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Groundwater Pollution: Case Law Theories for Relief

Peter N. Davis

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One-quarter of the earth's supply of fresh water lies underground. Traditionally over the centuries shallow wells have tapped this groundwater resource for domestic and livestock watering purposes. With the rise in industrial technology the uses of groundwater have multiplied, the depth of wells has increased, and the total withdrawals have increased. But the supply of groundwater is not inexhaustible. Groundwater already is in chronic shortage in many areas of the West where withdrawals exceed natural recharge by a significant amount; in effect, the groundwater is being "mined." Use of groundwater for various purposes, in the humid eastern states, also has been expanding rapidly in recent years, as local shortages of waters in rivers, streams and lakes and pollution of those watercourses proliferate. The East has experienced falling groundwater levels during droughts when withdrawals exceeded natural recharge.

This situation can only worsen as the demands for groundwater use increase. A congressional study in 1961 estimated that total daily water requirements would exceed 700 billion gallons per day by 1980 and 1,000 billion gallons per day by 2000. Our total available water supply is approximately 515 billion gallons per day. At present 80 percent of the water used in the United States comes from surface sources and the remainder from underground sources. Because our usable groundwater supplies are three times the size of our surface supplies, it is clear that much of the future growth in water use must depend on groundwater.
Pollution has the effect of reducing available water supplies. The discharge of wastes into rivers, streams and lakes degrades their usability for various consumptive and nonconsumptive uses. Pollution of groundwater renders it less valuable for the same purposes. Pollution of groundwater has been caused for centuries by privies, manure piles and cemeteries. In modern times, privy-substitutes (cesspools and septic tanks) and industrial wastes and spills are the most significant sources of pollution.

Some have advocated underground disposal as one method of getting rid of industrial wastes. The earliest attempts to use this method involved shallow sewage wells. A host of deeper, salt water disposal wells in oil and gas fields have been developed over the past few decades. Such wells involve either reinjection of salt water into existing salt water aquifers or injection of it into oil and gas reservoirs as a secondary recovery technique. Recently, interest is developing in the use of deep well injection of industrial liquid wastes as an alternative to treatment and discharge of wastes into surface watercourses. Well disposal obviates the cost of treating the wastes. In 1969 there were 150 such industrial waste disposal wells in the United States. This figure is expected to increase rapidly. At that time, refineries, chemical plants and steel mills owned 82 percent of industrial liquid waste disposal wells.

Underground disposal of waste does not always prevent pollution. One problem is that wastes are capable of migrating under natural forces. While every attempt is usually made to discharge wastes into strata which are separated from fresh water strata, that is not always effectively accomplished. Potable groundwater supplies have been polluted by waste injection operations. Salt water leaking along oil well casings and plugs and

percolating from surface disposal pits is a significant hazard to groundwater quality in many states.

This article will describe how the courts have utilized the common law to deal with the groundwater pollution problem. I have attempted to examine every groundwater pollution case reported in the United States, England, Ireland, Scotland, Canada, Australia and New Zealand. All of them, a total of 203, are listed in the Appendices. The purpose of this article is to analyze those cases to determine what rule the courts tend to use in particular kinds of groundwater pollution cases.

I. Rules Applicable to Percolating Groundwater Pollution

The courts have evolved a body of rules for allocating groundwater between conflicting users. Issues involving use, diversion and obstruction of water in identifiable underground streams are governed by the rules which allocate water in surface watercourses: riparian rights in the East and prior appropriation in the West. Conflicts involving use, diversion and obstruction of percolating groundwater are governed by one of several


10. See Table 1 in Appendix C infra. There were no groundwater pollution cases in Ireland, Scotland, Australia, and New Zealand.

11. Identifiable underground streams are those which are ascertainable from the surface by ordinary men without making excavations for the purpose of locating it. Typically a line of different vegetation, a series of potholes, a linear wet area, etc., are considered evidence of an underground stream. See note 115 and accompanying text infra.

12. Those two bodies of surface watercourse allocation law are discussed in many works on water rights law. I have summarized them in Davis, Wells and Streams 199-200.
allocation rules. These are absolute ownership, \(^\text{13}\) "reasonable use," \(^\text{14}\) eastern correlative rights, \(^\text{15}\) western "correlative rights" (common pool), \(^\text{16}\) and prior appropriation. \(^\text{17}\)

One would expect that the same rules which govern use, diversion and obstruction would govern pollution of groundwater since the practical consequences of pollution are no different than those of diversion or obstruction. In both cases, the neighboring landowner is deprived of his use of the groundwater. But such is not the case. In the vast majority of cases involving pollution of percolating groundwater either the law of negligence or the law of private nuisance governs. Of the 203 cases involving pollution of percolating groundwater in the United States, England and Canada, 75 cases utilized negligence law, 3 utilized public nuisance law, 84 utilized private nuisance law, 4 cases adopted the Restatement rule, 20 cases adopted a strict liability standard, and 15 cases did not specify what rule was being followed. Only 2 cases followed one of the percolating groundwater alloca-

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13. The landowner may make any use of the percolating groundwater he chooses on or off the land where the well is located or may make any use of his land which affects the movement of groundwater, without incurring liability for any resulting injury to his neighbor's percolating groundwater supply. *Id.* at 202.

14. The landowner is immune from liability if he uses the percolating groundwater on the land where the well is located and the use is reasonable per se. He is also immune if his use of the land affecting the percolating groundwater is per se reasonable. *Id.*

15. The landowner may make reasonable use of the percolating groundwater on the overlying land and may make reasonable use of the land which affects the movement of the groundwater. What is a reasonable use is determined by balancing the equities of the competing users for the purposes of determining both liability and relief. *Id.*

16. Where users over a common aquifer are taking out more groundwater than the annual natural recharge, all the users must proportionately cut back their use until withdrawal equals recharge. *Id.* at 203.

17. The first landowner to establish a right to divert water by posting or giving notice of intent to divert can use that water for beneficial uses, and he will be the last person cut off in times of scarcity. Later diverters are similarly cut off in inverse order of their priority dates. This rule for surface watercourses is applied to percolating groundwater when it is proven to be a tributary to a stream or part of its subflow or subsurface support. *Id.* at 204.

For a further discussion of the various rules for allocating groundwater see Thomas, *Water Law—Groundwater Rights in Missouri—A Need for Clarification*, 37 Mo. L. Rev. 357 (1972), which discussed the distinction between the so-called "reasonable use" rule and the eastern correlative rights rule.

States following the absolute ownership, "reasonable use," and eastern correlative rights rules are listed, with representative citations, in Davis, *Wells and Streams* 238-34.

tion rules. This is true even though many of the cases expressly acknowledge that the allocation rules govern use, diversion and obstruction situations. Of course, since a majority of eastern cases involving pollution of surface watercourses apply public and private nuisance law rather than riparian rights rules, it is not surprising that courts utilize nuisance law in the percolating groundwater pollution situation as well.

One explanation of why the courts follow relatively strict negligence or nuisance theories rather than the percolating groundwater allocation rules in pollution situations is that the courts are less sympathetic to a landowner who pollutes percolating groundwater than they are to one who diverts it to the injury of his neighbor. This attitude is expressed by courts which have stated that a landowner has no right to poison percolating groundwater so that when it reaches his neighbor’s land the neighbor cannot use it; a well owner has the right to take percolating groundwater in its natural state and from its natural source, and a landowner has no right to destroy the neighboring owner’s rights to appropriate percolating groundwater by contaminating the source. The application of negligence or nuisance law manifests this sympathy insofar as negligence law permits the granting of relief in many pollution situations and nuisance law permits the granting of relief in most pollution situations, whereas the two percolating groundwater allocation rules (the absolute ownership rule and the reasonable use rule) prevalent outside the western prior appropriation states deny relief in most pollution situations. For instance, the absolute ownership rules would give

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18. See Table 1 in Appendix C infra.

The tentative revision to the RESTATEMENT OF TORTS is based on the supposition that percolating groundwater allocation rules will not be followed in pollution cases and that the liability will be imposed only on the basis of nuisance, trespass, negligence or abnormally dangerous conduct. RESTATEMENT (SECOND) OF TORTS § 849 (Tent. Draft No. 17, 1971).

19. See cases cited note 31 infra.

20. Out of 445 surface watercourse pollution cases in American jurisdictions recognizing riparian rights, 233 cases applied private nuisance law, 75 cases applied public nuisance law and 137 cases applied riparian rights law. Davis, THEORIES OF WATER POLLUTION LITIGATION, 1971 WIS. L. REV. 738, 742-43, (reprinted 1972 ENVIRON. L. REV. 237, 1972 CORPORATE COUNSEL’S ANNUAL 839) [hereinafter cited as Davis, Water Pollution Litigation]. A comparison was not made of surface watercourse pollution cases choosing between nuisance law and prior appropriation law in the western prior appropriation jurisdictions.


almost a complete immunity to polluters by permitting landowners to make any use or diversion of percolating groundwater or to make any use of land affecting or obstructing percolating groundwater, regardless of the consequences on his neighbor’s percolating groundwater supply. One reason often given for this latter rule is that, since the landowner cannot ascertain in advance what the consequences of his activity will be because the movement of percolating groundwater is not apparent or readily ascertainable, it is therefore not fair to impose a liability upon him. It is argued that to impose a doctrine of correlative rights under those circumstances would deter economic development.

The second main eastern groundwater rule, the “reasonable use” rule, immunizes the landowner from liability wherever he disturbs groundwater on that land. The only major exceptions to the substantially unrestricted


See also 6A AMERICAN LAW OF PROPERTY § 28.65 (A.J. Casner ed. 1954); RESTATEMENT (SECOND) OF TORTS Explanatory Notes § 858A at 152-53 (Tent. Draft No. 17, 1971); RESTATEMENT OF TORTS § 832, comment d at 268, § 845, comment b at 833 (1939); Davis, Wells and Streams 201-02; Ellis, supra note 17, at 21; Hanks & Hanks, supra note 17, at 631-53; Maloney, Plager & Baldwin, supra note 17, at 154-55; Maloney & Plager, supra note 17, at 767-68; Comment, supra note 17, at 492-94; Thomas, supra note 17, at 359.


See also 6A AMERICAN LAW OF PROPERTY § 28.65 (A.J. Casner ed. 1954); RESTATEMENT (SECOND) OF TORTS Explanatory Notes § 858A at 152-53 (Tent. Draft No. 17, 1971); Davis, Wells and Streams 202-03; Ellis, supra note 17, at 21; Hanks & Hanks, supra note 17, at 633-37; Maloney, Plager & Baldwin, supra note 17, at 155-68; Maloney & Plager, supra note 17, at 766-70; Comment, supra note 17, at 495-98; Thomas, supra note 17, at 360.
right of capture permitted by those two rules are negligent activities and activities engaged in after the landowner acquires both knowledge of the movement of the percolating groundwater in question and of the probable consequences of his activity. Recognizing that the groundwater allocation rules would deny relief in most situations, one court expressly rejected the application of the absolute ownership rule in pollution situations. Many cases have effected an alternative approach to the same end by applying negligence or nuisance law in pollution situations despite their express reaffirmation of the general applicability of the allocation rules. Thirteen such cases have granted relief and fourteen have denied relief. By contrast, six cases have denied relief under absolute ownership and three cases have denied relief under the so-called "reasonable use" rule. No cases have granted relief under those two rules.

Insofar as the eastern correlative rights rule allows recovery in many pollution situations courts following that rule need not feel so compelled to follow negligence or nuisance law. The eastern correlative rights rule applies a comparative reasonableness test similar to that used in the modern reason-

29. See cases cited note 58 infra.
32. For cases granting relief, see cases coded a-c, cited in note 31 supra. For cases denying relief, see cases coded d-k. Id.
able use formulation of the riparian rights doctrine. Negligence and the nuisance effects of groundwater pollution normally would be two of the several factors considered by the courts under that rule. Therefore, their application need not be considered exceptions to the general allocation rule. However, only a few jurisdictions have adopted the eastern correlative rights rule. Accordingly, its application to pollution situations is limited at the present time. Only three cases have stated that the correlative rights rule would apply to pollution situations. But the two cases which found pollution and granted or denied relief did not apply that rule. Instead, they treated negligence as an exception to the general rule rather than as one of the balancing factors.

While courts have overwhelmingly preferred nuisance law to diversion allocation rules in percolating groundwater pollution cases, the preference for nuisance law over negligence law is slight. Furthermore, there is little correlation between the courts which apply nuisance law to surface watercourse pollution and those which apply it to percolating groundwater pollution. Only eight states strongly prefer the use of private nuisance law in both surface watercourse and percolating groundwater pollution situations. Indeed two states strongly prefer nuisance law for surface watercourse pollution, while rejecting it in favor of negligence law in percolating groundwater pollution situations. Many courts are ambivalent about the choice between nuisance law and negligence law in groundwater pollution cases. One explanation for a nuisance preference in groundwater cases might be that this approach allows for liability without any finding of culpability. This last requirement is not too onerous in surface water cases where the polluter can reasonably assess the consequences of his acts. However it creates problems in subsurface cases because he often cannot predict the results of his polluting activity. Use of negligence law permits the courts to take into account the ability of each particular polluter to predict


See also Davis, Wells and Streams 203-04; Maloney, Plager & Baldwin, supra note 17, at 157-58; Maloney & Plager, supra note 17, at 770-71; Thomas, supra note 17, at 360. Hanks & Hanks, supra note 17, at 643-44, incorrectly state the view that Arkansas, Delaware, Minnesota, and Tennessee have adopted the western correlative rights rule, which is a prorationing concept to be employed during shortages. See Davis, Wells and Streams 203.

36. The seven states are listed in note 137 infra.

37. See cases cited in note 35 supra.

38. See the North-East Coal (deny relief) and the Ballantine (grant relief) cases note 35 supra.

39. See text accompanying note 18 supra.

40. Arkansas, Illinois, Iowa, Kansas, Kentucky, Minnesota, Nebraska, and Wisconsin. See Table 1 in Appendix C infra.

41. Missouri and Oklahoma. Id.

42. Id.
the consequences of his activity.

Because most courts have refused to apply the diversion allocation rules to pollution of percolating groundwater, the real choices have been negligence law, nuisance law, their derivative the Restatement rule, and strict liability for escape of abnormally dangerous substances.

II. DISTINCTION BETWEEN NEGLIGENCE AND NUISANCE LAW

The courts have utilized negligence law and nuisance law about equally in percolating groundwater pollution situations. There are 74 negligence law cases, 3 public nuisance, 83 private nuisance cases and 4 Restatement rule cases reported in the United States, England and Canada. Of the 41 jurisdictions which have consistently followed one of these bodies of law, only 5 have clearly preferred negligence law, while 10 have preferred nuisance law, and 2 have adopted the Restatement rule. The remaining 24 jurisdictions are ambivalent about the choice of law. This section will discuss the various legal grounds for choosing one body of law or the other. It will also analyze the various types of fact situations where the courts have used one or the other, to determine if there are any clear legal or factual guideposts for making the choice.

A. Negligence

The use of negligence law in deciding percolating groundwater pollution cases probably arises from the general proposition that the percolating groundwater diversion allocation rules should be followed when an injury to a neighboring landowner’s water supply occurs under circumstances in which the injury is not to be expected, is not known, or would not have become known in the exercise of reasonable foresight. According to negligence theory, a groundwater user will be liable for his pollution if he knew or should have known that his activity would be likely to cause the injury which occurred. The focus for determining liability under negligence theory is not directed at the care with which the groundwater user has conducted his business, but is instead directed at the predictability of injurious consequences arising from his activity, however carefully con-
This concept of negligence explains those cases which hold that negligence law, rather than nuisance law, should be utilized where percolating groundwater pollution is caused by an occurrence or activity involving, neither unavoidable consequences nor consequences naturally anticipated. In other words, if, in the normal conduct of an activity, groundwater pollution will not occur, the court will follow negligence law when it does occur.

B. Private Nuisance

Nuisance, by contrast, does not look at either the comparative reasonableness of a person’s conduct or activity or at the predictability of the injurious consequences arising from it. Instead it addresses itself to the nature of those injurious consequences and the reasonableness of their impact on the injured landowner. Hence, a nuisance can be created both by negligent activities and non-negligent activities, as some percolating groundwater pollution cases have recognized. A private nuisance is an interference with private property interests; Prosser defines it as:

[A]n unreasonable interference with the interest in the use and enjoyment of land . . . It is distinguished from trespass in that the interference is with use or enjoyment, rather than with the interest in exclusive possession.

One case, dealing with pollution of a surface watercourse, comprehensively defined a private nuisance as one involving:

[S]uch impurities as substantially impair [the water’s] value for the ordinary purposes of life, and render it measurably unfit for domestic purposes, or such as causes unwholesome or offensive vapors or odors to arise from the water, and thus impairs the comfortable or beneficial enjoyment of property in its vicinity . . .

Typical examples of nuisances created by water pollution are pollution of domestic, livestock, and public water supplies and creation of odors inter-
ferring with places of habitation or employment.\textsuperscript{54} Percolating groundwater cases expressly acknowledge that a nuisance is created when underground water is so contaminated that it cannot be used for a domestic or livestock water supply.\textsuperscript{55}

Activities which are closely related to the user's land, or productive use of his particular land, are said not to constitute nuisances.\textsuperscript{56} They do not fall within the general nuisance classification even though such activities may involve unavoidable or foreseeable interference with another's land.\textsuperscript{57} Hence, pollution caused by mine drainage or oil well salt water would not constitute a nuisance and would be governed by negligence law, since those are uses specifically tied to particular locations. By contrast, pollution caused by gas manufacturing residues or oil refinery leaks would constitute a nuisance; they are not required to be located in a particular place, and such pollution is a probable consequence of the activity.

Many courts have stated that continuing a polluting activity once the pollution situation comes to the attention of the polluter also constitutes a nuisance.\textsuperscript{58} This is true whether negligence or nuisance law would be applied to injuries occurring prior to the polluter becoming aware of it.

\section*{C. Statistical Analysis of the Cases}

It is interesting to test the aforementioned theoretical definitions of negligence and private nuisance against the results which the courts have reached in actual cases. In this regard, the following questions are particularly important:

(1) Do the courts follow nuisance law when the pollution is an unavoidable consequence of the activity, or at least a consequence naturally to be anticipated as they say they do? Stated conversely, do the courts follow negligence law when the actor could anticipate the pollution and when he knew that the pollution would occur?

\textsuperscript{54} Davis, \textit{Water Pollution Litigation} 750.
\textsuperscript{55} See, e.g., Swift & Co. v. Peoples Coal & Oil Co., 121 Conn. 579, 590-92, 186 A. 629, 634 (1936); Kinnaird v. Standard Oil Co., 89 Ky. 468, 474, 12 S.W. 937, 938 (1890); Ballard v. Tomlinson, 29 Ch. D. 115, 126 (C.A. 1885) (per Lindley, L.J.).
Do the courts apply the above nuisance rule to all situations or only when the activity does not have a necessary relationship to the particular land where the activity is conducted as they indicate they will?

Does continuation of the polluting activity without a good faith effort to abate after the polluter becomes aware of the injurious consequences of his activity cause the courts to shift the case from negligence law to private nuisance law as they indicate it will?

The answers can be ascertained by analyzing the factual and decisional theory relationships in the percolating groundwater pollution cases.

In referring to the first question above concerning predictability, these types of uses can be subdivided into two groups: those having a propensity for causing pollution, such as oil refineries, gas manufacturing plants, factories and cemeteries (at least before burial in vaults became mandatory), and those having little likelihood of causing pollution with normal operations, such as pipelines and service stations. Nuisance law, it is asserted, applies in the first subdivided group of situations, and negligence law applies in the second group. Theoretically negligence law also applies in situations where the activity has a necessary relationship to the land; certain uses of land must be conducted in particular places. These include uses such as mining and the recovery of oil and gas.

The cases seem to bear out the accuracy of such a classification of fact situations. The following table shows the law applied to the above described groups of cases.\[59\]

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\[59\] See Table 2 in Appendix C infra and cases coded by the respective letters in Appendix B infra.
TABLE I

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Negligence (no. of cases)</td>
<td>Nuisance (no. of cases)</td>
<td></td>
</tr>
<tr>
<td>1. Polluting activity does not have necessary relation to tract of land</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Pollution probable (nuisance law predicted)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- oil refinery or distributor</td>
<td>H</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>- gas plant</td>
<td>K</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>- factory or other commercial activity</td>
<td>L</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>- cemetery</td>
<td>Q</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>12</td>
<td>46</td>
</tr>
<tr>
<td>b. Pollution unlikely (negligence law predicted)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- pipeline</td>
<td>I</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>- service station</td>
<td>J</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>18</td>
<td>7</td>
</tr>
<tr>
<td>2. Polluting activity has necessary relation to tract of land (negligence law predicted)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- mining</td>
<td>E</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>- oil well</td>
<td>G</td>
<td>26</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>29</td>
<td>3</td>
</tr>
</tbody>
</table>

This table shows that the courts tend to utilize nuisance and negligence law in the manner called for by the rules concerning the activity's relationship to the land and its propensity to cause pollution.60

The courts tend to regard human and animal waste products as being potentially polluting and, therefore, governed by nuisance law. The following table shows the law applied to human and animal waste situations.61

TABLE II

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Negligence (no. of cases)</td>
<td>Nuisance (no. of cases)</td>
<td></td>
</tr>
<tr>
<td>Human or animal waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- domestic sewage</td>
<td>A</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>- city sewer</td>
<td>B</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>- city treatment plant</td>
<td>C</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>- collective source</td>
<td>D</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>- farm wastes</td>
<td>M</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>10</td>
<td>23</td>
</tr>
</tbody>
</table>

The tendency toward nuisance law in these cases, while not as pronounced as in the groups of cases in Table I, is significant. It can be regarded as

60. Because the great majority of these cases involved pollution of domestic and livestock water supplies, the nature of the consequences of the pollution did not influence the choice of theory, and therefore, the results reflect the source of the pollution.

61. See Table 2 in Appendix C infra and cases coded by the respective letters in Appendix B infra.
another illustration of the rule that activities having no necessary relation to particular tracts of land and being probable sources of pollution are governed by nuisance law.

The third question focuses on the effect which abatement, or on the other hand, failure to abate, will have on the choice of theory. It is said that nuisance law will be applied if a polluter fails to abate after being requested to do so by the injured landowner, whereas negligence law will be applied if a good faith effort is made to abate. The following table classifies cases on the basis of abatement after notice. In all of them the causal connection between the activity and the pollution was established.

**TABLE III**

<table>
<thead>
<tr>
<th>Rule Followed</th>
<th>No. of Cases</th>
<th>Footnote No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defendant abates or attempts to abate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- negligence law applied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plaintiff wins (a-b,*)</td>
<td>10</td>
<td>63</td>
</tr>
<tr>
<td>Defendant wins on basis of rule (d)</td>
<td>6</td>
<td>64</td>
</tr>
<tr>
<td>Defendant refuses to abate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- nuisance law applied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plaintiff wins (a-b,*)</td>
<td>8</td>
<td>65</td>
</tr>
<tr>
<td>Defendant wins (d)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Defendant fails to abate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- nuisance law applied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plaintiff wins (a-b,*)</td>
<td>19</td>
<td>66</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td></td>
</tr>
</tbody>
</table>

**Rule Not Followed**

| Defendant abates or attempts to abate      |              |              |
| - nuisance law applied                     |              |              |
| Plaintiff wins (a-b,*)                     | 4            | 67           |
| Defendant wins on basis of rule (d)        | -            | -            |
| Defendant refuses to abate                 |              |              |
| - negligence law applied                   |              |              |
| Plaintiff wins (a-b,*)                     | 2            | 68           |
| Defendant wins (d)                         | -            | -            |
| Defendant fails to abate                   |              |              |
| - negligence law applied                   |              |              |
| Plaintiff wins (a-b,*)                     | 16           | 69           |
| Defendant wins (d)                         | 9            | 70           |
| Total                                      | 31           |             |

This table indicates that the asserted rule was followed in 58 percent of the cases. Because attempt, refusal, or failure to abate a polluting

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62. See cases cited note 56 supra stating such a rule.

1961) (J1a). Consult the Appendices for the case codings.


68. Brown v. Illius, 25 Conn. 583 (1857) (K5a); Woodward v. Aborn, 35 Me. 271 (1853) (M1a).


activity may influence the theory applied, those case totals may not represent any clear trend favoring the asserted rule. At best they only suggest that such a rule may exist.

D. Other Suggested Rules for Choosing Between Negligence and Nuisance

Two courts have suggested that, in mining and oil and gas well situations, the rule applying negligence law to pollution caused by activities having a necessary relation to the tract of land is applicable only as between the holder of the surface interest and the holder of the mineral interest in the same tract of land. As between the holder of the mineral interest and unrelated adjoining landowners the law of nuisance is said to apply.71

This rule is not supported by other cases. All 10 cases involving pollution of a surface owner's well by the activities of the underlying mineral owner utilized negligence law.72 However, contrary to the suggested rule, 15 cases involving pollution of percolating groundwater which was caused by the activities of unrelated mineral owners on neighboring lands, have been decided on the basis of negligence law.73 Only three cases were decided on the basis of nuisance law in conformance with the suggested rule.74 Courts


decide the vast majority of all mining and oil and gas well cases under negligence law regardless of the relationship between the polluter and the injured surface owner. Therefore, it would appear the relationship between the two is irrelevant in the determination whether to utilize negligence or nuisance law.

Two courts have suggested that industrial states tend to utilize negligence law in percolating groundwater pollution situations, while agricultural states tend to utilize nuisance law or strict liability rules. The cases do not substantiate that assertion. As noted before, most states are ambivalent about the choice between negligence and nuisance law. Both industrial and agricultural states are included in this group. There are some states which seem to confirm the assertion; three industrial states follow negligence law and seven agricultural states follow nuisance law. But the assertion cannot be said to constitute a rule when industrial and mining jurisdictions such as Kentucky, Massachusetts and England utilize nuisance law, agricultural states such as Missouri and Oklahoma utilize negligence law, and a large group of states utilize both in roughly equal amounts. No state preferred strict liability rules.

I concluded in a previous article that in surface watercourse pollution cases the courts will follow private nuisance law when traditional nuisance types of pollution are treated and riparian rights law will be applied when non-nuisance types of pollution are created. One might expect a similar pattern in percolating groundwater pollution cases; if traditional nuisances were involved, decisions would be based on private nuisance law, while non-nuisance types of pollution would be decided under negligence law. Such a pattern does not exist. Nearly all of the 180 cases involved traditional nuisance types of pollution (166 cases), and they are about evenly split on decisional theory between private nuisance law (97 cases) and

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75. See discussion and table accompanying note 59 supra.
77. Ambivalent industrial states include Connecticut, Illinois, Ohio and Pennsylvania. Ambivalent agricultural states include Alabama and Maine. See Table 1 in Appendix C infra.
78. New Jersey, New York and Rhode Island. Id.
79. Arkansas, Iowa, Kansas, Minnesota, Nebraska, Washington and Wisconsin. Id.
80. Id.
81. Id.
82. Davis, Water Pollution Litigation 738.
83. Traditional nuisances include such injuries as poisoning of a domestic or livestock water supply, degradation of soil fertility, and odors interfering with habitation and places of work.
84. Where traditional nuisances were created, 199 surface watercourse pollution cases applied private nuisance law while only 66 applied riparian rights law. Where non-nuisance types of pollution were created, only 34 applied private nuisance law while 70 applied riparian rights law. Davis, Water Pollution Litigation App. D, at 805-06.
negligence law (83 cases). There are only a few cases (14) involving non-nuisance types of pollution. They are also almost evenly split between private nuisance law (6 cases) and negligence law (8 cases). The only conclusion is that the type of pollution injury suffered has no bearing on the choice between private nuisance law and negligence law as the basis for deciding the case.

III. RESTATEMENT RULE

Two states have broken away from the common law rules of negligence and nuisance in percolating groundwater cases and have adopted the Restatement rule concerning interferences with the use of land. Section 822 of the Restatement of Torts provides:

The actor is liable in an action for damages for a non-trespassory invasion of another's interest in the private use and enjoyment of land if,

(a) the other has property rights and privileges in respect to the use or enjoyment interfered with; and
(b) the invasion is substantial; and
(c) the actor's conduct is a legal cause of the invasion; and
(d) the invasion is either
   (i) intentional and unreasonable; or
   (ii) unintentional and otherwise actionable under the rules governing liability for negligent, reckless or ultrahazardous conduct.

Whether this rule makes any basic changes in the law of nuisance depends on the Restatement's definition of "intentional" and "unreasonable". Under the Restatement an actor commits an intentional invasion when he does either of the following:

(a) acts for the purpose of causing it; or
(b) knows that it is resulting or is substantially certain to result from his conduct.

This language makes common law nuisances unactionable when they are created by non-negligent activity where the actor either took every precaution to avoid the invasion or did not expect the particular invasion which occurred. An illustration in the Restatement makes this clear.

[A owns a parcel of land on which he erects and starts to operate a factory. B owns land 200 yards from A's factory on which he operates a poultry farm.] B gets water for his poultry business from a well on his land, and A dumps the waste matter in a depression on his land from which it seeps into the ground and is carried 300 yards underground to B's well by an unknown flow of percolating water. The water in B's well is contaminated so that it can-

85. See Table 3, in Appendix C infra.
87. Restatement of Torts § 822 (1939).
88. Restatement of Torts § 825 (1939).
not be used in his poultry business for some time. The invasion of B's interest in the use and enjoyment of his land is not intentional. 89

Professor Fleming James objected to Section 822's language because it improperly reflects the case law: there are many nuisance cases imposing liability where the actor intentionally conducted an activity which caused an unintended injury even though he was not negligent, reckless or conducting an ultrahazardous or abnormally dangerous activity. They impose liability because the injury suffered is too great to be borne without compensation. 90

The percolating groundwater pollution cases support Professor James' objection. Eleven utilize nuisance law and impose liability where the Restatement rule would have made the invasion unactionable. These cases involved oil distributor storage leaks, 91 pipeline leaks, 92 service station gasoline leaks, 93 furnace oil tank leaks, 94 gas manufacturing residues, 95 gas main leaks, 96 manure pile drainage, 97 and buried animals. 98 In each, the lawsuit was brought relatively soon after the pollution was discovered, and the polluter did not refuse to abate the pollution: in most, abatement was effected. 99 However, there are eight cases, involving disposal of human wastes, 100 pipeline leaks, 101 and service station gasoline leaks, 102 which refused to impose liability under those circumstances. They invoked negligence law. The Restatement would find no liability in all these 19 fact situations, although the courts imposed liability in a majority of them under

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89. Restatement of Torts § 825, illustration No. 3 (1939). Illustration 3 to Restatement of Torts § 832 (1958) also supports this view. The bracketed language is from illustration 2 in § 825.
92. Shelley v. Ozark Pipe Line Corp., 327 Mo. 238, 37 S.W.2d 518 (1931);
93. Continental Oil Co. v. Berry, 52 S.W.2d 953 (Tex. Civ. App. 1932);
95. Berger v. Minneapolis Gaslight Co., 60 Minn. 286, 62 N.W. 336 (1895);
99. The Restatement makes actionable pollution occurring after the polluter "knows" it is resulting. See text accompanying note 88 supra. The cases selected do not fall within that actionable category.
nuisance law. This is strong evidence that the Restatement rule runs counter to the predominant precedent. The tentative revisions of the Restatement have not altered this approach to private nuisance. I agree with Professor James that the Restatement neither represents the existing law, at least with respect to percolating groundwater pollution, nor does it represent a desirable rule for the future.

IV. STRICT LIABILITY

Eleven jurisdictions have imposed strict liability for certain types of percolating groundwater pollution. In several of these jurisdictions it was imposed by statute. Two followed the abnormally dangerous conduct rule which is defined by a tentative revision of the Restatement of Torts. It is significant that the courts have imposed strict liability only where activities of the oil and gas industry, mining industry and manufactured gas industry have caused the pollution. Thus the courts have found pollution caused by salt water from oil wells, acid mine wastes, oil pipeline leaks, and residues from gas manufacturing plants particularly obnoxious and subject to strict liability. This is true in spite of the fact that the majority of other states have preferred negligence law to nuisance law for controlling the polluting activities of the mining and oil and gas industries, and nuisance law is only preferred in cases dealing with pollution caused by the manufacture of gas. These 11 jurisdictions apparently follow the abnormally dangerous conduct rule in the above

103. While many of the cases in the two groups are not distinguishable on the facts, eleven of the fifteen cases not involving disposal of human wastes imposed liability under nuisance law.

104. RESTATEMENT (SECOND) OF TORTS §822 (Tent. Draft No. 16, 1970), provides:

One is subject to liability for a private nuisance if, but only if, his conduct is a legal cause of the invasion of the interest in the private use and enjoyment of land, and such invasion is

(a) intentional and unreasonable,
(b) negligent or reckless, or
(c) actionable under the rules governing liability for abnormally dangerous conditions or activities.


106. Kansas, Pennsylvania and England. Id.


108. See Table 2, in Appendix C infra.


110. See Table 2, in Appendix C infra and text accompanying note 75 supra. See also Pt. II, §A and B of this article.

111. See Table 2, in Appendix C infra and discussion at Pt. II, §§ A and B of this article.

http://scholarship.law.missouri.edu/mlr/vol39/iss2/1
situations because those activities are not entered into by the great mass of mankind, and they do result in extensive injury to percolating groundwater supplies if their waste products are uncontrolled.112

V. Public Nuisance

The concept of public nuisance comprehends threats to the public health, safety, and welfare. Only three percolating groundwater cases have involved an application of public nuisance law. Two involved pollution of individual domestic wells. They were brought by private parties claiming a special damage different in kind and degree from that suffered by the public at large.113 The third involved pollution of a public water supply. It was brought by a public official.114 There are too few public nuisance cases involving percolating groundwater pollution to draw any conclusions from a factual analysis.

VI. Rules Applicable to Underground Streams

It is a commonplace observation that underground streams115 are subject to the same rules as surface watercourses.116 Cases involving pollution of groundwater make the same general observation.117 More to the point, five cases involving groundwater pollution state that riparian rights law is applicable to pollution of underground streams.118 Three of them specifically apply surface watercourse diversion allocation rules to pollution of...
acknowledged underground streams.119

A majority of surface watercourse pollution cases apply private nuisance law instead of riparian rights law.120 Three groundwater pollution cases state that private nuisance law applies to pollution of underground streams.121 However, none applied it to that situation.

With respect to pollution of surface watercourses, I concluded from an analysis of virtually all American, English and Irish pollution cases (445 cases) that "riparians have a legal right to discharge wastes into watercourses, provided the discharge is reasonable with respect to other riparian uses and provided a private or public nuisance is not created or maintained."122 Because an underground stream is a concentration of moving groundwater either easily traceable or ascertainable from the surface or known to the user,123 the problem of being unable to anticipate the effects of

120. See note 84 supra.
122. Davis, Water Pollution Litigation 780.
123. The following groundwater pollution cases have defined an underground stream.

Concentration of moving groundwater: This is my own definition which reconstrues, in a modern hydrological concept, the old common-law definition of an underground stream as encompassing a regular and constant flow within a permanent defined channel.


discharging wastes into an underground stream does not face the riparian as it does the overlying landowner discharging wastes into percolating groundwater. Therefore, there is no reason why the surface watercourse pollution rule stated above should not apply with equal force to pollution of underground streams. The cases are too few to ascertain whether the courts have acted similarly in the two situations.

VII. DEFENSES

A. Comparative Convenience Doctrine

Courts frequently have applied the comparative convenience doctrine de facto to surface watercourse pollution cases, regardless of whether they


From the surface: United Fuel Gas Co. v. Sawyers, 259 S.W.2d 466, 467 (Ky. 1953).


Several hydrologists have argued that there is no such things as an underground stream with a defined channel and definite direction except in rare instances. See e.g., Piper & Thomas, Hydrology and Water Law: What is Their Future Common Ground?, UNIVERSITY OF MICHIGAN LAW SCHOOL, WATER RESOURCES AND THE LAW 7, 10-11 (1958); Tolman & Stipp, Analysis of Legal Concepts of Subflow and Percolating Waters, 21 Ore. L. Rev. 113, 121-24, 130-32 (1942). The correlation between the hydrologic understanding of groundwater movement and the legal concept of underground streams is an important matter which warrants investigation.

124. Davis, Water Pollution Litigation 762-68, 807-09.
formally accept or reject it. They have used it both for determining the reasonableness of a waste discharge under riparian rights law and for fashioning appropriate relief.\textsuperscript{125}

For the most part the doctrine has not been considered by the courts in groundwater pollution cases. Only four percolating groundwater pollution cases have specifically mentioned the comparative convenience doctrine. Three expressly rejected it in favor of private nuisance theory (two of the three granted relief to plaintiff\textsuperscript{126} and the third favored plaintiff\textsuperscript{127}). These cases involved pollution of either domestic or industrial water supplies. The fourth case favorably recited the comparative convenience doctrine in jury instructions which were approved per curiam.\textsuperscript{128}

B. Prescription

A riparian can acquire a prescriptive right against downstream riparians to discharge wastes into a surface watercourse either in abrogation of riparian rights or to maintain a nuisance.\textsuperscript{129} This ought to be true for discharging wastes into groundwater aquifers as against the rights of neighboring landowners.

One percolating groundwater pollution case expressly stated that such a prescriptive right can be acquired, although it did not find that the waste discharger had acquired it.\textsuperscript{130} One other case expressly refused to rule on this question.\textsuperscript{131}

C. Custom of the Industry

Defendants in several negligence cases have asserted that their activities could not be considered negligent because they were following the custom of the industry. The percolating groundwater cases uniformly have rejected that asserted ground for nonliability. The courts point out that the custom itself may be negligent.\textsuperscript{132} Also, in the case of mineral and oil lessees, they

\textsuperscript{125} See generally Restatement of Torts §§ 826-31 (1939).
\textsuperscript{126} Elliott v. Ferguson, 103 S.W. 453, 454 (Tex. Civ. App. 1907) (Q1b), rev'd on other grounds 101 Tex. 317, 107 S.W. 51 (1908) (Q1f*: cemetery allegedly would pollute domestic well); Ballard v. Tomlinson, 29 Ch. D. 115, 127 (C.A. 1885) (per Lindley, L.J.) (D5ab: factory privy wastes discharged into well polluted brewery well).
\textsuperscript{128} Wheeler v. Fisher Oil Co., 6 Ohio N.P. 309, 311, 9 Ohio Dec. 294 (1899) (G1d: oil well salt water discharged into stream percolated to and polluted domestic well).
\textsuperscript{129} Davis, Water Pollution Litigation 758-59.
\textsuperscript{130} Millington v. Griffiths, 30 L.T.R.(n.s.) 65, 67-68 (C.P. 1874) (K1a: gas plant residues polluted domestic well).
\textsuperscript{131} Hodge v. City of Marmaduke,— Ark. ——, 503 S.W.2d 174, 176 (1973).
have pointed out that the mineral owner's right only extends to making reasonable use of as much of the surface as is reasonably necessary to recover the mineral. That interpretation of the mineral owner's right to use the surface does not allow the custom of the industry to be the sole criterion of negligence.

VIII. HYDROLOGIC CONNECTION BETWEEN GROUNDWATER AND SURFACE WATERS

Most eastern states follow either the absolute ownership or "reasonable use" rules in cases involving diversion of percolating groundwater. Both permit non-malicious diversions of percolating groundwater for use on the overlying land without incurring liability. In the general situation not involving streamside wells, those states generally do not recognize the hydrologic connection between percolating groundwater and surface watercourses. Where diversions from an ordinary well (not a high capacity well) reduce the amount of water flowing in a stream or where a stream diversion depletes the percolating groundwater supply, courts in those states tend to deny relief. Only in the few eastern states following the eastern correlative rights rule, which employs a comparative reasonableness test, are the courts likely to recognize the hydrologic connection between percolating groundwater and surface watercourses.

By contrast, most western states utilize the prior appropriation doctrine in allocating percolating groundwater as well as water in surface watercourses. Superimposed on prior appropriation in California and Utah is a so-called "correlative rights" rule which requires pro rata reductions in diversions to total amounts equal to annual recharge of the aquifer. These western states generally recognize the hydrologic connection between percolating groundwater and surface watercourses and have evolved doctrines protecting watercourse subflow and tributary flow.


134. Ten jurisdictions follow the absolute ownership rule: Connecticut, the District of Columbia, Georgia, Illinois, Indiana, Massachusetts, Mississippi, Rhode Island, Vermont and Wisconsin. Twelve states follow the "reasonable use" rule: Alabama, Iowa, Kentucky, Maine, Maryland, Michigan, New Jersey, New York, North Carolina, Ohio, Pennsylvania and West Virginia. See representative citations in Davis, Wells and Streams 233-34 nn.140-41.

135. Id. at 201-03.

136. Id. at 203.

137. Seven states follow the eastern correlative rights rule: Arkansas, Delaware, Florida, Minnesota, Missouri, New Hampshire and Tennessee. See representative citations in id. at 234 n.142. The rule is described at id. at 203-04.

138. Id. at 234.

139. Id. at 204.

140. Id. at 203.

141. Id. at 222-27.
The eastern states would be expected to deny relief when waste discharged into one class of water pollutes a water supply drawn from another interconnected class of water, because they generally refuse to recognize the hydrologic connection. The western states would be expected to grant relief in the same situation because they generally do recognize the hydrologic connection. The eastern cases do not substantiate the expectation—relief is granted frequently—and the western cases do substantiate the expectation.

Two eastern cases do support the “expected” rule. They refused to grant relief for pollution of watercourses by wastes percolating into the watercourse. Both are Pennsylvania cases involving acid mine drainage, and are particularly favorable to the coal mining industry.\footnote{142} The earlier and precedent establishing one of the two has been thoroughly discredited in other jurisdictions.\footnote{143} Both were decided on the basis of riparian rights law and the comparative convenience doctrine; subsequent decisions have limited both to acid mine drainage by gravity flow.\footnote{144} Indeed two other Pennsylvania cases have granted relief for pollution of watercourses by polluted groundwater percolating to them. One granted relief for a public nuisance created by acid mine drainage polluting a public water supply.\footnote{145} The other granted relief to abate a private nuisance created by dynamite manufacturing wastes polluting a domestic and livestock well.\footnote{146}

Three eastern cases, which are not good precedent, have denied relief for pollution of wells by oil well salt water or acid mine drainage discharged into surface watercourses which percolated from it to the wells. One is a per curiam approval of a jury instruction and the basis for decision is not discussed.\footnote{147} In another relief was denied because it was unclear whether the plaintiff owned the land on which the polluted well was located.\footnote{148} In the third, relief was denied because proximate cause was not established.\footnote{149} However, it is not clear that relief would have been denied in these cases if an adequate factual case had been established. Much more important and better precedent is the one eastern case granting relief for wells polluted in the above described manner.\footnote{150} It involved oil well salt water and was based on private nuisance law.

\footnote{143} See citations in Davis, Wells and Streams 221 n.107.
\footnote{149} Panther Coal Co. v. Looney, 185 Va. 758, 40 S.E.2d 298 (1946).
\footnote{150} Cities Serv. Oil Co. v. Merritt, 332 P.2d 677 (Okla. 1958).
GROUNDWATER POLLUTION

The best that can be said about these eastern cases is that the eastern courts may be less reluctant to grant relief where polluted water crosses the boundary from one class of water to another than they are to grant relief for injurious diversions in the same situation.

Three western cases involving pollution of wells by water percolating from a stream into which the waste had been discharged recognized the hydrologic connection and granted relief. The source of pollution in each was different. Two were decided under nuisance law. The other applied negligence law. One such western case denied relief for failure of proof. A western case involving pollution of tributary flow denied a temporary injunction pending trial. Neither of them indicated any reluctance to recognize the hydrologic connection in appropriate pollution cases.

Three cases recognizing the hydrologic connection were decided under surface watercourse allocation law. One involved pollution of an underground stream tributary by a surface watercourse. Another case involved pollution of an underground stream leading from a surface watercourse. Both were decided on the basis of the natural flow theory which is utilized in a small minority of riparian rights states in pollution cases. The third case involved pollution of a well by oil well salt water percolating from a dry creek where it had been discharged. It was decided on the basis of the reasonable use theory which is utilized in the majority of those states.

IX. Conclusion

This article has explored the rules which the courts have used in cases involving pollution of groundwater. Factual and doctrinal analysis reveals several interpretations of the cases.

First, percolating groundwater allocation rules are virtually never used in pollution cases. Instead, courts usually confine their choice to negligence law or private nuisance law.

Second, negligence law usually is applied in two types of situations: (1) It is applied where the polluting activity must be conducted in the particular location because it involves exploitation of a resource located

157. Davis, Water Pollution Litigation 746.
158. Sun Co. v. Gibson, 295 F. 118 (5th Cir. 1923) (Tex.) Dry intermittent streams are considered to be watercourses in the western states.

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there. Oil and gas and mineral recovery operations are typical examples. (2) Negligence law is also applied when the activity normally is not a source of pollution and the pollution which does occur may or may not have been the result of an unforeseeable event. Oil pipelines and gas mains are typical examples.

Third, nuisance law usually is applied in two situations: (1) It is applied when the activity need not be conducted in a particular location (and therefore has no necessary relationship to the land) and it normally is a source of pollution or has a propensity to cause pollution. Oil refineries, gas manufacturing plants and cemeteries are typical examples. (2) Private nuisance law is applied where the polluter refuses to abate a source of pollution once he is notified of its injurious consequences. Negligence law is applied if the polluter either abates the pollution at that time or makes a good faith attempt to abate. But the courts apply negligence and private nuisance law about equally if the polluter merely fails to abate the pollution once he becomes aware of its injurious consequences.

Fourth, the following factors do not affect the choice between negligence and private nuisance law: (1) the classification of plaintiff and defendant as surface owner and mineral interest owner on the one hand and as persons without privity on the other hand; (2) the predominant economic activity in the jurisdiction; and (3) the classification of the injury as being a traditional nuisance or not.

Fifth, strict liability has been imposed in some jurisdictions by case decision or statute, principally with respect to the pollution caused by the mining, oil and gas, and manufactured gas industries.

Sixth, the eastern courts, in percolating groundwater cases, tend to recognize the hydrologic relationship between surface watercourses and groundwater and to grant relief for pollution of one by an activity affecting the other, slightly more often than they do in diversion cases of that type. The western courts generally recognize the hydrologic connection and grant relief in most cases, both pollution and diversion.

These common law rules concerning groundwater pollution are no longer appropriate to the needs of the time. With the demand for use of groundwater growing rapidly, the liability imposed for its pollution should be broadened to the limits presently applied to pollution of surface watercourses. Under no circumstances should the courts continue to permit the creation and maintenance of some nuisances without liability. Today polluting activities which have a necessary relationship to the land, such as mines and oil wells, and activities which do not normally cause pollution, such as a pipeline, are permitted to create a nuisance without liability provided there is no negligence. This is no longer a viable rule. Also, there should be liability even when the polluter promptly abates the source of the pollution upon notice of the injurious consequences of his activity. In many such cases, the effects of the initial pollution may linger...
for years. Liability for nuisance should always be imposed regardless of
the predictability of the pollution and regardless of the relationship of the
polluting activity to its location. Such liability presently exists for polluting
activities affecting surface watercourses and should exist for polluting
activities affecting groundwater.

A polluter should not be absolved from liability just because he may
not be able to anticipate the movement of the polluted groundwater he
created. This defense should not be recognized for several reasons. First, the
hydrology of groundwater movement is much better understood now than it
was when many of the early groundwater pollution cases were decided.

Even though precise mapping of groundwater movement in any particular
location is still expensive, it is within the reach of any major waste
producer which proposes to inject wastes underground. Disposal wells need
porous formations for successful waste injection and the appropriate hydrol-
ogic tests would insure a successful injection well. Therefore, persons deliber-
ately disposing of wastes underground ought to be required to act in
accordance with the information gained by such testing regarding the
movement of the injected wastes and their probable effects on neighboring
groundwater uses. If they do not make such tests, they should be charged
with the information they would have gained had they made them. Second,
it is generally known now that liquids placed on the ground will seep into
the soil and may enter the body of groundwater percolating beneath the
surface. Persons causing groundwater pollution in ways, other than by
deliberate underground disposal, should be charged with such knowledge
and should not be insulated from liability for groundwater pollution by
claiming that they know nothing more about groundwater movement than
was known in 1843 when Acton v. Blundell was decided. Although a

159. Pollution lingered long after abatement of the polluting source in the
following cases: Sinclair Ref. Co. v. Bennett, 123 F.2d 884 (6th Cir. 1941)
(Tenn.) (service station gasoline leak); Alliston v. Shell Petroleum Corp., 143
Kan. 397, 55 P.2d 396 (1936) (deep well injection of oil well salt water);
Spencer v. Derby Oil Co., 140 Kan. 657, 37 P.2d 991 (1934) (oil pipeline leak);
in glue wastes discharged in drainage ditch); Pickens v. Harrison, 151 Tex. 562,
252 S.W.2d 575, modifying 246 S.W.2d 816 (Tex. Civ. App. 1952) (oil well salt
water in disposal pit); Geochemical Surveys v. Dietz, 340 S.W.2d 114 (Tex. Civ.
App. 1960) (oil well salt water in disposal pit); Continental Oil Co. v. Berry, 52

160. The science of hydrology was formulated about 1923 and the current
theory of groundwater movement was first studied extensively about 1940.
O. Meinzer, The Occurrence of Ground Water in the United States (1923);
O. Meinzer, Outline of Ground Water Hydrology, with Definitions
(1928); Hubbert, The Theory of Ground-Water Motion, 48 J. Geol. 785 (1940).

161. The two major groundwater movement testing methods involve (1)
drilling test wells and measuring change of water levels before, during and after
pumping, and (2) injection of tracing dyes or radioactive materials. See Davis,
Wells and Streams 235 n.144 and treatises cited therein.

162. 12 M. & W. 324, 152 Eng. Rep. 1223 (Ex. 1843). This was the first
case to set forth the absolute ownership rule. It relied heavily on the landowner's
inability to determine what happens to water after it seeps into the ground.
particular polluter might still legitimately claim he could not predict particular injurious consequences of his activity, he can no longer claim legitimately that the polluting material vanished from the earth once it seeped beneath the surface. He knows it will go somewhere. Such a defense to nuisance liability is not recognized in surface watercourse and air pollution cases. Groundwater pollution cases should not recognize it either.163

Pollution of a groundwater aquifer may have pervasive effects both in terms of territorial extent and duration. With reliance on our groundwater supplies increasing, the old court-made rules concerning groundwater pollution are no longer adequate. I propose the following basis for liability in groundwater pollution cases.

(1) No person should be permitted to create or maintain a nuisance without liability. A nuisance contemplates traditional types of nuisances, such as pollution of domestic and livestock water supplies, poisoning of the soil and creation of odors affecting habitation or places of work. A nuisance also contemplates a refusal to abate an activity polluting groundwater after notice of substantial injurious consequences has been given.

(2) No person should be permitted to pollute groundwater as a result of a negligent act without liability.

(3) Where groundwater pollution causes an injury which does not constitute a nuisance and is not the result of negligence, liability should be imposed on the basis of the eastern correlative rights rule. This rule employs a comparative reasonableness test. The courts should consider the ability of the polluter to predict the injurious consequences in advance, the degree and duration of the injury, the difficulty of abating the polluting source, the willingness of the polluter to abate to a reasonable extent, and the comparative social and economic utility of the litigants' activities. These factors should affect both liability in the first instance and the degree of liability in the same manner they affect the reasonable use test employed in riparian rights and surface watercourse pollution cases. The advantage of this test is that the calculations which it requires can be adjusted to reflect both improving knowledge about groundwater hydrology and pollution in general and also known local conditions concerning groundwater movement and pollution.164

(4) Strict liability for escape of abnormally dangerous substances should be imposed where considered appropriate under court-made law or by statute.

These rules would restrain pollution of our groundwater resources to a greater extent than the present court-made rules do. They should obviate

163. The most recent tentative revision of the Restatement of Torts would deny liability for non-intentional discharges which create nuisances. RESTATEMENT (SECOND) OF TORTS § 822 (Tent. Draft No. 16, 1970), discussed in text accompanying notes 86-104 supra.

164. This rule is compatible with the rule I proposed for groundwater diversions in Davis, Wells and Streams 236-38.
the need for tight statutory regulation of groundwater use in areas of moderate demand. They would more accurately reflect hydrologic principles. Lastly, they would more nearly equate groundwater pollution law and surface watercourse pollution law and would provide a common standard of behavior for users of the two major sources of water.

APPENDICES
CODINGS FOR CASE CLASSIFICATION APPENDICES

A. Fact situation coding:
1. SOURCE OF POLLUTION
   A: domestic sewage, septic tank, or cesspool
   B: sewage from city sewers
   C: effluent from city treatment plant
   D: domestic waste discharge from industrial plant or other collective source
   E: mining or mine drainage
   F: mine tailings or process washings
   G: oil and brine from oil wells
   H: leaks from refinery, distributor or large user
   I: leaks from pipelines or gas mains
   J: leaks from service stations or small users
   K: gas plant residues
   L: other industrial or chemical wastes
   M: farm animal wastes or feedlot drainage
   N: landfill, dirt or sand
   P: storm drainage
   Q: cemetery
   R: other or not stated

2. RESULTS OF POLLUTION
   1: domestic water supply affected
   2: public water supply affected
   3: livestock water supply affected
   4: irrigation water supply affected
   5: industrial or commercial water supply affected
   6: odors interfered with habitation
   7: odors interfered with industrial or commercial establishment

B. Decision Coding:
1. JUDGMENT FOR PLAINTIFF
   a: damages granted
   b: injunction granted
   c: demurrer, motion to dismiss, or motion for directed verdict overruled

2. JUDGMENT FOR DEFENDANT
   d: not entitled to relief under rule
   e: allegations not proved or causal connection not proved
   f: no damage or abatement achieved
   g: prescriptive right acquired
   h: comparative convenience
   i: procedural error
   j: evidentiary error
   k: other

*: defendant caused pollution

The coding from the above listing is inserted after each case citation in the following appendices. E.g., Cities Serv. Gas Co. v. Eggers, 186 Okla. 466, 98 P.2d 1114 (1940) (Gla). "Gla" means brine from an oil well polluted a domestic well and damages were granted to plaintiff.
APPENDIX A

UNDERGROUND STREAM CASES
(Cases preceded by an asterisk * applied those rules to acknowledged underground streams.)

A. Surface Watercourse Rule

Cases holding that surface watercourse pollution rules govern pollution of underground streams are listed below.

FLORIDA: *Tampa Waterworks Co. v. Cline, 37 Fla. 586, 20 So. 780 (1896) (R2e: bathing pit allegedly would pollute municipal well) (reasonable use).


NORTH CAROLINA: Masten v. Texas Co., 194 N.C. 540, 140 S.E. 89 (1927) (J1c: service station gasoline leak polluted domestic well).

PENNSYLVANIA: *Good v. Altoona, 162 Pa. 493, 29 A. 741 (1894) (B1,3a: city sewage discharged into river polluted domestic and livestock springs fed by underground stream leaving river) (natural flow).

RHODE ISLAND: Rose v. Socony-Vacuum Corp., 54 R.I. 411, 173 A. 627 (1934) (dictum) (H1,3d: gasoline from refinery polluted domestic and livestock well) (reasonable use).

B. Negligence Rule

Cases holding that negligence rules apply to pollution of underground streams are listed below.

CONNECTICUT: Brown & Bros. v. Illius, 27 Conn. 84 (1858) (K5i: gas plant residues polluted industrial well).

C. Nuisance Rule

Cases holding that nuisance rules apply to pollution of underground streams are listed below.

CONNECTICUT: Swift & Co. v. Peoples Coal & Gas Co., 121 Conn. 579, 186 A. 629 (1936) (H7c: fuel oil from dealership travelled through groundwater to basement warehouse).

NORTH CAROLINA: Masten v. Texas Co., 194 N.C. 540, 140 S.E. 89 (1927) (by implication) (J1c: service station gasoline leak polluted domestic well).

TENNESSEE: Love v. Nashville Agricultural & Normal Institute, 146 Tenn. 550, 243 S.W. 804 (1922) (D5b: school sewage discharged into underground channel polluted a medicinal bottling works spring).

APPENDIX B

PERCOLATING GROUNDWATER CASES

A. Percolating Groundwater Allocation Rules

Listed below are cases holding that percolating groundwater allocation rules concerning diversions also govern pollution of percolating groundwater and negligence or nuisance are not mentioned as exceptions to the rule.

1. ABSOLUTE OWNERSHIP RULE

INDIANA: Greencastle v. Hazelett, 23 Ind. 186 (1864) (Q1i: cemetery seepage allegedly would pollute domestic well).

2. REASONABLE USE RULE

None.

3. EASTERN CORRELATIVE RIGHTS RULE

VIRGINIA: Panther Coal Co. v. Looney, 185 Va. 758, 40 S.E.2d 298 (1946) (E1e: acid mine wastes discharged into stream polluted its water and percolation from it polluted domestic well).

4. WESTERN "CORRELATIVE RIGHTS" RULE

None.
5. PRIOR APPROPRIATION RULE

None.

B. Negligence Exception to Allocation Rules

Listed below are cases holding that liability is imposed for negligent activities causing percolating groundwater pollution, and that in the absence of negligence, liability is determined on the basis of the percolating groundwater allocation rules.

1. ABSOLUTE OWNERSHIP RULE

CONNECTICUT: Brown & Bros. v. Illius, 27 Conn. 84 (1858) (K5i: gas plant residues polluted industrial well).
RHODE ISLAND: Rose v. Socony-Vacuum Corp., 54 R.I. 411, 178 A. 627 (1934) (H1,9d: gasoline from refinery polluted domestic and livestock well); Rose v. Standard Oil Co., 56 R.I. 272, 185 A. 251 (1936) (H1,3e: same facts as above).

2. REASONABLE USE RULE

KENTUCKY: United Fuel Gas Co. v. Sawyers, 259 S.W.2d 466 (Ky. 1953) (G1d: gas well leak polluted domestic well).

Pennsylvania abandoned the common law negligence rule in 1954 and since has followed the Restatement rule.

3. EASTERN CORRELATIVE RIGHTS RULE

KENTUCKY: North-East Coal Co. v. Hayes, 244 Ky. 639, 51 S.W.2d 960 (1932) (E1,3d: mining polluted domestic and livestock well) (but see United Fuel Gas Co. v. Sawyers, supra).

4. WESTERN "CORRELATIVE RIGHTS" RULE

None.

5. PRIOR APPROPRIATION RULE

None.

C. Negligence
Listed below are cases applying negligence rules to pollution of percolating groundwater without mentioning application of percolating groundwater allocation rules in the absence of negligence.


MISSISSIPPI: Magnolia Petroleum Co. v. Williams, 222 Miss. 538, 76 So. 2d 365 (1954) (G1.3:e: oil well salt water discharged into disposal pit allegedly polluted domestic and livestock well).


http://scholarship.law.missouri.edu/mlr/vol39/iss2/1
leak polluted domestic well); Reddick v. Pippin, 421 S.W.2d 225 (Mo. 1967) (Cle: sewage lagoon overflow allegedly polluted domestic well).


NEW YORK: Wheeler v. Fisher Oil Co., 6 Ohio N.P. 309, 9 Ohio Dec. 294 (1899) (jury instruction) (Gid: oil well salt water discharged into stream percolated to and polluted domestic well); Sinclair v. Co. v. Keister, 64 F.2d 537 (6th Cir. 1933) (Jia: service station gasoline leak polluted domestic well).

OKLAHOMA: Pine v. Rizzo, 186 Okla. 35, 96 P.2d 17 (1939) (G1a: oil well salt water polluted domestic well); Cities Serv. Gas Co. v. Eggers, 186 Okla. 466, 98 P.2d 1114 (1940) (G1a: oil well salt water discharged into creek percolated to and polluted domestic well); Shell Petroleum Corp. v. Blubaugh, 187 Okla. 198, 102 P.2d 163 (1940) (G3a: salt water from plugged oil well allegedly polluted livestock well); Sheridan Oil Co. v. Wall, 187 Okla. 398, 103 P.2d 507 (1940) (G1,3a: salt water from plugged oil well polluted domestic and livestock well); Harper-Turner Oil Co. v. Bridge, 311 P.2d 947 (Okla. 1957) (G1a: salt water from plugged oil well polluted domestic well); Cities Serv. Oil Co. v. Merritt, 332 P.2d 677 (Okla. 1958) (dictum: as between holders of surface and mineral interests) (G1a: oil well salt water discharged into stream percolated into and polluted domestic well); Sunray Mid-Continent Oil Co. v. Tisdale, 366 P.2d 614 (Okla. 1961) (G1a: salt water from improperly plugged exploratory well polluted domestic well); Norman v. Greenland Drilling Co., 403 P.2d 507 (Okla. 1965) (G3c: salt water from improperly cemented oil well polluted livestock well and spring).


Pennsylvania abandoned the common law negligence rule in 1954 and since has followed the RESTATEMENT rule.


TENNESSEE: Sinclair Ref. Co. v. Bennett, 123 F.2d 884 (6th Cir. 1941) (J1a: service station gasoline leak polluted domestic well).


D. Nuisance

1. PUBLIC NUISANCE

Listed below are cases applying public nuisance rules to pollution of percolating groundwater.


2. PRIVATE NUISANCE

Listed below are cases applying private nuisance rules to pollution of percolating groundwater.

ALABAMA: Kingsbury v. Flowers, 65 Ala. 479 (1880) (Qle: cemetery allegedly would pollute domestic well); Bellevue Cemetery Co. v. McEvers, 168 Ala. 535, 53 So. 272 (1910) (Q1e: cemetery seepage allegedly would pollute domestic well).

ARKANSAS: McDaniel v. Forrest Park Cemetery Co., 156 Ark. 571, 246 S.W. 874 (1923) (Q1e: cemetery seepage allegedly would pollute domestic wells); Hodge v. Marmaduke, — Ark. —, 508 S.W.2d 174 (1978) (C1,3e: treated effluent from city treatment plant allegedly polluted domestic and livestock well).

CALIFORNIA: Carter v. Chotiner, 210 Cal. 288, 291 P. 577 (1930) (Q1,3b: cemetery seepage would pollute domestic and livestock well).

CONNECTICUT: Brown v. Illius, 25 Conn. 583 (1857) (K5a: gas plant residues polluted industrial well); Swift & Co. v. Peoples Coal & Gas Co., 121 Conn. 579, 186 A. 629 (1936) (H7c: fuel oil from dealership traveled through groundwater to basement warehouse); Kostyal v. Cass, 163 Conn. 92, 302 A.2d 121 (1972) (J1a: heating oil storage tank leak polluted domestic well).


ILLINOIS: Ottawa Gas Light & Coke Co. v. Thompson, 39 Ill. 599 (1864) (K1e: gas plant residues polluted domestic well); Wahle v. Reinback, 76 Ill. 322 (1875) (A1b: privy allegedly would pollute domestic well); Rand v. Wilber, 19 Ill. App. 395 (1890) (A1b: privy allegedly would pollute domestic well); Iff v. School Directors, 45 Ill. App. 419 (1892) (D1e: school privy allegedly would pollute domestic well); Phoenix v. Graham, 349 Ill. App. 328, 110 N.E.2d 669 (1953) (dictum) (negligence law applied as between holders of surface and mineral interests) (G1f: salt water leak from plugged oil well polluted domestic well).

IOWA: Fayne v. Wayland, 131 Iowa 659, 109 N.W. 203 (1906) (Q1b: cemetery seepage allegedly would pollute domestic well and spring); Iverson v. Vint, 243 Iowa 949, 54 N.W.2d 494 (1952) (L1a: molasses waste dumped in highway drainage ditch polluted domestic well).

KANSAS: Gilmore v. Royal Salt Co., 84 Kan. 729, 115 P. 541 (1911) (R3e: outdoor salt pile seepage polluted livestock spring and poisoned soil); Helms v.

KENTUCKY: Kinnaird v. Standard Oil Co., 89 Ky. 468, 12 S.W. 987 (1890) (H1,8a: oil tank leak polluted domestic and livestock spring); Miley v. A'Hearn, 13 Ky. L.R. 834, 18 S.W. 529 (1892) (Alb: privy allegedly would pollute domestic well); Livezey v. Schmidt, 96 Ky. 441, 29 S.W. 25 (1895) (M6): manure pile seepage allegedly percolated to house cellar during rains); Louisvile & N.R.R. v. Simpson, 17 Ky. L.R. 959, 33 S.W. 395 (1895) (R1a: buried cow polluted domestic spring); Davis v. Adkins, 18 Ky. L.R. 73, 35 S.W. 271 (Ky. 1896) (A1e: privy allegedly would pollute domestic spring); Rogers v. Bond Bros., 279 Ky. 239, 130 S.W.2d 22 (1939) (L2e: creosote allegedly polluted public water supply well); McCaw v. Harrison, 259 S.W.2d 457 (Ky. 1953) (Q3e: cemetery seepage allegedly would pollute livestock well).

MAINE: Monk v. Packard, 71 Me. 309 (1880) (Q1e: cemetery seepage allegedly polluted domestic well).


MINNESOTA: Berger v. Minneapolis Gaslight Co., 60 Minn. 296, 62 N.W. 336 (1885) (K1a: gas plant fuel oil seepage polluted domestic well); Nelson v. Swedish Evangelical Lutheran Centemry Ass'n, 111 Minn. 149, 126 N.W. 723, petition for reargument denied, 127 N.W. 626 (1910) (Q1c: cemetery seepage allegedly would pollute domestic well).


NEBRASKA: Beatrice Gas Co. v. Thomas, 41 Neb. 662, 59 N.W. 925 (1894) (K1,3f: gas plant residues polluted domestic and livestock well); Lowe v. Prospect Hill Cemetery Ass’n, 58 Neb. 94, 78 N.W. 465 (1899) (Q1b: cemetery seepage allegedly would pollute domestic well); Braasch v. Cemetery Ass’n, 69 Neb. 300, 95 N.W. 646 (1903) (Q1c: cemetery seepage allegedly would pollute domestic well).


NORTH CAROLINA: Clark v. Lawrence, 59 N.C. 83 (1860) (Q1c: cemetery seepage allegedly would pollute domestic well); Masten v. Texas Co., 194 N.C. 540, 140 S.E. 89 (1927) (J1c: service station gasoline leak polluted domestic well).

OKLAHOMA: Clinton Cemetery Ass’n v. McAttee, 27 Okla. 160, 111 P. 392 (1910) (Qle: cemetery allegedly would pollute domestic cistern); Danciger Oil & Ref. Co. v. Donahay, 205 Okla. 390, 238 P.2d 308 (1951) (G1,3a: oil well salt water and refuse discharged into dry stream percolated into and polluted domestic and livestock well); Cities Serv. Oil Co. v. Merritt, 332 P.2d 677 (Okla. 1958) (but negligence law applied as between holders of surface and mineral interests (dictum)) (G1a: oil well salt water discharged into stream percolated into and polluted domestic well).

OREGON: Ex parte Wygant, 39 Ore. 429, 64 P. 867 (1901) (dictum); Ulmen v. Mt. Angel, 57 Ore. 547, 112 P. 529 (1911) (BP1b: sewer and storm drainage polluted domestic well).


Pennsylvania abandoned the common law nuisance rule in 1954 and since has followed the RESTATEMENT rule.

TENNESSEE: Lytton v. Steward, 2 Tenn. Ch. 586 (1876) (D1e: university sewage discharged into natural sink allegedly would pollute domestic spring and well); Reid v. Memphis Memorial Park, 5 Tenn. App. 105 (1927) (Q1e: cemetery allegedly would pollute domestic well).

TEXAS: Jung v. Neraz, 71 Tex. 396, 9 S.W. 344 (1888) (Q1c: cemetery seepage allegedly would pollute domestic well); Dunn v. Austin, 77 Tex. 139, 11 S.W. 1135 (1889) (Q1e: cemetery seepage allegedly would pollute domestic well); Elliott v. Ferguson, 37 Tex. Civ. App. 40, 83 S.W. 56 (1904) (Q1iij: cemetery allegedly would pollute domestic well); Elliott v. Ferguson, 101 Tex. 317, 107 S.W. 51 (1908), rev’d 103 S.W. 453 (Tex. Civ. App. 1907) (Q1i*: same facts as above); Farb v. Theis, 250 S.W. 290 (Tex. Civ. App. 1923) (Q1i: cemetery allegedly would pollute groundwater tributary to stream rendering stream unpotable); Continental Oil Co. v. Berry, 52 S.W.2d 953 (Tex. Civ. App. 1932) (J1i*: service station gasoline leak polluted domestic well); Jones v. Highland Memorial Park, 242 S.W.2d 250 (Tex. Civ. App. 1951) (Q1e: cemetery seepage allegedly would pollute domestic well); Eternal Cemetery Corp. v. Tammen, 324 S.W.2d 562 (Tex. Civ. App. 1959) (Q1e: cemetery seepage allegedly would pollute well).

WASHINGTON: Hite v. Cashmere Cemetery Ass’n, 158 Wash. 421, 290 P. 1008 (1930) (Q1e: cemetery seepage allegedly would pollute domestic well); Haveman v. Beanow, 36 Wash. 2d 185, 217 P.2d 313 (1950) (L1ab: potato processing wastes discharged into pit polluted domestic well); Clark v. Sunset Hills Memorial Park, 45 Wash. 2d 180, 273 P.2d 645 (1954) (Q1e: cemetery seepage might pollute domestic well).


CANADA: Swan v. Adams, 23 Grant Ch. 220 (Ont. 1876) (H1,5i: oil refinery wastes in disposal pit polluted domestic and tannery springs); Hubbs v. Prince Edward County, 8 D.L.R.2d 394 (Ont. 1957) (R1,5ab: sand and salt mixture for de-icing roads polluted domestic and commercial well); British Am. Oil Co. v. Burrill, [1942] Que. K.B. 218 (C.A.) (J1,6a: service station gasoline leak polluted domestic well and caused odors in house).

E. Restatement Rule

Listed below are cases applying the rule described in Restatement of Torts § 822 (1939) to pollution of percolating groundwater.


F. Abnormally Dangerous Substances Rule

Listed below are cases imposing strict liability for the escape of abnormally dangerous substances to pollution of percolating groundwater.

ALABAMA: Killian v. Killian, 175 Ala. 224, 57 So. 825 (1912) (E1e: mine drainage allegedly polluted domestic spring).

ILLINOIS: Ottawa Gas Light & Coke Co. v. Graham, 28 Ill. 73 (1862) (K1a: gas plant gas leak polluted domestic well); Ottawa Gas Light & Coke Co. v. Graham, 35 Ill. 346 (1864) (by implication) (K1a: same facts as above); Decatur Gas Light & Coke Co. v. Howell, 92 Ill. 19 (1879) (K1k: gas plant leak polluted domestic well); Belvidere Gaslight & Fuel Co. v. Jackson, 81 Ill. App. 424 (1898) (K1a: gas plant gas polluted domestic well).

KANSAS: Hall v. Galey, 126 Kan. 699, 271 P. 319 (1928) (G1,3,4a: gas well salt water polluted domestic livestock and irrigation well); Martin v. Shell Petroleum Corp., 133 Kan. 124, 299 P. 261 (1931) (G1,3,5a: oil well salt water polluted domestic, livestock and irrigation well—statutory strict liability); Berry v. Shell Petroleum Co., 140 Kan. 94, 33 P.2d 953 (1934), rehearing denied, 141 Kan. 6, 40 P.2d 359 (1935) (G1a: oil well salt water discharged into drainage canal percolated to and polluted domestic well—statutory strict liability); Rusch v. Phillips Petroleum Co., 163 Kan. 11, 180 P.2d 270 (1947) (G9c: oil well salt water discharged into slush ponds percolated to fresh water aquifer and polluted livestock well and spring—statutory strict liability); Reiserer v. Murfin, 183 Kan. 597, 381 P.2d 313 (1955) (G1,3c: salt water from improperly cased oil well polluted domestic and livestock well—statutory strict liability).


MASSACHUSETTS: Mears v. Dole, 135 Mass. 508 (1883) (R1ab: removal of beach caused sea water to percolate into domestic well).
MINNESOTA: Berger v. Minneapolis Gaslight Co., 60 Minn. 296, 62 N.W. 336 (1895) (K1a: gas plant fuel oil seepage polluted domestic well).

OKLAHOMA: Shell Petroleum Corp. v. Blubaugh, 187 Okla. 198, 102 P.2d 163 (1940) (G5e: salt water from plugged oil well allegedly polluted livestock well).


G. Theory Not Stated

Listed below are cases involving pollution of percolating groundwater where the decisional theory is not stated.

ALABAMA: Pan American Petroleum Co. v. Byars, 228 Ala. 372, 153 So. 616 (1934) (Q1f: service station gasoline leak polluted domestic well).

KANSAS: Spencer v. Derby Oil Co., 140 Kan. 657, 37 P.2d 991 (1934) (II,3a: oil pipeline leak polluted domestic and livestock well); Martin v. Continental Oil Co., 141 Kan. 37, 39 P.2d 917 (1935) (G1,8f: oil well salt water discharged into drainage canal polluted domestic and livestock well); Alliston v. Shell Petroleum Corp., 143 Kan. 327, 55 P.2d 396 (1936) (G1,3a: oil well salt water injected underground polluted domestic and livestock well); Augustine v. Hinnen, 201 Kan. 710, 443 P.2d 354 (1968) (G3a: oil well salt water injected underground polluted livestock well).

MINNESOTA: Sandstone Spring Water Co. v. Kettle River Co., 122 Minn. 510, 142 N.W. 885 (1913) (L2a: creosote discharged into broken sewer polluted bottled water works well).

MISSOURI: Windle v. Springfield, 320 Mo. 459, 8 S.W.2d 61 (1928), transferred from 275 S.W. 585 (Spr. Mo. App. 1925) (B5a: city sewage discharged into cave polluted spring and lake and caused odors).


OKLAHOMA: Darby Petroleum Corp. v. Mason, 176 Okla. 138, 54 P.2d 1046 (1936) (G1,3a: oil well salt water polluted domestic and livestock well and poisoned soil); Shell Oil Co. v. Blubaugh, 199 Okla. 355, 185 P.2d 959 (1947) (G3j: salt water and refuse from plugged oil well polluted livestock well); D-X Sunray Oil Co. v. Billue, 361 P.2d 212 (Okla. 1961) (J1k: service station gasoline leak polluted domestic well).


APPENDIX C
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Sources: Surface Watercourse Pollution—Davis, *Theories of Water Pollution Litigation*, Appendices A-C, 1971 Wis. L. Rev. 738, 783-894. This article does not examine the treatment of pollution under the prior appropriation doctrine and does not examine Canadian cases.

Percolating Groundwater Pollution—Appendix B, *supra*. 
### Table 2

**Analysis of Percolating Groundwater Pollution Cases—Source of Pollution**

*(dicta not counted)*

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*Codings supra at 147*

44
### Disposition of Case

| Source of Pollution | A | B | C | D | E | F | G | H | I | J | K | L | M | N | P | Q | R | Total |
|---------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|
|                     | 9 | 1 | 3 | 3 | 2 | 4 | 7 | 8 | 4 | 1 | 7 | 4 | 55 |
|                     | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 7 | 22 |
|                     | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 17 | 29 |
|                     | 11| 1 | 5 | 3 | 4 | 2 | 5 | 9 | 9 | 5 | 1 | 24 | 4 | 84 |

### Source: Appendix B, supra.
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<td>2</td>
<td></td>
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</tr>
<tr>
<td>(9) Totals</td>
<td>101</td>
<td></td>
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</tr>
<tr>
<td>Plaintiff wins (a-c, e)</td>
<td>52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defendant wins: on merits (d-h) for other reasons (i-k) total</td>
<td>15</td>
<td></td>
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</tr>
<tr>
<td>Total</td>
<td>168</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Appendix B, supra.