

# Environmental Regulation: Fitting the Pieces Together

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## INTRODUCTION

The National Environmental Policy Act (“NEPA”)<sup>1</sup> requires federal agencies to examine the potential environmental impacts of projects before issuing any approval.<sup>2</sup> Anyone who has completed the first year of law school should be puzzled about why there was a need for this law. After all, the law of negligence imposes a duty on everyone to consider the probable consequences of their actions and take reasonable precautions to avoid injury.<sup>3</sup> NEPA requires significantly less than the law of negligence because it is limited to examination of environmental consequences and it does not require precautions to avoid the risks identified. Thus, to understand NEPA we need to understand why Congress chose to impose an obligation already imposed by the common law, and why in doing so, Congress required so much less than is required by the common law.

The same questions we asked about NEPA could be asked about other environmental statutes. For example, the Toxic Substances Control Act (“TSCA”)<sup>4</sup> empowers the Environmental Protection Agency (“EPA”) to regulate chemical substances that “present an unreasonable risk of injury to health or the environment,” but requires that the regulation use the “least burdensome means.”<sup>5</sup> The seller of an unreasonably dangerous product faces common law liability under either negligence or strict products liability and taking the least burdensome precautions would not absolve one of liability. Thus, Congress again imposed an obligation that has a significant overlap with common law obligations, but requires significantly less than the common law.

This article will examine whether there is something unique about environmental consequences that can explain how NEPA, TSCA and other environmental statutes developed and, in particular, the overlaps with common law requirements that appear to require less than is required by the common law. Our discussion of environmental law consequences will help explain a number of elements of environmental law that tend to confuse the regulated community, specifically: (1) the diversity of means used to regulate – we will identify at least nine different means of environmental regulation;<sup>6</sup> (2) significant overlaps that make it common for the same activity to be regulated by more than one statute and (3) gaps – there are a number of areas such as global warming and indoor air, for which one would expect regulation but there is none.

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<sup>1</sup> 42 U.S.C. §§ 4321-4370d (2006).

<sup>2</sup> 42 U.S.C. §§ 4332 requires EPA to “include in every recommendation or report on proposals for legislation and other major federal actions affecting the quality of the human environment, a detailed statement by the responsible official on – (i) the environment impact of the proposed action.

<sup>3</sup> See *infra* notes 11-12 and accompanying text.

<sup>4</sup> 15 U.S.C. §§ 2601-2692 (2006).

<sup>5</sup> 15 U.S.C. §§ 2605 (2006).

<sup>6</sup> See *infra* Part IB.

## I. THE NEED FOR ENVIRONMENTAL REGULATION

Prevention of harm is among the chief goals of negligence law.<sup>7</sup> Negligence law tends to deter risky behavior because it assumes that rational decision makers will take precautions to avoid liability when the cost or burden of the precautions is less than the probable liability.<sup>8</sup> Regulation is aimed at preventing harm more directly, by prohibiting people from, or creating disincentives to, taking certain risks.<sup>9</sup> Regulation to prevent harm will be necessary, however, only when the common law system is not preventing that harm.<sup>10</sup> Thus, to understand the need for environmental regulation, we need to examine why the negligence system was not deterring environmental harm – why, for example, government agencies and sponsors of projects did not realize that potential environmental consequences needed to be examined; why sellers of dangerous chemicals did not recognize the need to take precautions; and why reasonable business people did not realize that the harm caused by pouring poisons into the ground would exceed the burden of taking reasonable precautions with regard to appropriate disposal.

The law of negligence requires people to take reasonable precautions to avoid reasonably foreseeable risks of harm. As the famous *Palsgraf*<sup>11</sup> case indicates, if harm is not reasonably foreseeable, there is no duty owed. The negligence standard of care, the duty element, can be described as a form of risk benefit analysis. As explained by Justice Learned Hand in the *Carroll Towing*<sup>12</sup> case:

the owner's duty, as in other similar situations, to provide against resulting injuries is a function of three variables: (1) the probability that she will break away; (2) the gravity of the resulting injury, if she does; and (3) the burden of adequate precautions. Possibly it serves to bring this notation into relief to state it in algebraic terms: if the probability be called P; the injury L; and the burden B; liability depends upon whether B is less than L multiplied by P.

A number of factors tend to prevent the negligence system from deterring environmental harms. Among them are: (1) environmental harms tend to be

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<sup>7</sup> See Richard Posner, *A Theory of Negligence*, 1 J. LEGAL STUD. 29 (1972); Gary Schwartz, *Mixed Theories of Tort Law: Affirming Both Deterrence and Corrective Justice*, 75 TEX. L. REV. 1801 (1997); see also Christopher Schroeder, *Lost in the Translation: What Environmental Regulation Does that Tort Cannot Duplicate*, 41 WASHBURN L.J. 583 (2002).

<sup>8</sup> See Posner, *supra* note 7; see generally, Schwartz, *supra* note 7 at 1815-16; Schroeder, *supra* note 7, at 587-90.

<sup>9</sup> Schroeder, *supra* note 7, at 589-92.

<sup>10</sup> There is a significant body of literature addressing the theoretical basis of regulation. For a good review of that literature see, Rena Steinzor, *Pragmatic Regulation in Dangerous Times Risk Regulation at Risk*, 20 YALE J. ON REG. 402 (2003) and James Florio, *Congress As Reluctant Regulator: Hazardous Waste Policies In the 1980's*, 3 YALE J. ON REG. 351 (1986).

<sup>11</sup> *Palsgraf v. Long Island R.R. Co.*, 248 N.Y. 339 (1928).

<sup>12</sup> *United States v. Carroll Towing Co.*, 159 F.2d 169, 173 (2d Cir. 1947).

long term and indirect, and are therefore, less foreseeable than many other harms; (2) the effects of environmental harm tend to be spread more broadly over society and thus, even if the overall harm is greater, the harm to each individual “plaintiff” may be small enough to prevent suit; (3) certain environmental harms are subject to greater scientific uncertainty that reduces the likelihood that any prospective plaintiff will connect the cause to the effect and thereby reduces the likelihood of liability; and (4) environmental harm is often the cumulative effect of many unrelated actions, each of which, on its own, appears to be innocent.

Plugging these factors into the negligence analysis, we can see that some affect whether harm is reasonably foreseeable and some affect the risk taker’s analysis of the risks and burdens. Within the area of foreseeability, there are those factors that affect whether *any* harm is foreseeable and those that affect whether this specific harm is foreseeable. Among the factors that affect the balancing of risks and burdens, there are those that affect the risk taker’s judgment regarding whether significant harm will result and those that affect the risk taker’s judgment regarding whether any plaintiff will be able to connect the risk to the harm. Thus, negligence law tends not to prevent environmental harm because environmental harms are less foreseeable, less certain to occur and more difficult to connect to any particular cause.

#### A. *Are Environmental Consequences Unique?*

To determine whether environmental consequences are unique, we will examine several sets of health and safety regulations with regard to the nature of risks being addressed. We will ask the same questions we asked regarding environmental regulation, specifically why did negligence law not prevent the harm the regulations are intended to prevent, and did the regulatory scheme require less than would have been required by the common law?

Why do we need any health and safety regulation? Why, for example, did the law of negligence not prevent the worker safety problems that prompted the need for the creation of the Occupational Safety and Health Administration (“OSHA”), the air safety problems that brought the Federal Aviation Administration (“FAA”) into existence or the drug safety problems that resulted in Food and Drug Administration (“FDA”) regulation?

The central element of the Occupational and Safety Act<sup>13</sup> is the promulgation of safety standards and the acceptance of existing safety standards as regulation.<sup>14</sup> These “standards” are designed to avoid much of the case-by-case

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<sup>13</sup> 29 U.S.C. §§ 651-678 (2008).

<sup>14</sup> See 29 U.S.C. § 651 entitled “Congressional Statement of Findings and Declaration of Purpose and Policy.” See also Robert D. Moran, OSHA Handbook 2-1 (Government Institutes, Inc.), stating “The importance of the Standards to employers is evident from the fact that, of the millions of OSHA citations against them to date, well over 95% of them have alleged the violation of OSHA standards”).

decision making regarding how to balance the risks and the burdens.<sup>15</sup> In other words, Congress concluded that safety could be enhanced by defining for the risk taker when an action is considered to be safe and when it is sufficiently unsafe to warrant a penalty.<sup>16</sup> The OSHA standards are not the result of uncertainty and generally do not define the risk; instead they define how one should proceed in the face of a known risk.

With FAA and FDA regulation as well, the statutes do not come to identify the risk that needs to be responded to. They direct airlines and drug manufacturers how to behave in the face of that risk.<sup>17</sup> As with OSHA standards, the balancing of the risks and burdens is performed for the risk taker by the legislature or the regulatory agency so that the regulated community can proceed with some certainty. Whether these regulations provide greater public safety or balance the risks and benefits in a manner that protects the regulated industry is not our issue. The point is that in each case, the health and safety regulation addresses an identifiable risk by defining in advance when the risk is greater than the burden of precautions and by defining what precautions to take.

A second element common to most health and safety regulation is that there is an identifiable group that is intended to be protected.<sup>18</sup> There is no disagreement about who OSHA is intended to protect – the workers, who FAA regulations are intended to protect – air travelers, who FDA regulations are intended to protect – the consumers of food and drugs.

A third element common to most health and safety regulation is that there is little or no dispute regarding where to place the burden of precautions. That is, the airlines, the employers and the manufacturers have the burden of taking precautions regarding FAA, OSHA and FDA regulations, respectively.<sup>19</sup> Thus, most health and safety regulation defines the duty owed by an identifiable group of people to avoid a known risk of harm that is directed toward an identifiable group of potential victims. In other words, we know who is intended to be protected, from what risk, and how.

NEPA is different from most health and safety regulation with regard to each of these factors. NEPA is based on a lack of understanding of what the potential consequences of government action are.<sup>20</sup> Without that basic understanding of

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<sup>15</sup> See *Louisiana Chemical Ass'n. v. Bingham*, 657 F. 2d 777 (5th Cir. 1981) (explaining that the purpose of standards is to address specific risks of harm).

<sup>16</sup> 29 C.F.R. § 1910 (2008). (“Standard” means a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment).

<sup>17</sup> For example, 14 C.F.R. pt 23 (2008), “Airworthiness Standards” contains a series of rules that the FAA imposes based on the FAA’s determination of what is reasonably safe. See also “*A Brief History of the Federal Aviation Act*,” available at <http://www.FAA.gov/about/history> (last visited November 1, 2008); and John Swann, “*History of the FDA*,” available at <http://www.FDA.gov/oc/history> (last visited November 1, 2008).

<sup>18</sup> See *supra* notes 14-17 and accompanying text.

<sup>19</sup> *Id.*

<sup>20</sup> See *infra* notes 25-26 and accompanying text.

the potential consequences, it is very difficult to reach agreement regarding what risk is being addressed, who needs to be protected from that risk, which party should have the burden of precautions and, how to balance the risks and the burdens. The Toxic Substances Control Act (“TSCA”), as we will see, shares some of the differences between NEPA and the other health and safety regulations we described. The lack of understanding of the potential consequences is present. There may, however, be both an identifiable set of parties at risk (users or purchasers) and an identifiable set of parties to regulate. Thus, not all environmental regulation contains all of the factors that we identified as unique to environmental regulation. We will see that which factors are present will have an impact on the means of regulation.

In sum, what makes environmental regulation different from other regulation is the level of uncertainty – an uncertainty that starts with uncertainty regarding the consequences of actions. With that uncertainty as a starting point, all the other elements of a negligence claim can become uncertain. That is not to say that negligence fails to prevent environmental harm because we never know what risk we are attempting to prevent. As described above, there are other factors that contribute to the failure of the negligence system to prevent the harm. For each type of environmental regulation, we will see that one or more of the above factors is subject to significant uncertainty and the means of regulation chosen will depend on which factor is the subject of the uncertainty.

### *B. The Means of Regulation*

Environmental consequences include impacts on air, water, soil, plants, animals, and people. Impacts on people include impacts on human health, aesthetics, noise, and traffic. This broad scope of environmental consequences helps explain the breadth of the means chosen to regulate. For example, if virtually all activities have potential environmental consequences, it may make more sense to regulate the consequences (do not cause x) than to follow the more typical pattern of regulation (do not do x). At the same time, there should be certain activities that create such a risk of harm that they need to be specifically regulated. Thus, within environmental law we have both regulation of consequences and activities. This creates considerable overlap between programs because actions that are regulated by one program often have consequences that are regulated by other programs whose goal is to regulate specific types of consequences.

Act-based regulation is the more common method. That is, many regulatory schemes feature command and control type regulation that prohibits certain actions or requires certain actions. The desire for specific results (e.g. water quality standards), however, creates the need for a different means of regulation. Permit systems are a common feature of the attempt to reach certain results because the legislation can require a permit for certain activities and then, taking into account factors that are specific to the site – the actor, the receiving media,

etc. – the agency can decide what limits should apply to this person's activities at this specific location.

The desire to reach specific results (clean air, clean water, etc.) has led to a considerable amount of regulatory experimentation. Examples that will be discussed herein are technology-based regulation (e.g. new sources of air emissions must use the best available control technology) and cap and trade systems that use market driven incentives to try to reach particular goals.

Additionally, many environmental statutes are informational; they require that a person obtain certain environmental information or provide information to others, rather than prohibiting specific actions or seeking specific goals.<sup>21</sup> In such cases, the statute is reacting to the uncertainty of consequences and what one does with this information is then often left to regulated party. The assumption is that if the failure was lack of information, then the only regulation required is one that requires the gathering or dissemination of information.

Environmental regulation uses at least nine different means of regulation: (1) require someone to gather information; (2) require someone to perform an action deemed to be protective of the environment; (3) prohibit actions deemed to be harmful to the environment; (4) prohibit certain actions, except pursuant to a permit obtained from a government agency; (5) require the regulated party to meet certain limits on quantity or concentration of emissions; (6) require use of a certain "standard" of technology for pollution prevention; (7) require that water, air or soil be "cleaned" to meet a certain standard; (8) provide for civil liability even if there are no prohibitions or required acts; and (9) market-based incentives such as the trading of emissions credits. This article will discuss each of these means of regulation as specific statutes and regulations are discussed in Part II below.

### C. A Simple Illustration

To illustrate how the nature of the uncertainty can help determine the means of regulation, we will examine a simple example in which the negligence system did not deter a harm-causing activity. Assume that there have been several slip and fall accidents in a corporate cafeteria. From a negligence perspective, slippery floors in a cafeteria would probably be a foreseeable risk that could be avoided by taking reasonable precautions.<sup>22</sup> Management, playing the role of regulator, needs to understand the underlying risk in order to craft a rule that will prevent future injuries. If management believes that the underlying risk is based on lack of awareness that the floors are slippery, management may

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<sup>21</sup> See discussion *infra* of NEPA, TSCA and RCRA.

<sup>22</sup> Slip and fall issues have been much litigated. Many cases are collected in the following articles: C.C. Bjorklund, *Slip and Fall Due to Foreign Substances on Floor*, 28 AM. JUR. 2D 167; R.D. Hursh, Annotation, *Liability of Proprietor of Store or Similar Business Premises for Injury from Fall on Floor Made Slippery by Tracked-in or Spilled Water, Oil, Mud, Snow and the Like*, 62 A.L.R. 2d 6 (originally published 1958).

respond by requiring the posting of caution signs. Caution signs reduce the risk of injury by making sure that those who need to take precautions are aware of the risk. If lack of foreseeability is the cause, then a regulation that requires someone to provide information is a reasonable response.

If caution signs are not solving the problem, there needs to be further analysis of the underlying risk. In this case, the risk takers who could be regulated include the workers who have slipped, the users of liquids (i.e. the cause of the wet floors) and those who decided that this type of floor surface was appropriate for a cafeteria. To determine the appropriate regulatory response, the regulator must decide what action needs to be regulated. Rules regarding handling of liquids may be a reasonable regulatory response if the handling of liquids is deemed to be the cause. On the other hand, if further examination determines that so many people are using liquids that wet floors are inevitable, then a regulatory response that addresses the users of liquids would not be appropriate and perhaps injuries could be best eliminated by requiring that the floor be a material that does not become slippery when wet. Thus, we see that different answers to the question of what caused the negligence system to fail to prevent the harm leads to different answers to the question of what type of regulation should be made.

## II. EXAMINATION OF SPECIFIC STATUTES

With this background, we can start to examine specific environmental regulatory programs. The first question to be asked about a statute or regulation is why it was needed – what problem was identified that needed a regulatory response. The second is: Which of the reasons listed above is the reason the negligence system failed to prevent this harm? Third, we will examine how the answers to the first two questions shape both the substance of the regulation and the means chosen to regulate.

### A. *The National Environmental Policy Act*<sup>23</sup>

NEPA was the first major environmental regulatory program.<sup>24</sup> It requires federal agencies to examine environmental impacts when making decisions regarding major federal actions.<sup>25</sup> The scope of the term “environment,” when determining what impacts to examine, is very broad and includes many issues

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<sup>23</sup> 42 U.S.C. §§ 4321-4370 (2006).

<sup>24</sup> See Jerry Anderson, *The Environmental Movement at Twenty-five*, 26 RUTGERS L.J. 395, 396 (1995) and Aaron Ehrlich, *In Hidden Places: Congressional Legislation that Limits the Scope of the National Environmental Policy Act*, 13 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 285 (2007) (referring the NEPA as the “the birth of the American environmental legislative revolution.”).

<sup>25</sup> 42 U.S.C. § 4332 (2006) requires government agencies to “include in every recommendation or report on proposals for legislation or other major environmental actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on – (i) the environmental impact of the proposed action.”

that would ordinarily not be viewed as environmental, such as traffic and noise.<sup>26</sup> NEPA is procedural; it requires agencies to examine impacts but does not require agencies to avoid or mitigate environmental impacts.<sup>27</sup> Instead, NEPA gives agencies broad discretion to do what they want with the impact information they gather.

The first issue we need to address is the identity of the problem to which NEPA was a response. The legislative history of NEPA indicates that the country was facing a wide array of environmental problems and Congress recognized that most of these problems were manmade.<sup>28</sup> The legislative history specifies lack of information regarding the possible consequences of government actions and the lack of coordination among government agencies as key contributors to this problem, stating: "Government agencies can and do adopt courses that appear to conflict with the general public interest" and "we do not know the consequences of our actions until it is too late."<sup>29</sup> The legislative history also attributes the failure to identify the consequences of actions to lack of expertise.<sup>30</sup>

Thus, Congress was primarily concerned with the inability to foresee long term indirect consequences, but was also concerned that there was such diversity of impacts that it may be difficult to trace a cause to an effect. Additionally, Congress recognized the presence of scientific uncertainty. Where this combination of uncertainties exists, information gathering is a reasonable regulatory response.

Note that there is no indication in the legislative history that the failures that Congress was reacting to were related to a failure to properly weigh the risks and the benefits of proposed action. From a deterrence perspective, there was every reason to believe that someone with the appropriate information would make appropriate decisions. This helps explain the fact that the law requires an information gathering procedure, but not any particular substantive result.

Other important elements of NEPA include: the preliminary determination of whether a proposed action is type one (likely to have significant impacts) or type

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<sup>26</sup> See, e.g., *Hanly v. Kleindienst*, 471 F.2d 823, cert. denied, 412 U.S. 908 (1973) (noting that effects on traffic, parking and noise should be examined).

<sup>27</sup> See *Stryker's Bay Neighborhood Council, Inc. v. Karlen*, 444 U.S. 223 (1980) ("the only role for the court is to ensure that the agency has considered the environmental consequences."). See also *Robertson v. Methow Valley Citizen's Council*, 490 U.S. 332 (1989) (holding that the NEPA provision that requires consideration of mitigation measures is not a substantive mandate).

<sup>28</sup> H.R. REP. NO. 91-378 (1969), reprinted in 1969 U.S.C.C.A.N. 2751, 2753. Stating "By land, sea, and air, the enemies of man's survival relentlessly press their attack. The most dangerous of all these enemies is man's own undirected technology. The radioactive poisons from nuclear tests, the runoff into rivers of nitrogen fertilizers, the smog from automobiles, the pesticides in the food chains, and the destruction of topsoil by strip mining are examples of the failure to foresee and control the untoward consequences of modern technology."

<sup>29</sup> *Id.* at 2553-54, 2556.

<sup>30</sup> *Id.* at 2756, discussing the complexity of the problems and the need to retain qualified experts.

two (not likely to have significant impacts),<sup>31</sup> and the regulations that provide a lengthy and detailed list of potential impacts to be examined.<sup>32</sup> These can be explained in the same manner as the impact statement requirement. If the problem was that agencies lacked the ability to foresee environmental problems, then specific, detailed assistance regarding how to examine environmental impacts (i.e., how to foresee the problems), was needed.

One key element of NEPA that appears not to be based on lack of information is the element that voids agency actions taken in violation of NEPA.<sup>33</sup> While this requirement appears to be more closely related to the balancing of the probability and gravity of injury and the burden of precautions, it really underscores the importance of the information gathering process. In identifying the extent of the problem and making its statement of policy, Congress took the position that examining environmental impacts is so vitally important that the likelihood and gravity of the harm that can result from actions taken without environmental review are so great as to always justify taking precautions by gathering the information. Thus, action taken without gathering the information is void because Congress has performed the balancing of the burdens for the agencies and decided that the risk is always great enough to justify an examination of the impacts.

Another way to look at this provision is to say that Congress anticipated that the risk takers – government officials – would underestimate the risks involved in not examining impacts. Such officials could have reasoned as follows: NEPA is merely procedural, it requires the gathering of information, but does not require that I do anything with the information other than consider it. Because I could, with impunity, ignore the information and ignoring the information is, from an environmental protection perspective, the same as not gathering the information, I should be able to, with similar impunity, not gather the information.

Congress anticipated this and created a rule that does not permit individual

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<sup>31</sup> 40 C.F.R. § 1501.4 (2008).

<sup>32</sup> Section 1502.16 lists the following eight types of consequences that shall be included: (a) direct effects and their significance (§ 1508.8), (b) indirect effects and their significance (§ 1508.8), (c) possible conflicts between the proposed action and the objectives of Federal, regional, State and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned. (See § 1506.2(d).), (d) the environmental effects of alternatives including the proposed action. The comparisons under § 1502.14 will be based on this discussion, (e) energy requirements and conservation potential of various alternatives and mitigation measures, (f) natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures, (g) urban quality, historic and cultural resources, and the design of the build environment, including the reuse and conservation potential of various alternatives and mitigation measures, and (h) means to mitigate adverse environmental impacts (if not fully covered under § 1502.14(f)).

<sup>33</sup> Section 102 of NEPA, 42 U.S.C. § 4332 states “Congress authorizes and directs that to the fullest extent possible...all agencies of the Federal Governments shall...” The provision was described by Senator Jackson, the bills principal sponsor as “action forcing.” *Hearings on S. 1075, S. 237 and S. 1752 Before the Senate Committee on Interior and Insular Affairs*, 91st Cong., 15 CONG. REC. 40416 (1969).

government officials to balance the risks and the burdens of the information gathering activity, even though the balancing of the risks and burdens of the ultimate government action (e.g. to build the project) was left solely in the hands of these same officials. This fear that agencies would ignore NEPA was borne out by subsequent litigation. For example, in *Calvert Cliffs' Coordinating Committee v. U.S. Atomic Energy Commission*,<sup>34</sup> the court accused the Atomic Energy Commission of making a mockery of NEPA.

To sum up, Congress determined that the cause of many environmental problems was that agencies often did not know the consequences of their actions until it was too late. Examination of the reasons that negligence often fails to prevent or deter environmental harms indicated that several of the reasons were present and all related to the difficulty in anticipating environmental consequences. To overcome these problems, Congress imposed a duty on government agencies to gather information regarding environmental impacts and use it in their decision-making. Because the problem was not failure to properly balance the risks and the burden, Congress did not require that precautions be taken.

### B. Endangered Species

The key elements of the Endangered Species Act<sup>35</sup> ("ESA") are: the prohibition of "taking" of endangered or threatened species,<sup>36</sup> and the requirement that agencies avoid taking actions or permitting actions that injure the habitat of endangered species.<sup>37</sup> The ESA also includes procedures for determining whether a species should be listed as endangered,<sup>38</sup> a requirement of coordination among agencies and a permitting process for the "incidental" taking of endangered species.<sup>39</sup>

The legislative history of the ESA<sup>40</sup> describes the problem not only in terms of loss of species, but also in terms of the failure of earlier legislation.<sup>41</sup> The

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<sup>34</sup> *Calvert Cliffs Co. Inc. v. U.S. Atomic Energy Comm.*, 449 F.2d 1109, 1117 (D.C. Cir. 1971). The Atomic Energy Commission had interpreted the NEPA § 102 requirement that the detailed statement regarding environmental impacts "accompany the proposal through the existing agency review process" to mean to physically accompany the proposal, without every requiring that it be read or considered.

<sup>35</sup> 16 U.S.C. §§ 1531-1543 (2006).

<sup>36</sup> Section 9 of the ESA, 16 U.S.C. § 1538, lists prohibited acts. Section 1538(a)(1)(B) makes it unlawful to "take any such species."

<sup>37</sup> Section 7 of the ESA, 16 U.S.C. § 1536, requires agencies to "use their authorities in furtherance of the purposes of this Chapter" and to "insure that any action authorized . . . is not likely to jeopardize the continued existence . . . or result in the destruction or adverse modification of habitat."

<sup>38</sup> Section 4 of the ESA, 16 U.S.C. § 1533, requires the Secretary of the Interior to "determine whether any species is a threatened or endangered species."

<sup>39</sup> Section 10 of the ESA, 16 U.S.C. § 1539, provides the procedure for incidental take permits.

<sup>40</sup> S. REP. NO. 93-307 (1973), *reprinted in* 1973 U.S.C.C.A.N. 2989, 2990-93.

<sup>41</sup> *Id.* (discussing the Endangered Species Preservation Act, Pub. L. No. 89-669, 80 Stat. 926

ESA's predecessor, the Environmental Species Conservation Act, took an indirect approach to species protection. It attempted to protect species by banning activities that provided an economic gain for those taking endangered species, such as transportation and sale of certain wildlife.<sup>42</sup> By 1973, Congress recognized that "the rate of extinction has increased to where, on average, one species disappears per year."<sup>43</sup> Congress recognized that "it is in the best interests of mankind to minimize the loss of genetic variations."<sup>44</sup> Because the earlier legislation contained a listing procedure and banned commerce in endangered species, the ESA recognized that lack of information about what species were endangered was not at the core of the problem. The problem, Congress concluded, was human activity that impacts species indirectly, for example activities that affect critical habitat.<sup>45</sup> Thus, from the perspective of why negligence did not prevent the harm, harm to species was known and those who knew of the harm were already prevented from trafficking in endangered species. The problem was that people did not recognize the connection between indirect activities and endangered species. Thus, EPA had to draw that connection for people by addressing habitat issues.

Based on the above, the central prohibition of the ESA is "taking" which is defined broadly to include "harm" along with the more familiar terms "hunt, shoot, wound, kill, trap."<sup>46</sup> "Harm" is defined to include acts that cause "significant habitat modification."<sup>47</sup>

From a negligence perspective the failure to protect species is related to a combination of factors. First, injury to protected species is not likely to injure any individual more than others. Thus, the likelihood of there being a plaintiff with standing to complain is low.<sup>48</sup> There is also an important foreseeability problem. That is, the effects of habitat change on species are often long term and indirect. Thus, Congress needed to require the gathering of information to draw the connection between cause and effect that risk takers and injured parties might not otherwise see. Congress also saw a problem with the balancing of the risks and the benefits. Specifically, the risk of a lawsuit is low because no specific individual is injured by loss of species.

Congress set up a system that addressed both problems. First, the ESA contains provisions that require information gathering and agency coordination,

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(1966) and Environmental Species Conservation Act, 91 Pub. L. No. 135, 83 Stat. 275 (1969)).

<sup>42</sup> See S. REP. NO. 91-526 (1969), reprinted in 1969 U.S.C.C.A.N. 1413, 14-16.

<sup>43</sup> 1973 U.S.C.C.A.N. at 2990.

<sup>44</sup> H.R. REP. No. 93-412, pt. 4-5 (1973), quoted in *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 178 (1978).

<sup>45</sup> *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 179 (1978). ("Congress was informed that the greatest [cause of extinction] was destruction of natural habitats); See Rudy Lachenmeier, *The Endangered Species Act of 1973: Preservation or Pandemonium?*, 5 ENVTL. L. 29, 31 (1974).

<sup>46</sup> 16 U.S.C. § 1532 (2006).

<sup>47</sup> 50 C.F.R. § 17.3(c) (2008).

<sup>48</sup> See *Lujan v. Defenders of Wildlife*, 504 U.S. 555 (1982).

similar to NEPA, because many people were not aware that actions affecting habitat could lead to extinction. Second, unlike NEPA, where the lack of information could be solved by merely gathering information, here, lack of information combined with the need to affect the substantive balance, so that the Congressional response was the prohibition of actions that cause harm to species. To comply, people would need to examine the likely outcome of their actions and agencies would need to build an examination of habitats into their environmental assessments. Then, if the impact on habitat is found, Congress has performed the balancing of the burdens and determined when precautions should be taken.

Regulators sometimes provide for private rights of action and sometimes provide only for governmental enforcement. The difference is often based on whether private plaintiffs are likely to exist. The ESA has no private right of action because there is no one who, as a practical matter, is likely to benefit from it and thus, the existence of a private right of action would not likely contribute to the balancing of the risks in which a risk taker engages. In other areas, Superfund for example, the private right of action is important because people know that neighboring site owners and other responsible parties have a significant interest in enforcement.

One of the advantages of a negligence analysis that is difficult to replicate by regulation is the case-by-case analysis, which takes into account the fine distinctions between cases that make the law more fair and more responsive to policy concerns. A blanket prohibition loses those advantages. That is why, with many environmental programs, there is a permit system that allows individual circumstances to be taken into account. Section Ten of the ESA<sup>49</sup> contains a limited permit system for “incidental takes.” It allows the agency to permit takings for scientific purposes or where the taking is incidental to some lawful act.<sup>50</sup> Thus, even where Congress has performed the balancing of the burdens on a nationwide basis, Congress recognized that there may be times when that balancing does not apply, and allowed for exceptions in the form of “incidental take” permits.

To sum up, what was the problem addressed by the ESA? It was a combination of an error in the substantive balancing and lack of information. The result is a set of requirements, some of which are intended to require the gathering of information and other of which prohibit specific actions. To retain the benefits of a negligence system, while including a blanket prohibition, the act includes a permit process to allow case-by- case analysis.

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<sup>49</sup> 16 U.S.C. § 1539 (2006).

<sup>50</sup> An applicant for a permit must submit a conservation plan that specifies the likely consequences of the proposed taking and the steps to be taken to minimize those consequences. Additionally, before a permit can be issued, the plan must be published in the Federal Register. 16 U.S.C. § 1539(a)(2)(A) (2006).

The Supreme Court's decision in *Tennessee Valley Authority v. Hill*<sup>51</sup> ("TVA v. Hill"), illustrates how courts use a negligence type analysis even in the most environment-friendly ESA decisions. The TVA was close to completing the Tellico Dam project and had already spent millions of dollars on construction of the dam,<sup>52</sup> when it was discovered that the dam would injure the habitat of an endangered species of fish called the snail darter.<sup>53</sup> Environmental groups sued to enjoin completion of the dam. The defendant argued for a balancing of the probability and gravity of the risk against the burdens, arguing that the burden that would result from failure to complete the dam, the loss of tens of millions of dollars, outweighs the danger to the snail darter.<sup>54</sup> The Court however, concluded that Congress had taken such calculations out of its hands by determining that the value of endangered species is incalculable.<sup>55</sup> Thus, the little fish defeated the big dam (in the courts)<sup>56</sup> because Congress had altered the balancing of burdens required by a negligence analysis.

### C. Toxic Substances

TSCA<sup>57</sup> and the Federal Insecticide, Fungicide and Rodenticide Act<sup>58</sup> ("FIFRA") are among the easier statutes to fit into our negligence analysis because the statutes are explicit in their use of negligence-based concepts. Both statutes are a response to the same issue – many chemicals in use have never been tested and society was unaware of their safety or toxicity. The Congressional "findings" in section two of TSCA<sup>59</sup> state that:

among the many chemical substances and mixtures that are constantly being developed and produced, there are some whose manufacture, distribution in commerce, use or disposal may present an unreasonable risk

<sup>51</sup> 437 U.S. 153, 177 (1978).

<sup>52</sup> *Id.* at 158 (noting that at the time the injunction was entered, the TVA had spent approximately \$29 million on the project). The district court found that if a permanent injunction were issued, the loss would be between \$53 and \$79 million. *Id.* at 165.

<sup>53</sup> *Id.* at 158-59. The snail darter was a previously unknown species of perch and Little Tennessee River appeared to be its only habitat. The snail darter was formally designated as an endangered species on October 8, 1975 (40 Fed. Reg. 47,505), well after the dam project was begun.

<sup>54</sup> *Tenn. Valley Auth. v. Hill*, 437 U.S. at 169 (1978) ("TVA's position would require the District Court, sitting as a chancellor, to balance the worth of an endangered species against the value of an ongoing public works measure.").

<sup>55</sup> *Id.* at 184 ("The plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, whatever the cost.").

<sup>56</sup> Congress continued to fund the dam and it was eventually completed.

<sup>57</sup> 15 U.S.C. §§ 2601-2692 (2006).

<sup>58</sup> 7 U.S.C. §§ 136-136(y) (2006).

<sup>59</sup> 15 U.S.C. § 2601(a) and (b). FIFRA was first enacted in 1947 and has been amended numerous times since. It does not contain a "findings" section or a statement of policy, but it does contain testing provisions that are similar to TSCA (e.g. § 136 a-1) and a similar standard of care. Compare "unreasonable adverse affects," § 136a(c) (5), "with unreasonable risk" 15 U.S.C. § 2603 (2006).

of injury to health or the environment . . . . It is the policy of the United States that (1) adequate data should be developed with respect to the effect of chemical substances . . . and (2) adequate authority should exist to regulate chemical substances and mixtures which may present an unreasonable risk of injury.<sup>60</sup>

From a negligence perspective, the lack of adequate information about potential harms is the major problem. This is, however, a very different lack of information from the lack of information that led to NEPA. Lack of information about indirect impacts can be resolved by information gathering. Lack of information about direct impacts, on the other hand, suggests a problem with the weighing of the risks and burdens. Thus, unlike NEPA, where Congress concluded that if agencies examine environmental impacts they can be trusted to exercise their discretion with regard to the balancing of the risks and burdens, the lack of foreseeability that resulted in TSCA suggests a different response.

Additionally, the failure of the negligence system in the TSCA case contained additional substantive elements. The importers and manufacturers have a significant economic incentive to underestimate the risks. Many of these chemicals had been in use for many years without resulting in large numbers of product liability or toxic tort suits. This suggests that for some dangerous products, the connection between the danger and the injury was not easy to discern. It may be because many other factors cause the same harm; it may be because of a long latency period. In any case, the lack of plaintiffs meant that even if the product was unreasonably dangerous, the negligence system would not deter the sales. Thus, EPA keeps control of the process to such an extent that the testing protocol must be approved,<sup>61</sup> and EPA determines how the chemical shall be regulated both during and after testing.

Both TSCA and FIFRA give the EPA the power to prohibit the sale of products deemed to be “unreasonably dangerous” or to include limitations on the sale and marketing of such products. This reflects a concern about the balancing of the probability/gravity against the burden of taking precautions. In the ordinary course, the negligence system assumes that a person who is aware of a foreseeable harm will take reasonable precautions, using the balancing of the burdens to determine what precautions are reasonable. In this case, Congress has determined that EPA will perform the balancing of the burdens. Congress probably concluded that even with full knowledge of the risks, the

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<sup>60</sup> This focus on “unreasonable risk” is explicit use of negligence language. Congress went further in explaining the balancing that must be performed requiring the goals of the statute to be carried out “in a reasonable and prudent manner” and requiring consideration of “the environmental, economic and social impact of any action.” 15 U.S.C. § 2601(c) (2006).

<sup>61</sup> 15 U.S.C. § 2603(a)(2) provides “The Administrator shall by rule require that testing be conducted... The provision goes on to provide the means for determining testing protocols.” *Cf.* 7 U.S.C. § 136(b)(2), the FIFRA provision requiring the Administrator to determine what information shall be provided with an application.

disconnect between risk and injury in terms of time and in terms of the existence of other causes, gives the manufacturers and sellers an insufficient incentive to take precautions. Thus, EPA decides whether the risks may outweigh the burden of precautions, comparing the cost of the injuries against cost to the seller of not selling the product.

TSCA and FIFRA are thus, a response to several failures in the negligence system. First, even though one could say that sale of a product without investigation into the potential risks is negligent, the harms that result from chemical products are often latent and difficult to identify. This puts potential negligence defendants in a position in which they could argue “I did not know and did not have the resources to investigate. Thus, the risk was not foreseeable.” Second, even if the risk was foreseeable, the injury to any particular user may be difficult to identify. Thus, the lack of individual plaintiffs or the ability of defendants to defend by pointing out many other causes of the same condition meant that sellers and manufacturers had little incentive to take precautions. Thus, the resulting regulatory scheme has the regulatory agency gathering information, assessing whether the product is unreasonably dangerous and, if it is, prescribing the conditions under which it may be sold.

#### *D. Hazardous Waste Regulation: Resource Recovery and Conservation Act*

The Resource Recovery and Conservation Act (“RCRA”)<sup>62</sup> addresses the problems caused by the improper disposal of waste. The “overriding concern” was “the effect on the population and the environment of the disposal of discarded hazardous wastes – those which by virtue of their composition or longevity are harmful, toxic or lethal.”<sup>63</sup> Congress noted that “approximately 30-35 million tons of hazardous waste are literally dumped on the ground each year” and sanitary landfills,<sup>64</sup> which were designed to comply with local health ordinances, were a major source of pollution.<sup>65</sup> RCRA provides standards for waste generators,<sup>66</sup> for treatment, storage and disposal (“TSD”) facilities<sup>67</sup> and

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<sup>62</sup> 42 U.S.C. §§ 6901-6992k (2006).

<sup>63</sup> H.R. REP. NO. 94-1491(I), *reprinted in* 1976 U.S.C.C.A.N. 6238, 6241.

<sup>64</sup> 1976 U.S.C.C.A.N. at 6249, noting that many of these substances can blind, cripple or kill.

<sup>65</sup> *Id.* at 6248 (“Sanitary landfills, a name often given to dumps for the sake of compliance with local health ordinances will continue to leach pollutants into underground water supplies.”). Additional requirements for generators are provided in the regulations codified at 40 C.F.R. pt. 262 (2008).

<sup>66</sup> 42 U.S.C. § 6922 (2006). The primary obligations of a generator are recordkeeping, labeling, use of proper containers, providing information about the contents to transporters and use of a manifest system. Additional requirements for generators are provided in the regulations codified at 40 C.F.R. pt. 262 (2008).

<sup>67</sup> 42 U.S.C. § 6924 lists seven requirements for TSD facilities. In addition to recordkeeping and reporting, TSD facilities must comply with the standards for TSD facilities set forth in 40 C.F.R.

for government planners.<sup>68</sup> Generators need to identify which of their wastes are hazardous,<sup>69</sup> handle them in a manner that reduces exposure of the wastes to people and the environment,<sup>70</sup> and document proper disposal using a waste manifest.<sup>71</sup> Owners of TSD facilities are heavily regulated through a permit program<sup>72</sup> and EPA sets criteria for municipal solid waste landfills.<sup>73</sup>

From a negligence perspective, rather than identify a problem, Congress identified at least three sets of problems with three independent causes. For generators, it does not appear that there was a lack of information. Waste generators were usually aware of what they were dealing with. The problem seemed to be balancing of the risks and the burdens. Waste generators who were dumping waste on the ground saw the gravity of the perceived risk as low (and therefore any burden to avoid it was too great). In the alternative, the perceived risk of a lawsuit was small because identifying whose waste was at a clean up site could be very difficult.<sup>74</sup>

Congress recognized, however, that the problem was broader than the “dumper.” Even those generators who were segregating their hazardous waste and would never just dump it on the ground, were nevertheless, not taking sufficient steps to make sure it was disposed of properly. The regulatory response, therefore, was to require waste identification and segregation, which makes clear which wastes EPA believes are hazardous. The next part of the regulatory response was special storage and handling requirements, responding to those who might have thought that the risk was low and therefore no precautions were required. Then, a tracking system was instituted, to make sure that those who are aware of the risk and have in-house handling procedures recognize that there is significant risk regarding what happens to the waste when it leaves their facility.

The requirements regarding TSD facilities, primarily a permit program, reflect a special problem regarding the balancing of the burdens. TSD owners and operators should be aware of the risk (they are professional waste handlers) and should be willing to take reasonable precautions, but they face uncertainty

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pt. 264 (2008).

<sup>68</sup> See, e.g., §§ 6296 (authorizing State programs), 6904 (government cooperation), 6907 (solid waste management information and guidelines), 6908 (small town environmental planning) and the regulations promulgated pursuant to these provisions, particularly 40 C.F.R. pt. 258 (2008) – Criteria for Municipal Solid Waste Landfills.

<sup>69</sup> The regulations regarding waste identification and listing are codified at 40 C.F.R. pt. 261 (2008).

<sup>70</sup> 40 C.F.R. pt. 262(C) pre-transport requirements include requirements for packaging, labeling, marking, placarding and accumulation time, sections 262.30-34.

<sup>71</sup> The regulations for the manifest system are at 40 C.F.R. pt. 262(B), §§ 262.20-27.

<sup>72</sup> 40 C.F.R. pts. 264 and 265 (2008). The electronic version of Part 264 available at <http://www.epa.gov> is 320 pages long.

<sup>73</sup> 40 C.F.R. pt. 258 (2008). Criteria are set for location, operation, design, monitoring, closure and financial assurances.

<sup>74</sup> Chemicals in the ground seldom have fingerprints on them.

regarding what precautions are reasonably required. That uncertainty is exacerbated by the fact that the precautions that need to be taken vary with the design of the facility, the substances being handled and local soil and water conditions. This special balancing problem can best be dealt with by a regulatory response that provides general minimum requirements and requires the facility owner to apply for a permit. The regulators, working with the specific information provided by the owner or operator, then determine the procedures and limitations specific to that facility.

The problem with the balancing of risks and burdens addressed by RCRA is different than the problem with the balancing addressed by TSCA and FIFRA. In the case of TSCA and FIFRA, the regulated parties are business entities that are selling a product that may have direct or indirect impacts on users. A TSD facility, on the other hand, is a facility for the treatment, storage or disposal of waste that should understand the risks it is dealing with because its business is dealing with those risks. Additionally, the decision made by the chemical manufacturer can have nationwide or worldwide impacts. The TSD facility has only local impacts. The presence of individual, localized impacts is more suggestive of a permit system, unlike TSCA, where the product has the same effects everywhere and therefore one set of regulations for the substance makes sense.

One of the benefits of a permit system is that it allows the use of regulation without losing some of the positive aspects of the common law system. The common law of negligence permits change to occur as society's values change and as technology changes. What may have been a reasonable precaution can be rendered unreasonable by the development of new technology that makes better precautions less costly. Thus, if regulation simply means command and control, that is, the regulators say, "Do this in this way," there would be a disincentive to finding a better way. A permit system allows for a case-by-case change which in turn allows "reasonable response" to change with the times.

The final element of RCRA, the provisions requiring planning by government agencies, reflects a failure to determine what risks were foreseeable. "Sanitary landfills" tended to leach contaminants into the groundwater. Thus, facilities needed better design and monitoring procedures. Additionally, specialized facilities are necessary and these can be costly. Government planning to make sure that facilities exist is important because it makes no sense to tell generators that they must send their waste to a proper facility and then make no provision to assure the existence of such facilities.<sup>75</sup>

From a negligence perspective, generators had a problem with the balancing of the burdens (undervaluing the risk and overvaluing the burden). Because of this problem, RCRA performs the balancing in some areas by telling generators

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<sup>75</sup> See *supra* note 64 and accompanying text. See also, H.R. REP. NO. 94-1491(I), *reprinted in* 1976 U.S.C.C.A.N. 6238, 6244.

what precautions they must take and by requiring the waste be sent to an appropriate facility.<sup>76</sup> Regarding TSD facilities, RCRA recognizes that differences between facilities may make a case-by-case balancing of the burdens necessary. Thus, the response was a permit system. Finally, RCRA shows an awareness that government agencies lacked information about the risks associated with waste disposal. This foreseeability issue made state and regional planning necessary to make sure the appropriate facilities exist for all types of waste.

### *E. Water Pollution Control*

The concept behind NEPA is that the planning of a project needs to start with an eye toward how that project will affect the environment. Environment is defined broadly to address all types of impacts, from soil, water and air pollution to noise and traffic. Water pollution control legislation, on the other hand, starts with the affected medium and works backward toward the actions that have the greatest impact on the medium. Prior to the Water Pollution Control Act, Congress authorized states to set water quality standards and gave the federal government some limited enforcement powers.<sup>77</sup> From a negligence perspective, this is like starting with a plan to determine what results we want to avoid, and then trying to figure out how to avoid them without first examining the causes or the balance of the burdens. The number of factors that contribute to water quality is so great that starting with a water quality goal and working backward was not feasible. Without understanding the causes of the problem and attempting to address those causes, it is difficult to know what "solution" is realistic.

Congress soon recognized the impracticability of that system and in 1972 passed Federal Water Pollution Control Act Amendments. The legislative history of the amendments discusses the state of water quality, stating, for example that "Many of the nation's navigable waters are severely polluted."<sup>78</sup> The legislative history is sharply critical of the existing regulatory scheme, noting that "More than four years after the deadline for submission of standards, many States have not approved standards."<sup>79</sup> The main thrust of the 1972 legislation was to move the emphasis from water quality standards to effluent

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<sup>76</sup> Note that to the extent that RCRA regulation prescribes what precautions to take, it is performing a function very similar to the OSHA, FAA, and FDA regulations described above.

<sup>77</sup> See S. REP. NO. 92-414, S. REP. NO. 424, *reprinted in* 1972 U.S.C.C.A.N. 3668, 3669-367. The report states that in 1948, Congress authorized the federal government to provide support for State research and technology projects. In 1956, the Congress expanded the support programs. In 1965, Congress required States to "develop standards for water quality with their boundaries." *Id.* at 3669.

<sup>78</sup> *Id.* at 3674 ("Rivers, streams and lakes are still being used to dispose of man's wastes rather than to support man's life and health.").

<sup>79</sup> *Id.* at 3672. The report also noted that "officials are still working to establish a relationship between pollutants and water uses." *Id.* at 3675.

limits.<sup>80</sup> In other words, rather than start with the dirty water and focus on how clean it should be, the new legislation focuses on limiting what pollutants can be discharged to water.

Negligence liability did not deter much water pollution because for most bodies of water, there were so many industries discharging waste that it was very unlikely that any plaintiff could establish whose waste caused what injury. And, for late comers, how could anyone claim that adding more dirt to something filthy caused any harm? The cumulative impact of these multiple sources also made it very difficult to properly balance the risks and the burdens. After all, the thought process would be: my waste is a small contributor so the likelihood of me causing significant harm is small. If everyone thinks that, we end up with a big problem. It therefore makes sense for the balancing to be done by someone with a broader view, such as a regulatory agency.

This combination of multiple causes, but localized individual effects (unlike TSCA where we had multiple causes but nationwide effects) suggests a permit system. The agency can set minimal standards applicable to all and then take the individual circumstances into account with permits. The individual circumstances taken into account include those unique to the facility and those unique to the body of water into which the waste is being discharged.

The 1972 Federal Water Pollution Control Act Amendments also introduced a new means of regulation – technology-based regulation. In addition to the permits and effluent limits, sources of pollution were given time to implement “best practicable treatment technology.”<sup>81</sup> How does a technology-based regulation work? It is worked into the permit process and is a direct attempt to affect the balance of burdens or more precisely to require that industry meet a heavier, more protective burden.

Technology-based regulation responds to a number of the factors we identified as unique to environmental regulation. For example, even where the government is using a permit system to set effluent limits, it may be that implementing the strict limits that will significantly improve water quality may not be feasible at this time. For many facilities, the burden of precautions (the cost of new equipment) may indeed exceed the benefits. But everyone will eventually need to replace equipment. Imposing a greater regulatory burden on new equipment may be feasible. Additionally, stricter regulation can create a market for better equipment. Thus, a permit system, with phased-in technology-based regulation and a continuing obligation to improve the control technology as better equipment becomes available, can be an appropriate solution.

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<sup>80</sup> *Id.* noting that under the new system, water quality will be a measure of performance and not a means of elimination and enforcement.

<sup>81</sup> 33 U.S.C. § 1311(b)(2)(A), reprinted in 1972 U.S.C.C.A.N. at 3676. Based on the statute, EPA has developed a variety of technology based regulations, including best practicable control technology, best conventional pollutant control technology, best available technology and new source performance standards. See 40 C.F.R. pts. 400-499 (2008).

Another element of water pollution control that is worthy of discussion is the significant sums of money that were allocated for the construction and upgrading of publicly owned treatment works ("POTWs").<sup>82</sup> The standards applicable to one who is discharging to a body of water and one who is discharging to a POTW are significantly different.<sup>83</sup> What problem does this address? Since virtually every business is a source of liquid waste, it is clear that every source of liquid waste cannot be required to obtain a permit. The agency does not have the resources to deal with all of the generators. Moreover, there may be small generators of waste to whom the burden of expensive pollution control technology clearly exceeds the risk created. However, taken in the aggregate, the risk created by these businesses may be much greater than the burden of prevention. The solution is an aggregating of liquid wastes in a POTW and placing the primary effluent reduction burden on the POTW. In other words, where multiple causes and cumulative effects were the reason the negligence system did not prevent the harm, moving the balancing of burdens from the individual level to the societal level and placing some of the burden on a POTW can be an effective solution.

To sum up, water regulation started with the result to be reached, a water quality standard, and attempted to work backward toward a means of protection. This was a break from the negligence system because it defined the problem as a result without regard to what caused that result. Congress recognized this system as a problem and switched to a system largely designed to address the causes of water pollution. The problem being addressed from a negligence perspective was the balancing of the burden when the presence of multiple causes combined with the fact that the injury was a cumulative result of many causes made it unlikely that a negligence action would be a significant risk. A permit system recognizes that there is great variation in industrial processes, in chemical effluent and in the receiving waters, so that a case-by-case balancing of the burdens by the agency is better than a rule that tries to perform that balancing on a societal level. Finally, Congress recognized that requiring permits for all possible sources of pollution was not feasible. As we perform the balancing of the burdens, the burden to individual sources would outweigh the risks for many sources; which, in the aggregate, would create a risk that outweighs the burden of precautions. Thus, the special provisions for POTWs address a special need with regard to the balancing of the burdens.

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<sup>82</sup> 33 U.S.C. § 1281 (2006).

<sup>83</sup> 33 U.S.C. § 1311(b)(2)(A) requires EPA to develop effluent limitations for categories and classes of point sources other than POTWs. Section 1317 contains the requirement for pretreatment standards for sources that discharge to a POTW.

### F. Clean Air Regulation

Clean air regulation began much like clean water regulation.<sup>84</sup> Initially the federal government funded state programs that were to set air quality standards. This method of regulation was as unsuccessful in cleaning the air as it was in cleaning the water.<sup>85</sup> The Clean Air Act was amended in 1965 and among the goals was “encouraging regulation of stack emissions and other pollution sources.”<sup>86</sup> The Clean Air Act Amendments of 1970 changed the air emissions regulatory system to include permits, emissions limits, technology-based limits and regional air quality standards. Rather than rehash how each of these was a response to some failure of the negligence system, we will focus on the elements of air regulation that differ significantly from water regulation.

The key elements of the Clean Air Act regulation that differ from water regulation are: regulation based on source category,<sup>87</sup> the permit program that includes emission trading,<sup>88</sup> and the National Ambient Air Quality Standards program that requires State Implementation Plans.<sup>89</sup>

Clean air regulation divides sources of air pollution into two broad source categories: stationary sources and mobile sources. Mobile sources (mainly cars) create as much as 60 percent of the air pollution and provide a number of regulatory challenges.<sup>90</sup> To regulate each car individually would not be feasible. From a negligence perspective, there are several factors at work. First, the same harm is caused by so many similarly situated parties that it would be virtually impossible for a plaintiff to identify a defendant. Second, on a balancing of burdens, the burden on both car owners and regulators would exceed the small incremental harm caused by each unregulated car. Third, car owners do not really control the emissions from their vehicles, so an examination of the most appropriate person on whom to place the burden of precautions indicates that

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<sup>84</sup> See H.R. REP. NO. 88-508, H.R. REP. NO. 508 (1963), *reprinted in* 1963 U.S.C.C.A.N. 1260, 1262-64, describing the existing programs and explaining the need for “a complete revision of the existing law.”

<sup>85</sup> See H.R. REP. NO. 89-2170, H.R. REP. NO. 2170 (1966), *reprinted in* 1966 U.S.C.C.A.N. 3473, 3474-77, describing the need for new legislation; and 1963 U.S.C.C.A.N. at 1266, noting that “Section 5 establishes the manner for abating air pollution. In substance, it is quite similar to the comparable provisions of section 8 of the Federal Water Pollution Control Act.”

<sup>86</sup> H.R. REP. NO. 89-2170, H.R. REP. NO. 2170 (1966), *reprinted in* 1966 U.S.C.C.A.N. 3473, 3481.

<sup>87</sup> 42 U.S.C. §§ 7521-7590 (2006) deal with mobile sources. Stationary sources are addressed by States through their State Implementation Plans (42 U.S.C. § 7410) and by other provisions, including, prevention of significant deterioration (§§ 7470-7511) and § 7411 standards of performance of new stationary sources.

<sup>88</sup> 42 U.S.C. §§ 7661-7666. The regulations for the cap and trade program regarding acid rain are set forth at 40 C.F.R. pt. 75 (2008). EPA has several cap and trade programs. Links to the various cap and trade programs available at <http://www.epa.gov/ehtpages/airairqumissionstrading>.

<sup>89</sup> 42 U.S.C. §§ 7409-7411 (2006). The regulations regarding National Ambient Air Quality Standards are codified at 40 C.F.R. pt. 50.

<sup>90</sup> See 1970 U.S.C.C.A.N. 5361, discussing the need to pay more attention to mobile sources.

significant elements of the burden should be placed elsewhere.

Congress' first approach was to test and certify prototype vehicles.<sup>91</sup> While making clear that the auto manufacturers were in the best position to avoid the harm, this approach failed because such a procedure did not "assure that automobiles coming off the assembly line which are sold to the public comply with the federal emission standards."<sup>92</sup> In terms of negligence and protectiveness, testing prototypes failed to solve the problem because the regulation was not necessarily related to the risk – cleaner prototypes did not necessarily mean cleaner cars on the road.

A second mobile source problem that Congress needed to address was that while regulating the manufacturers could assure that new cars met standards, cars tend to stay on the road for a number of years. Thus, while it made sense to impose the regulatory burden on the manufacturers because of the factors described above, i.e., a small identifiable group of defendants, the manufacturers are in a better position than the car owners to take precautions regarding automobile air emissions, and the precautions taken by manufacturers will have a much greater impact than precautions taken by individual car owners, a new set of problems developed. Because cars on the road for a number of years and after sale are controlled by individuals, manufacturers had little risk of a negligence claim because, to the extent a claimant could identify a source, the manufacturers could point to the owners as the persons in control of the risk-causing instrumentality. Thus, Congress needed to impose a burden on both the manufacturers and the individual owners. The annual inspection system was the response to this issue.

One of the most innovative portions of the air permit system is the part that is dependent on emission trading because it depends on market forces to reduce emissions.<sup>93</sup> The system works essentially as follows: the facility permit contains a cap on emissions; companies that reduce their emissions significantly below their cap earn emissions credits that can be bought and sold on the open market, which encourages cleaner air and uses the market for credits to allocate the burden of precautions.<sup>94</sup>

From a negligence perspective, the problem was that major improvements in technology are quite expensive (i.e., the burden of precautions is high). Thus, for many, the burden of precautions exceeded the benefits. Additionally, existing facilities vary in age and efficiency and therefore, an attempt to place

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<sup>91</sup> *Id.* at 5358, noting that the testing of prototypes was not sufficient.

<sup>92</sup> *Id.* at 5361-62, noting that Congress hoped that automobile manufacturers and fuel manufacturers would come together to fight this problem.

<sup>93</sup> EPA's cap and trade programs under Title V have been the subject of much commentary. See, e.g., Brian Potts, *Trading Grandfathered Air – A New Simpler Approach*, 31 HARV. ENVTL. L. REV. 115 (2007); Paul Jaskow & Richard Schmalensee, *The Political Economy of Market-Based Environmental Policy*, 41 J.L. & ECON. 37 (1998).

<sup>94</sup> EPA has a website devoted to explaining its cap and trade programs, available at <http://www.epa.gov/airmarket/cap-trade/index.html>.

the same burden on everyone in terms of a limit on emissions would impose vastly different burdens on people in terms of cost. In this sense, the stationary sources are very different from the mobile sources, where each manufacturer produces a fleet of new vehicles each year and a result oriented burden (specific emissions limits) imposes a similar burden on everyone. The approach chosen for air permits spreads the burden, allowing those who invest in newer, cleaner equipment to recoup some of their costs from those who have not invested in cleaner equipment. In this way, EPA shifts the balance of the burdens to encourage fewer emissions and reduces overall risk by spreading the burden of precautions.

National Ambient Air Quality Standards (“NAAQS”)<sup>95</sup> and National Emission Standards for Hazardous Air Pollutants (“NESHAPS”)<sup>96</sup> require EPA to look at air pollution as not one problem, for which we can balance the burden of precautions on a societal level and then allocate that burden to individuals or corporations, but as a group of problems for which there may be a group of solutions. NAAQS exist for six pollutants: carbon monoxide, ozone, lead, nitrogen oxide, sulfur dioxide and particulate matter.<sup>97</sup> States are required to submit State Implementation Plans explaining to EPA how they intend to regulate air pollution in order to meet the NAAQS.<sup>98</sup> The 1990 Clean Air Act Amendments listed 189 hazardous air pollutants for which EPA is to create emissions standards.<sup>99</sup> The standards are to be based on Maximum Achievable Control Technology (“MACT”). Among the factors EPA is required to consider in determining MACT is cost.<sup>100</sup>

Congress recognized that there are several important air pollution problems that are not necessarily addressed by the stationary source permit system. With regard to the NESHAPS, Congress recognized that certain individual substances create their own individual health problems and therefore merit their own separate regulations. Additionally, because people in the same industry tend to use the same chemicals and processes, the NESHAPS regulations impose industry-based standards. This is the converse of the permit system. Permits are needed to take the individual characteristics of the facility into account. An

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<sup>95</sup> 42 U.S.C. § 7409 (2006) requires the creation of nationwide standards for air quality. The EPA is to create standards “to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in ambient air.” 42 U.S.C. § 7409(b)(2) (2006).

<sup>96</sup> 42 U.S.C. § 7412 (2006). The NESHAP’s apply to pollutants that are not emitted by enough sources to justify inclusion in the NAAQS.

<sup>97</sup> See 40 C.F.R. pt. 50 (2008).

<sup>98</sup> 42 U.S.C. § 7410 (2006). States have a great deal of freedom to establish their own programs. For an example, see New York’s SIP, published at 40 C.F.R. § 52.1670 (2008).

<sup>99</sup> 42 U.S.C. § 7412(b) (2006). EPA was to develop a list of categories and subcategories of sources and then develop standards for these industry sources.

<sup>100</sup> 42 U.S.C. § 7412(d), stating “Emissions standards . . . shall require the maximum degree of reduction in emissions of hazardous air pollutants . . . taking into account the cost of achieving reduction.”

industry-based standard can address a chemical or a process across an entire industry. It thus puts less of a burden on the regulators.

To some extent, negligence will not deter the harm resulting from such processes for reasons similar to the reasons the permit system was needed. However, because there is a more identifiable defendant and the potential defendants are more similarly situated, a less burdensome set of regulations will suffice.

It is also important to note what technology-based regulations do to the regulated party's burden of precautions. An individual company may not be negligent if, despite emitting hazardous chemicals, the burden of precautions exceeds the potential harm. Additionally, in a competitive industry, an individual party may reasonably conclude that incurring the costs of precautions and attempting to raise prices to cover the costs will not work, because competing products will be less expensive. When Congress places a burden on the entire industry, however, it changes the result of the balancing of the risks and the burdens, because it may now be reasonable for all to incur the costs of precautions and to then increase the prices.

The technology-based approach also fits in with EPA's goal to gradually alter the balance of the burdens. This approach has several advantages over an approach where a specific emission limit is imposed. Because of differences in processes and in the scope of regulated parties' operations, the burden of meeting a numerical goal can vary greatly from party to party, thus threatening the survival of some business entities. Additionally, a numerical goal does not encourage innovation. Once one can meet the goal, one has little incentive to improve the control technology. A technology-based system encourages innovation because today's best available control technology is not likely to be tomorrow's. This system recognizes that as long as one is emitting hazardous air pollutants, they have a need to improve – they have not fully satisfied their obligations to society.

### G. Superfund

The Superfund Law<sup>101</sup> is the federal response to inactive hazardous waste sites. These are sites at which hazardous substances were released or disposed of in the past, but at which there are not necessarily any ongoing activities for the government to regulate.<sup>102</sup> Section 9607, the basic liability provision, provides that four categories of parties are liable for response costs at inactive hazardous waste sites: (1) the present owner or operator of the facility;<sup>103</sup> (2) the

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<sup>101</sup> 42 U.S.C. §§ 9601-9675 (2006).

<sup>102</sup> See e.g., H.R. REP. NO. 96-1016, pt. 1, at 6119-23 (1980). See also Senator Stafford, *Why Superfund was Needed*, EPA Journal, June 1981, available at <http://www.epa.gov/history/topics/cercla>.

<sup>103</sup> 42 U.S.C. § 9607(a)(1) (provides, in relevant part: "Notwithstanding any other provision or rule of law, and subject only to the defenses set forth in subsection (b) of this section – (1) the owner

person who owned or operated the facility at the time of the release or disposal;<sup>104</sup> (3) a person who arranged for disposal of hazardous substances at the facility;<sup>105</sup> and (4) a person who transported waste to the facility.<sup>106</sup> Liability is strict, as well as joint and several.<sup>107</sup>

The problem addressed by EPA was that these sites present a significant risk to human health and the environment, but many sites were old and the responsible parties were no longer in business while other sites had numerous contributors. Why were the companies who disposed of the hazardous substances not deterred by the negligence system? To a large extent, the issue was one of foreseeability. The practices that caused this problem had long ceased by the time Superfund became law. Some of the sites could be attributed to individual parties. Most of the largest sites, however, were a vast mixture of chemicals, many of which caused diseases that were not easily traced to any source and many of which caused harms that existed in the community independent of the chemical wastes.

Thus, negligence law did not prevent the improper disposal of hazardous substances for a group of reasons: the regulated parties did not foresee the harm; the distance in time between the release of the hazardous substance and the harm meant that tracing the harm to the actor was difficult and many could not be found; and some sites were the cumulative result of otherwise harmless activities while other sites the result of interactive effects that could not be predicted. The regulatory response was a liability system, not regulation.

Instead of requirements that must be met and regulatory penalties for failure to meet them, the law simply imposes liability on certain parties. The owner of the property is a responsible party and can be required to remediate without regard to whether the owner acted or failed to act in any manner related to the presence of the contamination. Thus, to the extent it regulates, Superfund does so by imposing liabilities that create an incentive to perform certain types of activities. EPA did not perform the balancing for the regulated party as it did in TSCA and FIFRA. It did not define a standard of care as much command and control regulation does. It merely determined that certain parties are liable for

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and operator of a vessel or a facility . . . shall be liable”).

<sup>104</sup> *Id.* at (a)(2) (provides, “any person who at the time of disposal of any hazardous substance owned or operated any facility at which such hazardous substances were disposed of”).

<sup>105</sup> *Id.* at (a)(3) (provides, “any person who by contract, agreement, or otherwise arranged for disposal or treatment, or arranged with a transporter for transport for disposal or treatment, of hazardous substances owned or possessed by such person, by any other party or entity, at any facility or incineration vessel owned or operated by another party or entity and containing such hazardous substances”).

<sup>106</sup> *Id.* at (a)(4) (provides, “any person who accepts or accepted any hazardous substances for transport to disposal or treatment facilities, incineration vessels or sites selected by such person, from which there is a release, or a threatened release which causes the incurrence of response costs, of a hazardous substance”).

<sup>107</sup> See Alan Topol and Rebecca Snow, *Superfund Law and Procedure* (West 1992) at §§ 4.2 and 4.4, citing numerous cases.

certain things that occurred in the past.

Superfund Law has had a major impact on real estate transactions because an “owner” is a liable party and a lender may become an owner or may be viewed as an operator. Purchasers and lenders therefore need to perform a site investigation in order to avoid becoming liable for the remediation. Thus, nearly everyone purchasing property now incurs the cost of an investigation that is intended to identify potential Superfund liability because the potential cost of liability created by Congress greatly exceeds the potential costs of the precautions.

In what way does this liability act like regulation? Prior to the Superfund, there may have been little ability to foresee risk of liability.<sup>108</sup> The Superfund Law created the risk of liability and now informs prospective owners of the risk. This imposes a duty to take precautions. It does not, however, define the precautions. That is left to individual judgment.

The regulated community was very uncomfortable with having a potential liability without any regulatory guidance regarding how to avoid the liability. As a result, Congress created an exclusion from Superfund liability for persons who took title to property without knowledge of the hazardous substances as long as they engaged in “all appropriate inquiry.”<sup>109</sup> “All appropriate inquiry” was not defined so individual parties had to balance the risks and the regulated community insisted on more certainty. Several attempts have been made to define “all appropriate inquiry.” In 2002, Congress passed legislation requiring EPA to define “all appropriate inquiry.” This legislation created an interim definition.<sup>110</sup> EPA has, since then, published two final rules defining “all appropriate inquiry,”<sup>111</sup> each of which provide a detailed step by step investigation process.

Thus, the liability system created by Congress, created a potential liability about which many in the regulated community did not have sufficient information to avoid the harm. The regulated community then claimed to be unsure of what steps were needed to avoid liability, i.e. what level of investigation was appropriate. EPA came back with a step-by-step description of what actions must be performed to avoid liability. From a negligence perspective EPA initially created a liability system that informed the regulated parties of the need to take precautions, leaving the regulated community to determine which precautions are reasonable. The regulated community was

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<sup>108</sup> There may or may not have been a foreseeable risk of injury, but that element of foreseeability is not relevant in the Superfund scheme.

<sup>109</sup> 42 U.S.C. § 9607(q)(1)(A)-(viii)(I) (2006).

<sup>110</sup> Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. No. 107-18, 115 Stat. 2536.

<sup>111</sup> Standards and Practices for All Appropriate Inquiries, 40 C.F.R. pt. 312 (2008), 70 Fed. Reg. 66,069, 66,072-74 (2005) (discussing the history of the rule). The rule superseded the prior rule that was published at 68 Fed. Reg. 24,888 (2003).

unhappy with this and EPA has since performed the balancing of risks and burdens for the regulated community by providing a detailed description of how to perform an investigation.

#### H. Greenhouse Gas Emissions and Indoor Air

The federal government has no regulatory program for greenhouse gasses or indoor air.<sup>112</sup> However, if the above description of why regulatory programs are created is correct, then the same analysis that explains why the above regulatory programs exist should explain why there is no regulatory program in these areas. Such an analysis should be helpful in supporting our thesis regarding the connection between the negligence system and the environmental regulatory system.

There is currently no environmental regulatory system related to the greenhouse gasses that are generally thought to be a cause of global warming.<sup>113</sup> This may be because Congress has not recognized the problem or has not devised a strategy for dealing with it. From EPA's perspective, it may be that EPA has not yet accepted the idea that global warming is either attributable to human activity or that human activity can prevent global warming. The Supreme Court's decision in *Massachusetts v. Environmental Protection Agency*<sup>114</sup> helps explain the lack of such a regulatory system.

Several states and environmental groups initiated litigation against EPA to require a rulemaking to regulate greenhouse gas emissions from motor vehicles.<sup>115</sup> EPA's reasons for denying the petition included: (1) "a causal link" between human activity and global warming "cannot be unequivocally established"<sup>116</sup> and (2) if the problem exists, it is probably so large a problem that it requires a comprehensive program, not ad hoc regulation.<sup>117</sup> The Supreme Court disagreed and required EPA to regulate this area, reasoning that scientific community was in near total agreement that the problem exists and that the problem is sufficiently related to human activity such that regulation can make a difference.<sup>118</sup>

Scientific uncertainty is at the heart of the problem. The harm has not yet

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<sup>112</sup> In a notice of proposed rule making dated July 11, 2008, EPA explained the difficulties involved in attempting to regulate greenhouse gases.

<sup>113</sup> EPA does support voluntary action to reduce greenhouse gasses. EPA's programs in support of such reductions are described at [www.epa.gov/climatechange](http://www.epa.gov/climatechange).

<sup>114</sup> 549 U.S. 497 (2007).

<sup>115</sup> *Id.* at 1446. Plaintiffs alleged, among other things, that EPA had an obligation to regulate greenhouse gasses because greenhouse gasses are "air pollutants" as that term is defined in 42 U.S.C. § 7602(g) (2006).

<sup>116</sup> *Id.* at 1451, (quoting a report by the National Research Council).

<sup>117</sup> *Id.* at 1450, "EPA concluded that climate change was so important that unless Congress spoke with exacting specificity, it could not have meant the agency to address it."

<sup>118</sup> *Id.* at 1455-58. It is interesting to note that regarding remedy, the Court recognized that regulation would not prevent the injury; it would, at best, mitigate or delay the injury.

occurred and there is no guarantee that it will or what form it will take. Negligence cases start with the harm. If there is no harm there is no claim. Regulation, on the other hand, can work to prevent harm before it happens. The question, however, is how much certainty about the potential harm do we need in order to regulate. From a negligence perspective it begins as an argument about whether any injury is foreseeable, with EPA taking the position that risk is not reasonably foreseeable and therefore there is no need to take precautions. However, EPA's claim that there was no proof that failure to regulate will cause global warming is more properly seen as a problem with the balance of the burdens. Plugging this into the Learned Hand formula,<sup>119</sup> EPA argued that the probability of injury related to our actions is low (causal connection has not been proved) and the burden is very high, so that the burden of precautions outweighs the probability times the gravity (even though the gravity is very high). The Court, on the other hand, sees the gravity of injury as so great that regardless of the probability and the burden, there is a need to take precautions.

Thus, there is no regulatory program for greenhouse gasses because EPA's analysis concluded that the probability times the gravity is less than the burden (based on the low probability), that is, EPA has not identified a failure in the negligence system. There is likely to be such a program because the Supreme Court has reexamined this equation and determined that there is a failure in the system, a failure in the balancing of the burdens, and the government must take action to establish where those burdens should appropriately fall.

Indoor air is a different sort of problem than global warming. EPA has studied indoor air and has issued a number of indoor air guidance documents.<sup>120</sup> The closest there was to a systematic regulation of indoor air was by OSHA, who published a draft indoor air standard in the federal register in 1994<sup>121</sup> and withdrew it after receiving public comment.<sup>122</sup> The preamble to the proposed rulemaking indicates that indoor air is a group of problems that are not all related to each other. The attempt to regulate indoor air was an attempt to regulate diverse subjects such as cigarette smoking; biological contaminants (such as mold), chemical contaminants and odors. Some indoor air problems are caused by activities in the building, while others are caused by problems with

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<sup>119</sup> See *supra* note 12 and accompanying text.

<sup>120</sup> See A portion of EPA's website is devoted to indoor air, <http://www.epa.gov/ehtpages/airindoorairpollution.html> (last visited November 1, 2008). The introduction to this website states: "Since most people spend a majority of their lives indoors, the quality of indoor air is a major area of concern for the EPA. Sources of indoor air pollution include oil, gas, kerosene, coal, wood, and tobacco products, and building materials and furnishings such as asbestos-containing insulation, damp carpets, household cleaning products, and lead-based paints. Through its Indoor Environments Division, the EPA provides hotlines, publications, outreach and other initiatives to improve the quality of air in our homes, schools and offices."

<sup>121</sup> 59 Fed. Reg. 15,968 (April 5, 1994).

<sup>122</sup> 66 Fed. Reg. 64,946 (December 17, 2001).

the ventilation system.<sup>123</sup> In withdrawing the notice, OSHA stated that cigarette smoking was being regulated by states and the other areas of concern did not receive much public comment. Therefore, it would "devote its resources to other projects."<sup>124</sup>

From a negligence perspective, what happened? OSHA thought it had identified a foreseeable risk that was not being dealt with by the negligence system. OSHA studied the problem and discovered that the issue was not being dealt with by the negligence system because the probability of harm multiplied by the gravity of the harm were too small to justify the burdens that would be imposed by regulation. In other words, the negligence system was working fine and there was no need for a regulation to either shift the balance or place greater emphasis on the potential harm than people already were.

### CONCLUSION

Environmental regulation affects nearly all businesses. The range of topics covered and the means of regulation vary so greatly that business people often view it as a confusing mess. The purpose of this article was to cut through the confusion and explain that each element of the system can be understood by reference to some failure of the negligence system to prevent the harm. We have examined the seven major environmental programs with regard to the problem addressed, the cause of the problem in terms of the negligence system and how the regulatory response, both the means of regulation and party subject to the regulation are determined by an understanding of the cause of the problem within the negligence system.

We began the article by illustrating how regulations develop by using a simple slip and fall case. The same analysis, when applied to environmental regulation, helped to explain at least nine distinct types of regulation: (1) require someone to gather information; (2) require someone to perform an action deemed to be protective of the environment; (3) prohibit actions deemed to be harmful to the environment; (4) prohibit certain actions, except pursuant to a permit obtained from a government agency; (5) require the regulated party to meet certain limits on quantity or concentration of emissions; (6) require use of a certain "standard" of technology for pollution prevention; (7) require that water, air or soil be "cleaned" to meet a certain standard; (8) provide for civil liability even if there are no prohibitions or required acts; and (9) market-based

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<sup>123</sup> The preamble stated that more than 1200 comments were received from interested parties and that, the comments dealt with operation of heating, ventilating and air conditioning systems, lack of source control, and worker training.

<sup>124</sup> 66 Fed. Reg. 64,946, stating "Withdrawal of this proposal will also allow the Agency to devote its resources to other projects. The Agency's current regulatory priorities, as set forth in the Regulatory Agenda, include a number of important occupational safety and health standards. This document does not preclude any agency action that OSHA may find to be appropriate in the future."

incentives such as the trading of emissions credits. That list does not exhaust the universe of means used by regulators. It should, however, illustrate that any means is an attempt to reach the same goal, the avoidance or reduction of risk of harm in the most efficient and effective manner.

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