expert said to evaluate the reliability of the expert's opinion. When the testimony is challenged as conclusory or speculative and therefore non-probative on its face, however, there is no need to go beyond the face of the record to test its reliability. We therefore conclude that when a reliability challenge requires the court to evaluate the underlying methodology, technique, or foundational data used by the expert, an objection must be timely made so that the trial court has the opportunity to conduct this analysis. However, when the challenge is restricted to the face of the record — for example, when expert testimony is speculative or conclusory on its face — then a party may challenge the legal sufficiency of the evidence even in the absence of any objection to its admissibility.¹⁹

In *Coastal*, the plaintiff contended that the defendant was grossly negligent in using a defective device to prevent overfilling gasoline tanker trucks, resulting in a spill and fire.²⁰ An expert's opinions that the defendant acted with conscious indifference were simple assertions with no basis at all, and we held that they were legally insufficient to support the judgment.²¹ But even when some basis is offered for an opinion, if that basis does not, on its face, support the opinion, the opinion is still conclusory. Our decision in *Volkswagen of America, Inc. v. Ramirez*²² is an example. There, the plaintiff's car bumped against another vehicle traveling the same direction, then crossed a 500-foot grassy median to the opposite side of the highway and hit a third car head-on.²³ The

an opportunity to cure any defect that may exist, and will be subject to trial and appeal by ambush.” (citations omitted).

¹⁹ *Coastal*, 136 S.W.3d at 233 (citations omitted).

²⁰ *Id.* at 230.

²¹ *Id.* at 231, 233.

²² 159 S.W.3d 897 (Tex. 2004).

²³ *Id.* at 901-902.

plaintiff's expert concluded that the rear wheel of the plaintiff's car came loose from the axle before the accident rather than after, and therefore caused, rather than was caused by, the accident.²⁴ The expert pointed to several facts to show that the wheel bearing failed and noted that after the accident, grass was found in the hub of the detached wheel.²⁵ But he could not explain how the wheel detached before the accident but nevertheless remained in the car's wheel well while the car crossed the median and collided with another car.²⁶ We concluded that, even assuming the expert's methodology was reliable (the defendant had not objected to it) and taking the record at face value, the facts on which he relied did not support his conclusion.²⁷

When a scientific opinion is admitted in evidence without objection, it may be considered probative evidence even if the basis for the opinion is unreliable. But if no basis for the opinion is offered, or the basis offered provides no support, the opinion is merely a conclusory statement and cannot be considered probative evidence, regardless of whether there is no objection. “[A] claim will not stand or fall on the mere *ipse dixit* of a credentialed witness.”²⁸ In the case before us, the Pollocks argue that the City's challenge to their experts' testimony is really a challenge to its reliability — to the data used and the experts' methodology. The City insists that it is not challenging the reliability of Kraft's and Patel's testimony, even conceding that it agrees with much

²⁴ *Id.* at 902.

²⁵ *Id.* at 911.

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Burrow v. Arce*, 997 S.W.2d 229, 235 (Tex. 1999).

of their methodology. Rather, the City contends that there is no basis in the record for the experts' ultimate opinions, and therefore they cannot support the judgment. We examine each expert in turn and conclude that there was no evidence to support an award of personal injury damages on the Pollocks' theories of nuisance or negligence.

B

Kraft's testimony was offered to prove that Sarah Pollock was exposed *in utero* to landfill gas at levels high enough to cause ALL. Landfill gas had never been found on the Pollocks' property from the time they lived there to the time of trial, but it had been found in other homes in the neighborhood, and it could have migrated to the Pollock's property along underground utility lines or through the ground generally. The Pollocks smelled odors in their home and back yard which might have been landfill gas, and subsidence in their back yard might have been due to underground leachate from the landfill. In 1998, gas in a sealed monitoring well 128 feet deep and 30 feet from the Pollocks' property tested 47.7% methane with 146 ppb benzene by volume. Using an EPA-approved gas model, Kraft extrapolated that in 1993-1994, gas in the well would have been more than 50% methane with 160 ppb benzene by volume. Based on this data and analysis, Kraft concluded: the Pollocks were exposed to gas levels like that in the sealed well. In other words, air on the Pollock's property would have been like that found in the sealed well.

The City does not challenge any part of Kraft's analysis except his final conclusion. The City does not quarrel with Kraft's decision to use 1998 gas samples taken from the monitoring well closest to the Pollocks' property, or with his assumptions that the benzene-to-methane ratio was constant over time while methane from the landfill was decreasing, or with his conclusion that

therefore the benzene concentration in the well between 1993 and 1994 would have been 160 ppb. The City does not dispute that methane migrated out of the landfill or that it was possible for methane to migrate onto surrounding property, including the Pollocks' property, through utility trenches or otherwise.

The City contends that none of these facts or analyses supports Kraft's conclusion that the Pollocks were exposed to benzene at a level of 160 ppb in the air in their home and on their property. Assuming from Kraft's data that in 1993-1994, gas in the monitoring well would have been 50% methane and 160 ppb benzene, and that gas of that composition migrated onto the Pollocks' property, it unquestionably dissipated in the ambient air. Unless the landfill gas was less than 28% of the ambient air — and the methane concentration reduced below 14%, with a benzene concentration of 44.8 ppb — the Pollocks would have suffocated *from the methane*. Unless gas like that found in the well were less than 10% of the ambient air — and the methane concentration reduced below 5% methane, with a benzene concentration of 16 ppb — there would almost certainly have been an explosion *from the methane*. There is no evidence whatever from which one could infer the concentration to which Tracy Pollock was exposed in the ambient air of her home and yard, but at the highest concentration possible, the methane — and consequently the level of benzene — could have been only a fraction of that in the sealed monitoring well. Kraft's opinion that she was chronically exposed to benzene concentrations of 160 ppb has no basis in the record. Indeed, it is directly contradicted by his own data showing such concentrations present only in the well. Kraft's opinion is the kind of naked conclusion that cannot support a judgment.

C

The purpose of Patel's testimony was to prove that Tracy Pollock's exposure to benzene concentrations of 160 ppb — assuming Kraft was correct — could cause Sarah's ALL *in utero*. The City does not challenge the reliability of Patel's data or methodology. The City concedes that Patel appropriately relied on epidemiological studies indicating that an unborn baby's exposure through her mother to chemicals, including benzene, is capable of causing chromosomal anomalies and childhood leukemia.²⁹ The study most favorable to Patel's view found that chromosomal aberrations like Sarah's may result from exposure to concentrations of benzene less than 10 ppm³⁰ — more than 60 times the level of exposure that Kraft claimed. Another study on which Patel relied found a correlation between exposure to concentrations of benzene greater than 31 ppm and a particular chromosomal aberration, but noted that the effect was “clear[ly] dose dependent”.³¹ The Pollocks' maximum claimed level of exposure is only 1/200th of that exposure. No study was offered showing a relationship between chromosomal anomalies like Sarah's and exposure to benzene at the lower levels the Pollocks claimed. This is perhaps hardly surprising, since the OSHA standard for maximum exposure to benzene in the work place is 1 ppm³² — more than six times the Pollocks'

²⁹ David A. Savitz & Kurtis W. Andrews, *Review of Epidemiologic Evidence on Benzene and Lymphatic and Hematopoietic Cancers*, 31 AM. J. OF INDUS. MED. 287, 292-294 (1997); Martyn T. Smith & Luoping Zhang, *Biomarkers of Leukemia Risk: Benzene as a Model*, 106 ENVTL. HEALTH PERSP. 937, 943 (1998); Henriette Van Steensel-Moll et al., *Childhood Leukemia and Parental Occupation: A Register-Based Case-Control Study*, 121 AM. J. OF EPIDEMIOLOGY 216, 223 (1985).

³⁰ Smith & Zhang, *supra* note 29, at 941.

³¹ Luoping Zhang et al., *Interphase Cytogenetics of Workers Exposed to Benzene*, 104 ENVTL. HEALTH PERSP. 1325, 1328 (1996).

³² 29 C.F.R. § 1910.1028(c)(1) (2008).

exposure, according to Kraft. Given this large gap between the exposure levels in the studies that Dr. Patel relied on and the concentration Kraft hypothesized that the Pollocks had been exposed to, those studies provide no basis for his opinion that the Pollocks' claimed benzene exposure caused Sarah's ALL.

Patel asserted that the Pollocks' exposure to benzene, as found by Kraft, was really higher than the exposure levels in the reports on which he relied because it occurred over a longer period. While it is possible that a long-term exposure to a low level of toxin might be worse than a short-term exposure to the toxin at much higher levels, it is just as likely, in the abstract, that the opposite is true.³³ Nothing in any of the materials on which Patel relied supported his assertion.

While some of Sarah's chromosomal anomalies were also found with exposure to benzene, Patel testified others were unrelated to benzene exposure. There is therefore no basis for Patel's testimony that Sarah's pattern of chromosomal anomalies indicate her ALL was benzene-induced. Because neither the epidemiological studies nor the similarities in Sarah's chromosomal anomalies support Patel's opinion that Sarah's ALL was caused by exposure to benzene *in utero*, his testimony was conclusory and cannot support liability.

³³ See, e.g., LAWRENCE G. CETRULO, TOXIC TORTS LITIGATION GUIDE § 5.14 (2008) ("Proof of exposure is not, by itself, sufficient to prove medical causation. A plaintiff must also prove that he was exposed to a sufficient amount, or dose, of a particular toxin to cause a particular disease. Virtually any agent, even tap water, may produce a toxic effect at a sufficiently high level of exposure. Conversely, it may be argued that even the deadliest poison is harmless at a sufficiently low level of exposure."); FEDERAL JUDICIAL CENTER, REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 403 (2000) (stating that a central tenet of toxicology is that "the dose makes the poison"; this implies that all chemical agents are intrinsically hazardous—whether they cause harm is only a question of dose. Even water, if consumed in large quantities, can be toxic." (footnote omitted)).

A few months after this case was tried, the court of appeals in *Exxon Corp. v. Makofski*³⁴ reviewed all of the studies the parties could produce attempting to link ALL to benzene exposure and concluded that nothing showed a correlation to meet the standard of probative evidence set by this Court in *Merrell Dow Pharmaceuticals, Inc. v. Havner*.³⁵ The court concluded that the unsupported opinions of the experts in that case were no evidence.³⁶ For the same reasons, we reach the same conclusion here. Patel's opinions were conclusory and provided no evidence that Sarah's ALL was caused by Tracy's exposure to benzene from the landfill.

III

The Pollocks claim property damages on the ground that the West Avenue landfill was a nuisance that amounted to a taking of property without adequate compensation in violation of article I, section 17 of the Texas Constitution.

We have held that the government's "mere negligence which eventually contributes to the destruction of property is not a taking";³⁷ rather, the government must act intentionally. This requirement is rooted in the constitutional provision that a compensable taking occurs "only if property is damaged or appropriated for or applied to public use."³⁸ An accidental destruction of

³⁴ 116 S.W.3d 176, 183 (Tex. App.–Houston [14th Dist.] 2003, pet. denied).

³⁵ 953 S.W.2d 706, 725-726 (Tex. 1997).

³⁶ Makofski, 116 S.W.3d at 187-188.

³⁷ *City of Tyler v. Likes*, 962 S.W.2d 489, 504-505 (Tex. 1997); *see also City of Dallas v. Jennings*, 142 S.W.3d 310, 313 (Tex. 2004)..

³⁸ *Tarrant Reg'l Water Dist. v. Gragg*, 151 S.W.3d 546, 554-555 (Tex. 2004) (internal quotation marks omitted) (quoting *Steele v. City of Houston*, 603 S.W.2d 786, 792 (Tex. 1980)(citing *Davis v. City of Lubbock*, 326 S.W.2d 699, 702-709 (Tex. 1959))).

property does not benefit the public. The public-use limitation “is the factor which distinguishes a negligence action from one under the constitution for destruction.”³⁹

For purposes of article I, section 17, a governmental entity acts intentionally if it knows either “that a specific act [was] causing identifiable harm” or “that the specific property damage [was] substantially certain to result from” the act.⁴⁰ A governmental entity is substantially certain that its actions will damage property only when the damage is “necessarily an incident to, or necessarily a consequential result of the [entity’s] action.”⁴¹ The government’s knowledge must be determined as of the time it acted, not with benefit of hindsight.⁴²

The Pollocks contend that the City knew its management of the West Avenue landfill⁴³ was damaging their property, or knew at least that damage to their property was a necessary result. But the evidence is all to the contrary. Whenever the City was aware that gas was migrating from the landfill, it took steps to prevent damage. It monitored gas generation, monitored leachate, and installed methane collection systems. We assume, as the Pollocks assert and the jury found, that those efforts were inadequate and that the City was negligent. But there is no evidence that the City knew that the Pollocks’ property was being damaged or that damage was a necessary consequence.

³⁹ *Gragg*, 151 S.W.3d at 555 (quoting *Steele*, 326 S.W.2d at 792).

⁴⁰ *Jennings*, 142 S.W.3d at 314.

⁴¹ *Id.* (citations omitted).

⁴² *Id.* at 315 (“[T]here is no evidence that the City knew, *when it unclogged the sewer line*, that any flooding damage would occur.” (emphasis added)).

⁴³ See *City of Tyler v. Likes*, 962 S.W.2d 489, 504-505 (Tex. 1997) (noting that a governmental entity may commit a taking through either the construction of a public work or the subsequent maintenance and operation of one).

The Pollocks contend that the fact the City knew that subsidence, ponding, and gas generation and migration are inherent in the operation of a landfill is sufficient to show that the City knew its operation of the landfill was substantially certain to damage their property. We rejected essentially the same argument in *City of Dallas v. Jennings*, where homeowners attempted to show the city's intent to damage their property by sewage flooding from the fact that the city knew that unclogging a sewer can sometimes cause it to back up.⁴⁴ The governmental entity's awareness of the mere possibility of damage is no evidence of intent. The damage the Pollocks claim — the migration of gas onto their property — is neither necessarily incident to or a consequential result of the operation of a landfill. It can be prevented.⁴⁵ The City's negligent failure to prevent landfill gas migration in this case is no evidence that it intended to damage the Pollocks' property.

Since there was no evidence of a compensable taking, the City is immune from the Pollocks' property damage claims.

* * *

We therefore reverse the court of appeals' judgment and render judgment that the Pollocks take nothing on their claims.

Nathan L. Hecht
Justice

Opinion delivered: May 1, 2009

⁴⁴ *Jennings*, 142 S.W.3d at 315.

⁴⁵ See Jeffrey Ball, *Pollution Credits Lets Dumps Double Dip*, WALL ST. J., Oct. 20, 2008, at A1. The EPA has issued detailed regulations regarding the operation of a methane collection system. 40 C.F.R. §§ 60.750-759 (2008).