

7-1-1982

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Recommended Citation

Robert C. Vohl, *Unearthing Defendants in Toxic Waste Litigation: Problems of Liability and Identification*, 19 SAN DIEGO L. REV. 891 (1982).

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UNEARTHING DEFENDANTS IN TOXIC WASTE LITIGATION: PROBLEMS OF LIABILITY AND IDENTIFICATION

Hazardous waste is emerging as a serious threat to public health. Deterrence of unsafe disposal practices and compensation for costs imposed on the public are primary concerns for both legislative and judicial action in this area. Litigation based on allegations of tort liability will be impeded by inadequately developed legal theory, particularly where a general disposal site is involved. This Comment evaluates the plausibility of integrating strict products liability and risk share liability (an adaptation of market share liability) into a unified approach that may provide tort victims with greater access to legal remedies.

INTRODUCTION

The potentially tragic human health consequences of disposal of toxic waste are now widely recognized.¹ Yet, practical solutions to the problem of compensating victims injured by toxic waste are at an embryonic stage. Toxic waste disposal sites across the nation are an increasing source of injuries to people living nearby.² Harmful substances escaping from these sites in the form of dangerous gases or groundwater leachates create a zone of danger that may extend far beyond the location of disposal.³ This Comment examines two significant barriers to obtaining compensation from waste generators⁴ posed by traditional

1. See generally M. BROWN, *LAYING WASTE: THE POISONING OF AMERICA BY TOXIC CHEMICALS* (1979).

2. There are an estimated 30,000 to 50,000 waste disposal sites across the United States of which at least 1,200 pose immediate health and safety hazards. See *Hazardous and Toxic Waste Disposal: Joint Hearings Before the Subcomm. on Environmental Pollution*, 96th Cong., 1st Sess., 37 (1979).

3. The Second Annual Resource Conservation and Recovery Act (RCRA) Report says that "the most widely significant effect" of land disposal is contamination of groundwater. 9 ENV'T REP. (BNA) 2303 (1979).

4. The term "generator" as used in this Comment will refer to one whose manufacturing operation produces a toxic waste.

proof requirements, and proposes possible approaches for alleviating them.

First, a major hurdle confronted by a plaintiff is the need for a viable theory of liability. Traditional common law theories provide tenuous support for claims arising out of toxic waste contamination.⁵ Under any theory, the waste generator is safely insulated from liability to toxic waste victims by virtue of typical "off-site" disposal practices.⁶ A plaintiff may have to prove the vicarious liability of the generator for harmful acts connected with the transportation of the waste or for activities associated with the disposal operation.⁷ The plausibility of strict products liability⁸ as an approach to compensation which transcends this hurdle will be evaluated.

The second problem of proof is posed by a potential inability of

5. Negligence actions and certain unintentional nuisance actions require a plaintiff to establish that the generator's failure to exercise reasonable care caused the alleged injury. RESTATEMENT (SECOND) OF TORTS § 282 (1976). Because of the necessity of establishing foreseeability in a negligence action, generators cannot be held liable when their knowledge at the time of the alleged act or omission is such that greater care is not warranted. See Pfenningstorf, *Environment, Damages, and Compensation*, 1979 AM. B. FOUND. RESEARCH J. 347, 372. See generally W. PROSSER, HANDBOOK OF THE LAW OF TORTS, § 41, at 236-37 (4th ed. 1971).

Actions under theories of nuisance or strict liability for abnormally dangerous activities may avoid the need to prove failure of reasonable care. See RESTATEMENT (SECOND) OF TORTS § 520 (1977) (sets forth six criteria a court must weigh in identifying an abnormally dangerous activity). See generally Rodburg, *Generator Liability for Off-Site Disposal*, in HAZARDOUS WASTE LITIGATION 100-32 (1981). Since these theories guide courts to balance the social utility of the implicated activities against their detrimental consequences, considerable discretion is exercised by the court. Moreover, these actions appropriately apply to transportation and disposal of wastes, not to waste generation. See *supra* notes 6-7 and accompanying text.

6. "Off-site" disposal refers to the practice of removing waste from the source of its generation to another (potentially distant) location. Waste generators often contract independent haulers to remove the waste from their facilities. Thus, control of the disposal operation, and consequential duties to the public at large, become responsibilities of third parties rather than generators. Accordingly, the generators are not subject to the common law duties that possessors of land must respect.

7. At common law, an employer ordinarily is not liable for torts committed by an independent contractor performing contractual duties. W. PROSSER, *supra* note 5, § 71. See generally Comment, *A Private Nuisance Approach to Hazardous Waste Disposal Sites*, 7 OHIO N.J.L. REV. 86, 94-95 (1980). See also RESTATEMENT (SECOND) OF TORTS § 822 (1979). Liability can be imputed to the generator where it is foreseeable that the independent contractor will commit a nuisance or trespass. RESTATEMENT (SECOND) OF TORTS § 427B (1965). However, it appears that there is no duty to inspect a disposal site operation. *Ewell v. Petro Processors, Inc.*, 364 So. 2d 604 (La. Ct. App. 1978), *cert. denied*, 366 So. 2d 575 (La. 1979). Consequently, vicarious liability is likely to fail.

8. See RESTATEMENT (SECOND) OF TORTS § 402A (1965), *infra* note 17. See generally Note, *Strict Liability For Generators, Transporters, and Disposers of Hazardous Waste*, 64 MINN. L. REV. 949, 977-85 (1980) (advocating a strict products liability cause of action).

plaintiffs to identify the defendant(s). This difficulty derives from the nature of toxic waste disposal. Toxic wastes are often disposed at municipal dumps, or at other sites that serve as receptacles for numerous types of waste from any number of generators. Even where records exist showing which generators are responsible for which toxic waste, it will be an onerous task to identify the party(s) responsible for victims' injuries. A plaintiff must, with scientific evidence, isolate the harmful substance, trace its path and show its origin.⁹

This Comment evaluates the parameters of the identification quandary in light of tort theories that ease plaintiff's burden of proof, and will encourage courts to adopt a more progressive analytical framework in the toxic waste context. The framework proposed herein assigns liability based on the risk of harm created by a generator, in the absence of evidence of actual cause-in-fact in a particular instance of injury. This mode of approaching the identification problem is somewhat analogous to the market share theory enunciated by the Supreme Court of California in the recent decision of *Sindell v. Abbott Laboratories*.¹⁰ Rather than allocating liability based on the relative market share of producers of a hazardous drug, as in *Sindell*, this Comment argues for an allocation of liability based on the relative risk share of generators in a toxic waste disposal "market" comprised of an aggregate threat of harm to a plaintiff, created by a dumpsite.

STRICT PRODUCTS LIABILITY

The internalization of all costs of production into the market, allowing prices to represent the true net social value of goods, should be the fundamental goal of a strict liability system.¹¹ The policies underlying strict products liability would appropriately apply to toxic waste generation. Justice Traynor's concurring

9. Soble, *A Proposal for the Administrative Compensation of Victims of Toxic Substance, Pollution: A Model Act*, 14 HARV. J. ON LEGIS. 683, 706 (1977).

10. See *Sindell v. Abbott Laboratories*, 26 Cal. 3d 588, 607 P.2d 924, 163 Cal. Rptr. 132 (1980), cert. denied, 449 U.S. 912 (1980); see also *Hardy v. Johns-Manville Sales Corp.*, 509 F. Supp. 1353 (E.D. Tex. 1981) (applying the market share liability theory articulated in *Sindell* to a variety of asbestos-related claims).

11. "[S]ocial and economic resources can be most efficiently allocated when the actual costs of goods and services (including the loss they entail) are reflected in their price to consumers." *Chavez v. Southern Pac. Transp. Co.*, 413 F. Supp. 1203, 1209 (E.D. Cal. 1976).

opinion in *Escola v. Coca-Cola Bottling Co.*¹² is the classic pronouncement of the important policies: 1) compensating innocent victims; 2) fixing responsibility wherever it will most effectively reduce the hazards of exposure to defective products; 3) shifting the cost to the manufacturer who can insure against the risks of injury and distribute them among the public as a cost of doing business; and 4) placing responsibility on the party who introduced the risk into the market place.¹³

A special justification of the strict products liability approach inheres in the nature of the toxic waste disposal site.¹⁴ Since numerous different substances may be deposited at a given site, the harmful effects of toxic waste may result from the combinations of and reactions between substances for which independent generators are responsible.¹⁵ A plaintiff may need to prove fault against each contributing generator on an individual basis because they are engaged in diverse activities entailing variable duties of care.

Moreover, a standard based on fault would provide insurmountable complexities if substances operate synergistically to induce injury.¹⁶ Waste which is innocuous by itself may become deadly when combined with other wastes at a disposal site. Liability for negligence in this scenario would require that the dangers of the reaction products be reasonably foreseeable by generators, in addition to the need to show vicarious liability for failure to contain the waste.

Strict products liability is defined in Restatement (Second) of Torts, Section 402A.¹⁷ California courts have already laid the foundations for creative applications of section 402A by constru-

12. 24 Cal. 2d 453, 461-68, 150 P.2d 436, 440-44 (1944).

13. See Note, *supra* note 8, at 983-84. Recently the strict liability policies have been cited in the toxic waste context. See *United States v. Marathon Pipe Line Co.*, 589 F.2d 1305 (7th Cir. 1978).

14. The California Supreme Court has repeatedly emphasized that "one of the principal purposes behind the strict products liability doctrine is to relieve an injured plaintiff of many of the onerous evidentiary burdens inherent in a negligence cause of action." *Barker v. Lull Eng'g Co.*, 20 Cal. 3d 413, 425, 573 P.2d 443, 455, 143 Cal. Rptr. 225, 237 (1978).

15. See *infra* notes 32-34 and accompanying text.

16. Comment, *Love Canal: Common Law Approaches to a Modern Tragedy*, 11 ENV'T L. 133, 141 (1981).

In the Love Canal, the unseemly nature of the underground chemical reactions enhances the danger . . . [T]he interactions of unneutralized and unsegregated chemical wastes indiscriminately mixed together (or even stored contiguously in drums which will inevitably rupture and leak) in a common disposal site . . . make up a congeries of slow chemical reactions having generally unspecified but potentially disastrous consequences over long periods of time.

17. RESTATEMENT (SECOND) OF TORTS § 402A (1965) sets forth the following criteria for strict products liability:

ing its provisions broadly in order to more fully effectuate the *Escola* policies. First, courts have recognized that the "unreasonably dangerous" language may unreasonably preclude recovery by plaintiffs.¹⁸ Second, the original "consumer expectations" test for defective product design¹⁹ has been substantially expanded.²⁰ Third, the "users and consumers" provision has

Special Liability of Seller of Product for Physical Harm to User or Consumer

- (1) One who sells any product in a defective condition unreasonably dangerous to the user or consumer or to his property is subject to liability for physical harm thereby caused to the ultimate user or consumer, or to his property, if
 - (a) the seller is engaged in selling such a product, and
 - (b) it is expected to and does reach the user or consumer without substantial change in the condition in which it is sold.
- (2) The rule stated in subsection (1) applies although
 - (a) the seller has exercised all possible care in the preparation and sale of his product, and
 - (b) the user or consumer has not bought the product from or entered into any contractual relation with the seller.

18. See *Cronin v. J.B.E. Olsen Corp.*, 8 Cal. 3d 121, 132, 501 P.2d 1153, 1162, 104 Cal. Rptr. 433, 442 (1972). The court declined to apply an "unreasonably dangerous" test because it "burdened the injured plaintiff with proof of an element that rings of negligence."

19. A design defect is an inherent hazardous flaw associated with a whole product line, as opposed to an individual unit (or a mistake in manufacturing). Defective design liability should be attributed to generators of hazardous waste because the manufacturing design, including the procedures that lead to dispensing the waste, creates the hazard. Concerning the proximate causation requirement, it is sufficient if the plaintiff proves that the defect "was a substantial factor contributing to his injuries" and that there was "a direct, rather than a remote, connection" between the defect and the injury. *Id.* at 127, 501 P.2d at 1157, 104 Cal. Rptr. at 437.

20. A defective product is one which "at the time it leaves the seller's hands [is] in a condition not contemplated by the ultimate consumer, [and] which will be unreasonably dangerous to him." RESTATEMENT (SECOND) OF TORTS § 402A comment g (1965).

The California Supreme Court has adopted a two-part test for design defects:

First, a product may be found defective in design if the plaintiff establishes that the product failed to perform as safely as an ordinary consumer would expect. . . . Second, a product may alternatively be found defective in design if the plaintiff demonstrates that the product's design proximately caused his injury and the defendant fails to establish that, on balance, the benefits of the challenged design outweigh the risk of danger inherent in such design.

Barker v. Lull Eng'g Co., 20 Cal. 3d 413, 432, 573 P.2d 443, 455-56, 143 Cal. Rptr. 225, 237-38 (1978). Under the second prong of the *Barker* test, the benefit of the design would be measured by the cost of reducing the waste output or insuring that safe disposal of toxic waste is practiced.

Nevertheless, the appropriate test to be applied in the toxic waste context should be the same as that which is applied to bystanders injured by defective products. A victim of toxic waste exposure should be presumed to have a reason-

been extended to cover bystanders.²¹ Pragmatic interpretations of the Restatement should extend its application to toxic waste.

A basic difficulty in applying strict products liability to a generator of toxic waste is that the generator is not "one who sells a product in a defective condition,"²² as defined by the Restatement Section 402A.²³ Toxic waste is merely a by-product of the primary products manufactured and sold. Nevertheless, courts should recognize that the waste residual of the final product is a defect of the product even though it is separated prior to sale; but for the sale of the product, the hazard would not exist. Manufacturers of toxic chemicals ought to be liable under product liability theory in cases where the intended use entails a foreseeable dispersion of a toxic waste into the environment. A hazard that becomes disjoined from the basic product should not be treated differently simply because the product has not been purchased at the time of the separation.

An additional problem in applying the Restatement to toxic waste is that those injured are not "users or consumers" of a product in accordance with the language of section 402A.²⁴ Toxic waste victims are bystanders of the by-product wastes of a production process. Many jurisdictions have permitted recovery by mere bystanders in products liability cases.²⁵ Bystanders are persons whose only connection with a defective product is that they are victims of the defect.²⁶ This extension of the Restatement should apply with equal force to victims of toxic waste exposure.

The policies justifying strict products liability are most appropriate for the protection of bystanders. Bystanders are in special need of protection because they have no opportunity to inspect the product that injures them.²⁷ Whereas users of products avail

able expectation of freedom from hazardous wastes released into the environment. See *infra* notes 25-27 and accompanying text.

21. See *infra* notes 25-27 and accompanying text.

22. Hazardous waste generation should be considered a design defect since it arises as an inherent characteristic of the manufacturing process.

23. See *supra* note 17.

24. *Id.*

25. See W. PROSSER, *supra* note 5, at 662-64.

26. *Id.* at 663. In *Greenman v. Yuba Power Prods., Inc.*, 59 Cal. 2d 57, 62, 377 P.2d 897, 900, 27 Cal. Rptr. 697, 700 (1963), the California Supreme Court stated: "A manufacturer is strictly liable in tort when an article he places on the market, knowing that it is to be used without inspection for defects, proves to have a defect that causes injury to a *human being*." (emphasis added). In the subsequent landmark case of *Elmore v. American Motors Co.*, 70 Cal. 2d 578, 586, 451 P.2d 84, 88-89, 75 Cal. Rptr. 652, 656-57 (1969), the California Supreme Court reiterated its previous ruling and expanded the doctrine: "[I]n both *Greenman* and *Vandermark* we did not limit the rules stated to consumers and users but instead used the language applicable to human beings generally."

27. "[I]f any distinction should be made between bystanders and users, it

themselves of the benefits of a commodity, bystanders do not. While some bystanders injured by defective products can at least enjoy the protection afforded by a consumer's inspection of the product during purchase and use, there is no such screen for safety with toxic waste. Although some degree of uncertainty may exist in strict products litigation whether injury is caused by the defect in the product or by misuse by the consumer, it is certain that toxic waste injuries are caused by hazards of the waste.²⁸

A defense may be advanced that a generator who does not wish to engage in the disposal of toxic waste should be free to shift the risk of liability to one who does. The products liability field long ago experienced a cumulative expansion of liability from the producer through the chain of distribution.²⁹ The "chain of distribution" for toxic waste disposal involves payments by a generator to a contractor, rather than a series of sales, as with a product. Nevertheless, it is as unreasonable to allow generators to purchase freedom from liability, as it would be to limit recovery in products liability to privity.

Permitting a generator to escape liability by passing on the disposal responsibility would compromise each policy supporting his liability.³⁰ The waste generator typically has greater assets than the hauler of the waste or the disposal site operator, and is in a better position to distribute the cost of compensation. Generally, a hauler of waste has no knowledge whatever of the potential human health hazards. The knowledge necessary to safely dispose of toxic wastes is highly specialized and more easily ascertained and developed by the generator.

A cause of action in strict liability for injuries caused by hazardous waste should compensate plaintiffs who prove injury is caused by toxic waste generated by the defendants. This action

should be made . . . to extend greater liability in favor of the bystanders." *Elmore v. American Motors Co.*, 70 Cal. 2d 578, 586, 451 P.2d 84, 89, 75 Cal. Rptr. 652, 657.

28. Whether an action sounds in negligence or strict products liability, in order for liability to attach, plaintiff must show by a preponderance of the evidence that the defective design of defendant's product actually caused the harm at issue. *W. PROSSER, supra* note 5, §§ 41, 103.

29. *MacPherson v. Buick Motor Co.*, 217 N.Y. 382, 111 N.E. 1050 (1916) (no privity requirement when product negligently made); *Henningsen v. Bloomfield Motors, Inc.*, 32 N.J. 358, 161 A. 2d 69 (1960) (liability of manufacturer for breach of implied warranty of safety running to persons lacking privity).

30. *See supra* note 13 and accompanying text.

should encompass all toxic wastes, irrespective of the lack of awareness regarding their hazards at the time of disposal.³¹

IDENTIFYING DEFENDANTS

An injured party who attempts to identify responsible defendants confronts substantial problems where a general disposal site is involved.³² Where many potential defendants exist, a plaintiff's action may fail for inability to prove his case against any individual defendant by a preponderance of the evidence. The cause-in-fact problem is compounded by the presence of many types of toxic waste in a given locale. These possibilities are often present in tandem in off-site (waste hauled from source) disposal of toxic waste.

The general disposal site becomes the focal point of a zone of danger when toxic wastes are not adequately contained. Toxic fumes or chemical leachates may migrate from the disposal site onto the properties and into the bodies of innocent victims.³³ Probably only a fraction of the substances found to have escaped will be responsible for the injuries sustained. Possibly only one substance, originating from one or more generators, is the actual cause of injury.³⁴ These problems may be aggravated by the length of time between disposal and the manifestation of the harmful effect.³⁵

Evolving tort theories have mitigated the burdens of proving cause-in-fact in multiple defendant cases. Their broadest application is warranted for toxic waste situations because of both the severe dangers posed and the complexities due to the nature of the disposal site.

Joint and Several Liability

Imposition of joint and several liability among several contributing polluters is possible where an indivisible injury is in-

31. See RESTATEMENT § 402A, *supra* note 17, subsec. (2)(a) (knowledge of product danger should not influence a determination of liability under the strict products rationale).

32. Harley, *Proof of Causation in Environmental Litigation*, in TOXIC TORTS pt. II, 405 (P. Rheingold & N. Landau eds. 1977).

33. See generally M. TODD, GROUNDWATER HYDROLOGY 44-47 (1959); M. BROWN, *supra* note 1, at 194-97.

34. Harley, *supra* note 32, at 405-06.

35. Recovery may be hindered by uncertainties resulting from long incubation periods for diseases and by statutes of limitations that do not have a "discovery rule." See Comment, *supra* note 16, at 146-53.

volved.³⁶ In *Landers v. East Texas Salt Water Disposal Co.*,³⁷ the court stated:

Where the tortious acts of two or more wrongdoers join to produce an indivisible injury, that is, an injury which from its nature cannot be apportioned with reasonable certainty to the individual wrongdoers, all of the wrongdoers will be held jointly and severally liable for the entire damages and the injured party may proceed to judgment against any one separately or against all in one suit.³⁸

The Restatement affirms this analysis of liability for pollution.³⁹ Where a particular defendant shows that a "reasonable basis" for pro rata apportionment of liability exists, a plaintiff may only recover for the proportionate amount of harm attributable to that defendant.⁴⁰

These theories may support the imposition of joint and several liability upon generators contributing to a toxic waste disposal site. An argument may be made that once the generators have contributed to the disposal site, no "reasonable basis" for division of the harm caused by the site can be discerned. However, this theory falters where a distinct injury is likely caused by a specific toxic waste.⁴¹ Where a collective contribution cannot be shown, there is no basis for labeling an injury "indivisible." A plausible argument for "indivisibility" might be advanced where multiple toxic wastes, possessing identical noxious qualities, may cumulatively cause injury.⁴²

36. RESTATEMENT (SECOND) OF TORTS § 875 and comments (1979); *Mitchie v. Great Lakes Steel Div.*, 495 F.2d 213 (6th Cir. 1974), *cert. denied*, 419 U.S. 997 (1974).

37. 151 Tex. 251, 248 S.W.2d 731 (1952).

38. *Id.* at 734.

39. RESTATEMENT (SECOND) OF TORTS § 433A comment i, illustrations 14, 15 (1965).

40. RESTATEMENT (SECOND) OF TORTS § 433A comment d, illustrations 3, 4 (1965).

41. *See generally* W. PROSSER, *supra* note 12, at 316.

42. In *Borel v. Fibreboard Paper Prods. Corp.*, 493 F.2d 1076 (5th Cir. 1973), *cert. denied*, 419 U.S. 869 (1974), several manufacturers of asbestos insulation were held jointly and severally liable for the total damages sustained by an insulation worker who contracted asbestosis as a result of working with defendants' products over a 33-year period. The court stated:

In the instant case, it is impossible, as a practical matter, to determine with absolute certainty which particular exposure to asbestos dust resulted in injury to Borel. It is undisputed, however, that Borel contracted asbestosis from inhaling asbestos dust and that he was exposed to the products of all the defendants. . . . It was also established that the effect of exposure to asbestos dust is cumulative, that is, each exposure may result in an additional and separate injury. We think, therefore, that on the basis of strong circumstantial evidence the jury could find that each defendant was the cause in fact of some injury to Borel.

Id. at 1094.

Shifting the Burden of Proof

Courts have aided plaintiffs by shifting the burden of proving factual causation if plaintiffs lack access to vital information. This practice has been justified under basic principles of fairness to an innocent victim: wrongdoers should not escape liability unless they can establish that their wrongful act did not in fact cause the harm.⁴³ Some courts, by liberally applying the *res ipsa loquitur* doctrine, have even been willing to hold all defendants liable in fact situations where it was certain that less than all were responsible.⁴⁴ In such cases, the public interest in compensation prevails over the potential unfairness to the particular non-cause-in-fact defendant.

A traditional prerequisite to shifting the burden of proof has been that a plaintiff name all parties who were or could have been responsible for the harm to the plaintiff.⁴⁵ This could pose special problems for the toxic waste victim, since numerous substances (toxic waste from a disposal site or other substances present in the environment) can be potential sources of injury. The greater the number of potential sources of harm, the more difficult it will be for a plaintiff to prove by a preponderance of evidence which substance(s) are or could have been the causal agents of a particular injury. The existence of potentially hundreds of harmful substances escaping from a disposal site, or lurking in the environment at large, reduces the likelihood that the small number of defendants amenable to suit are in fact responsible. Courts are hesitant to find liability when the group of defendants being sued may not even include the party solely responsible for the damages.

Market Share Liability

In *Sindell v. Abbott Laboratories*,⁴⁶ the California Supreme Court enunciated the "market share" theory of liability. The court created a modification of traditional cause-in-fact require-

43. *Summers v. Tice*, 33 Cal. 2d 80, 199 P.2d 1 (1948).

44. *Ybarra v. Spangard*, 25 Cal. 2d 486, 154 P.2d 687 (1944); *Litzman v. Humboldt Co.*, 273 P.2d 82 (1954) (hearing granted Aug. 6, 1954; dismissed Nov. 16, 1954).

45. RESTATEMENT (SECOND) TORTS § 433B (1965). The burden of proof shifts to the defendants only if the plaintiff can demonstrate that all defendants acted tortiously and that the harm resulted from one of them (comment g). It further states that this rule has heretofore only been applied where all actors involved are joined as defendants and where the conduct of all is simultaneous in time, but cases might arise in which some modification of the rule would be necessary if one of the actors is or cannot be joined, or because of the effects of a lapse of time, or other circumstances (comment h).

46. 26 Cal. 3d 588, 607 P.2d 924, 163 Cal. Rptr. 132 (1980).

ments by shifting the burden of proof where fewer than all potential defendants are sued. Application of this approach to a toxic waste disposal site scenario is warranted both by similarity between the cases and by underlying policy goals.

The market share approach assumes that when the specific manufacturers of a deleterious fungible drug cannot be identified through no fault of the plaintiff, the probability that the injury is caused by a particular manufacturer is directly proportional to the percentage of his market sales of the drug.⁴⁷ The court stated that:

If plaintiff joins in the action the manufacturers of a substantial share of the DES which her mother might have taken, the injustice of shifting the burden of proof to defendants to demonstrate that they could not have made the substance which injured plaintiff is significantly diminished . . . [W]e hold only that a substantial percentage [of the market] is required [to shift the burden].⁴⁸

Following this approach, "[e]ach defendant will be held liable for the proportion of the judgment represented by its share of that market unless it demonstrates that it could not have made the product which caused plaintiff's injuries."⁴⁹ The result of employing a market share apportionment is that each defendant's liability will approximate its responsibility for injuries caused by the DES it marketed.⁵⁰

The court relied on important policy considerations to support the imposition of liability against the manufacturers of an inordinately harmful substance.⁵¹ The court began its discussion with the broad proposition that:

In our contemporary complex industrialized society, advances in science and technology create fungible goods which may harm consumers and which cannot be traced to any particular producer. The response of the courts can either be to adhere rigidly to prior doctrine, denying recovery to those injured by such products, or to fashion remedies to meet these changing needs.⁵²

The principal policy relied on by the *Sindell* court was advanced formerly in *Summers v. Tice*:⁵³ as between an innocent plaintiff and negligent defendants, the latter should bear the cost of the in-

47. *Id.* at 611-12, 607 P.2d at 937, 163 Cal. Rptr. at 145.

48. *Id.*

49. *Id.* at 612, 607 P.2d at 937, 163 Cal. Rptr. at 145.

50. *Id.*

51. See *supra* notes 12-13 and accompanying text for a comparison of the policies supporting market share and strict products liability.

52. 26 Cal. 3d at 610, 607 P.2d at 936, 163 Cal. Rptr. at 144 (emphasis added).

53. See *supra* note 43 and accompanying text.

jury.⁵⁴ Another policy cited is that defendants are in a better position to bear the cost of injury resulting from a defective product because the risk of injury can be insured by the manufacturer and distributed to the public as a cost of doing business.⁵⁵ Additionally, the court notes the benefit of providing an incentive toward greater product safety.⁵⁶

Risk Share Liability: An Adaptation of the Market Share Theory to Toxic Waste

As in the case of a hazardous drug, an injury from exposure to toxic waste may be inflicted by numerous possible sources. The toxic waste "market" is comprised of all of the hazardous substances emanating from a dump site, as opposed to a market in the economic sense. The relevant share that each defendant contributes to the site is actually a share of the toxic waste (or by-product), rather than a portion of a market.⁵⁷ The overall market in the toxic waste scenario would therefore be comprised of the aggregate risk of harm posed to persons by all sources at a particular dumpsite.⁵⁸

Whereas the share of liability for DES injuries is based on proportionate contribution to the market, liability for toxic waste should be apportioned according to a defendant's contribution to the aggregate risk of harm. Although the wastes disposed are generally not fungible goods, their relative harm-producing capacities are, at least theoretically, susceptible of scientific quantification.⁵⁹ The quantitative differences between the risks of various substances can be measured in terms of characteristics such as their respective concentrations, toxicity (risk of harm to humans), and degradability in nature.⁶⁰

54. 26 Cal. 3d at 610-11, 607 P.2d at 936, 163 Cal. Rptr. at 144.

55. *Id.* at 611, 607 P.2d at 963, 163 Cal. Rptr. at 144.

56. *Id.*; see also *supra* notes 12-13 and accompanying text.

57. See *supra* notes 47-50 and accompanying text.

58. This basis of apportionment resembles causal allocation of liability. See generally M. Rizzo & F. Arnold, *Causal Apportionment in the Law of Torts: An Economic Theory*, 80 COLUM. L. REV. 1399 (1981) (argues for determining the relative importance of causes by referring to their general harm-producing capacities).

59. *Id.*

60. See Resource Conservation and Recovery Act § 3001(a), 42 U.S.C. § 6921(a) (1976 & Supp. III 1979). The statute provides that the Environmental Protection Agency (EPA) must promulgate criteria for identifying characteristics of hazardous waste and must establish a list of hazardous wastes. These criteria are required to take into account toxicity, persistence, degradability in nature, potential for accumulation in tissue, and other hazardous characteristics.

A degree of hazard classification system has been suggested by the Congressional Office of Technology Assessment (OTA) as a means for providing a cost effective strategy for managing hazardous wastes. The OTA noted that a quantitative degree of hazard classification system is feasible because particular

When a substantial⁶¹ "risk share" of potential causes for a particular injury is alleged by plaintiffs, the burden should shift to the defendants to extricate themselves from liability. The defendant may then prove that the substances responsible for the injury could not have originated from it, or that the waste could not have caused the alleged injury.

The risk share approach can also facilitate resolution of problems that arise when the harmful substance is identified but the sources are not. If a plaintiff can identify a substantial share of generators of a toxic waste which could have been disposed of at the site in question, a shift in the burden of proof should be warranted.⁶² This would require that a relevant geographic region be delineated from which the waste would likely have originated. Economic constraints on the transfer of wastes from their source to their disposal site would restrict the size of the relevant region. Liability would then be apportioned based upon the relative share of the waste being produced by a defendant-generator within that region.

Policy Justification for Risk Share Liability

Although some defendants who are found liable under risk share liability will not have actually contributed to a particular injury for which damages are sought, each generator found to be responsible for some share of the toxic waste which could have caused injury will undoubtedly be responsible for a comparable share of injuries caused by its own toxic waste. The court in *Sindell* implicitly assumes that each defendant causes harm correlating to its market share of sales.⁶³ Similarly, it is reasonable to assume that the presence of a predictably hazardous waste in

wastes share important characteristics and because scientific data and criteria that describe hazards are available or obtainable. 12 ENV'T REP. (BNA) 936 (1981). Such a system would provide scientifically derived statutory criteria by which courts could allocate liability.

61. *See supra* note 48 and accompanying text. This framework assumes that the wastes are hazardous at the time they leave the generator. If hazardous reaction-products result from commingling at the disposal site, generators responsible for the reacting wastes should be jointly and severally liable for the risk they catalyzed. *See supra* note 16 and accompanying text.

62. Evidence of waste generation should be considered *prima facie* evidence of improper disposal because, according to EPA estimates, up to 90% of all toxic wastes are disposed of improperly. 9 ENV'T REP. (BNA) 1301 (1978).

63. *See supra* note 50 and accompanying text.

the environment inevitably causes harm to people.⁶⁴

A shift in the burden of proof under these circumstances is justified under precisely the same grounds as the court cited in *Sindell*,⁶⁵ and derived from *Summers*:⁶⁶ the plaintiff is not at fault in failing to provide evidence of causation. The fact that the effects of toxic waste will generally be delayed,⁶⁷ coupled with the scientific uncertainty involved in dissecting the mechanisms of disease,⁶⁸ creates prohibitive barriers to the availability of proof to plaintiffs. In allocating liability between generators of an implicated toxic waste, a waste generator should either know, or be able to ascertain, the disposal site of its waste.⁶⁹ In addition, many defendants in a toxic waste suit have specialized scientific knowledge, particularly those engaged in the manufacture of chemicals. Accordingly, it would be fair to expect them to have superior access to information regarding the dispersion of toxic substances and their likely effects.

Where the precise harm-producing capabilities of certain toxic wastes are unknown, or the individual causal agent cannot be isolated, the burden of proof should shift to defendants who collectively create the risks of harm to a plaintiff via the hazardous waste. The court in *Sindell* placed a special emphasis on situations where medication is involved because the consumer is "virtually helpless to protect himself" from severe injuries caused by deleterious drugs.⁷⁰ Since toxic waste victims are not even aware that they are assimilating doses of harmful substances,⁷¹ they have a considerable need for the protection of these policies.

The availability of a combination of strict liability with a risk share allocation of responsibility serves similar policy goals.⁷² It is important to note that the *Sindell* court left open the theory of liability to be applied to the defendants found to share liability.⁷³

64. This is particularly true in a residential area where toxic substances persist in the groundwater.

65. See *supra* notes 52-56 and accompanying text.

66. 33 Cal. 2d 80, 199 P.2d 1 (1948).

67. See Council on Environmental Quality, *Carcinogens in the Environment*, in *Toxic Torts* pt. II, 69, 87-89 (P. Rheingold & N. Landau eds. 1977).

68. *Id.*

69. This makes his task of extricating himself from liability less onerous than a drug manufacturer of a fungible product.

70. *Sindell v. Abbott Laboratories*, 26 Cal. 3d 588, 611, 607 P.2d 924, 963, 163 Cal. Rptr. 132, 144.

71. See *supra* notes 52-56 and accompanying text.

72. See *supra* notes 12-13, 52-56 and accompanying text.

73. A shift in the burden of proof of causation should be no less available to plaintiffs when an action sounds in strict products liability than when an action sounds in negligence. In fact, greater justification may support a shift against multiple manufacturers of defective products; all producers of harmful products will likely be the causes-in-fact of some injuries, whereas some negligent defendants

The necessity of proving negligence against all generators of different wastes would markedly hinder the application of risk share liability.

CONCLUSION

Improper disposal of hazardous wastes will inevitably impose costs on third parties. Unless these real costs to society are internalized as an expense attendant to the production of goods, society will fail to optimally allocate its resources and injuries will go uncompensated. Policy justifies a strict liability standard against generators of toxic waste.

The same policy factors support a shift in the burden of proof when a plaintiff cannot meet this burden through no fault of his own. Risk share, a structural adaptation of the market share approach, could serve to effectuate a fair result where scientific uncertainty otherwise besets proof of factual cause. If injured parties are to receive due compensation from those responsible, courts will have to further flex their powers by "fashioning remedies to meet these changing needs."⁷⁴

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in the *Summers v. Tice* scenario may be causes-in-fact of no injuries. *See supra* note 54 and accompanying text. Furthermore, the broad policies sought to be implemented by the *Sindell* court by allowing a plaintiff to state a cause of action are derived from the strict products liability rationale. *See supra* notes 12-13 and 53-56 and accompanying text.

74. *Sindell v. Abbott Laboratories*, 26 Cal. 3d at 610, 607 P.2d at 936, 162 Cal. Rptr. at 144.

