

General Deterrence of Environmental Violation:

A Peek into the Mind of the Regulated Public



State of Oregon
Department of
Environmental
Quality



GENERAL DETERRENCE OF ENVIRONMENTAL VIOLATION: A PEEK INTO THE MIND OF THE REGULATED PUBLIC*

EXECUTIVE SUMMARY

State environmental agencies have long experimented with non-enforcement initiatives like technical assistance and education. While these efforts appear successful in motivating people and businesses to comply, many remain skeptical about their effectiveness in motivating compliance compared to enforcement tools. The United States Environmental Protection Agency developed a National Performance Measures Strategy designed to incorporate and compare the different kinds of enforcement and non-enforcement tools, but the measures do not provide conclusive comparison because they do not consider indirect deterrence effects. This study is designed to look at those indirect effects.

Two surveys were executed to assess the deterrent effect of inspections and enforcement as administered by Oregon's Department of Environmental Quality (DEQ). One survey was given to 300 randomly-selected Oregon residents throughout the state. A second survey was given to 450 Oregon companies having permits or registrations with DEQ.

Data show that most companies place a high value and priority on environmental compliance. Companies demonstrate this priority by considering environmental impacts during initial concept design of new processes, by assigning environmental responsibilities high in the company hierarchy, and by making process changes to ensure compliance with new laws or for environmental reasons. Although most companies appear proactive and self-motivated, DEQ plays a significant role in stimulating that motivation.

First, DEQ's inspection and penalty process creates specific deterrence. Eleven percent of the companies that recently made management, production, or operation changes involving environmental issues did so because of direct DEQ enforcement. Furthermore, once penalized, companies were more likely to seek permits and modifications, request technical assistance, make process changes for environmental compliance, and involve upper management in disciplining staff when environmental violations occur.

Second, the assistance and enforcement processes also create general deterrence. During the last three years, 38% of the companies surveyed made changes as a result of hearing about DEQ inspections, 33% made changes resulting from hearing about DEQ's technical assistance efforts, and 14% made changes resulting from hearing about DEQ penalties against other firms. Deterrence theory suggests that to be effective, an enforcement program must create certainty of detection, severity of penalty, and celerity (promptness) of enforcement action. DEQ appears successful in creating these factors:

- (1) Most companies (70%) believe DEQ would almost definitely discover significant violations and 41% believe DEQ would even find out about less significant violations.

* Prepared by Les Carlough, Ph.D., J.D., Senior Policy Advisor, Office of Compliance and Enforcement, Oregon Department of Environmental Quality, 811 SW 6th Avenue, Portland, Oregon, 97204-1390 (ph. 503-229-5422).

- (2) Most companies (70%) believe they cannot save significant money through noncompliance because the risk of exposure and negative publicity is great. However, companies tended to be less concerned with the monetary penalty than other possible effects of enforcement, and expressed most concern about forced shut-downs, environmental damage, criminal prosecution, corporate reputation, community pressure and customer pressure. Those concerns are well placed; 65% of Oregon residents say they would stop or reduce buying from a company that was taking action that is bad for the environment.

But, these motivators do not apply equally to all companies. In particular, small companies – especially very small companies – have very different beliefs and concerns. Small companies are less likely to work to assure compliance, less likely to belong to organizations that promote environmental compliance, less likely to have made recent environmental changes, and less likely to request technical assistance. Although small companies say the pressure of monetary penalties has a tremendous impact on them, they are less likely to be aware of DEQ compliance and enforcement efforts. For this reason, current enforcement efforts to create deterrence are likely less effective with small companies. Part of the reason for the difference may be because small companies do not have sufficient personnel or time to devote to environmental compliance. Finding the most effective mix of regulatory mechanisms to stimulate small companies to comply will continue to be a challenge. However, it is clear that both technical assistance and enforcement must be integrated.

Technical assistance, inspections and penalties have far-reaching effects that stimulate compliance at companies that were neither inspected nor penalized. For each two changes a company makes because of direct technical assistance, one other company hears about the assistance and also makes a change. For each change a company makes because of direct inspection, other companies hear about the inspection and make about one and a half changes. For each change a company makes because of a direct penalty action, other companies hear about the penalty and make about three changes. On average, during the last three years, DEQ's efforts at technical assistance directly generated an average 2.2 changes per company in manufacturing, production or operation processes with an additional 1.1 changes made by companies that did not receive the assistance but later heard about the technical assistance through other means. During the same three years, DEQ's inspection and penalty efforts directly generated an average 1.6 changes per company with an additional 2.6 changes made by companies that later heard about the inspection or penalty. Inspections by DEQ directly stimulated 19% and indirectly stimulated another 28% of the total changes motivated by DEQ action. This far exceeds the 2% motivated by direct penalty action and 7% stimulated by indirect penalty action. However, it is unclear to what extent the fear of penalty contributed to decisions to make changes directly or indirectly resulting from inspections or technical assistance.

While deterrence is critical to the success of many programs, it can only work when companies perceive a risk of enforcement. Because some groups of companies do not perceive that risk and are therefore not deterred from violating, DEQ may wish to evaluate whether there is a need to improve the means in which companies are informed about their enforcement risk. This issue may become especially important as regulatory agencies shift from a focus on larger industrial sources of pollution to the smaller, more-numerous, ephemeral and diffuse sources. In addition, deterrence may not be a useful strategy in solving all problems. Some areas where deterrence is unlikely to be the most effective primary strategy include: (1) violations resulting from unclear regulatory requirements, (2) violations resulting from companies taking reasonable risk, and (3) motivation of companies to adopt environmentally-protective behavior above that required by law.

INTRODUCTION

Current Regulatory Focus on Enforcement

In their efforts to administer pollution-control laws, the U.S. Environmental Protection Agency and its counterpart state agencies have tended to employ command-and-control type strategies with a focus on inspections and enforcement. Policymakers generally assume that enforcement is the most critical regulatory tool because penalties “deter” future violations. However, agencies generally lack sufficient information to determine whether enforcement is the best foundation for a compliance program compared to other kinds of activities, and how enforcement should be implemented to best take advantage of a deterrent effect.

Like many states, Oregon’s Department of Environmental Quality (DEQ) uses a compliance strategy that includes both enforcement and non-enforcement tools. Its permit and facility inspection programs and complaint-response investigation programs involve enforcement to create deterrence. But DEQ also uses various non-enforcement cooperative efforts to build relationships with entities in the regulated community. Depending on the type of program and the amount of interaction with the facility, DEQ believes these efforts can create compliance in a less expensive and less adversarial manner than enforcement. It also believes that through these efforts, it can contact people who would probably not otherwise receive attention and stimulate environmentally protective behavior above and beyond that required by law.¹

Not everyone agrees on what the appropriate mix of enforcement and non-enforcement tools should be.² Environmental groups typically suggest that environmental agencies should increase enforcement.³ Business interests are typically concerned that enforcement is unnecessarily

¹ See Keiner, Suellen, Brenda Hagman and Bernard Penner, *Environmental Compliance Consortium’s Response Compass*, ECOSTATES, pg 24-29 (summer 2001) (describing how states, like Oregon, integrate various enforcement tools (e.g., administrative and civil enforcement, criminal prosecution) with non-enforcement tools (e.g., warnings, technical assistance, public education, sectoral outreach, voluntary programs, amnesty programs, performance assistance, and economic incentive programs)).

² DEQ published an article in an industry journal explaining the enforcement process and the steps a company should take in an enforcement action. Les Carlough, *DEQ Enforcement: Facts v. Fiction*, Oregon Insider, Issue #167, Dec. 15, 1996, at 1. An anonymous industry representative published a criticism in the journal suggesting that DEQ should conduct a cost-benefit analysis of the dollars spent by DEQ, state lawyers, state police, district attorneys, and the court systems to see if the penalties collected justify the expense of taxpayer-funded enforcement. *DEQ Enforcement: A Response*, Oregon Insider, Issue #167, Jan. 1, 1997, at 6. This drew a second criticism from a public-interest environmental attorney, who doubted that DEQ’s enforcement is sufficient to deter noncompliance. Craig N. Johnston, *DEQ Enforcement Criticism Critiqued*, Oregon Insider, Issue #168, Jan. 15, 1997, at 7. DEQ responded in a follow-up article suggesting some factors anyone trying to measure deterrence should consider. Les Carlough, *DEQ Enforcement: In Perspective*, Oregon Insider, Issue #169, Feb. 1, 1997, at 5.

³ See, e.g., Coequyt, John and Richard Wiles, *Prime Suspects: The Law Breaking Polluters America Fails to Inspect*, Environmental Working Group (July 25, 2000) available at www.ewg.org (“EPA has lost control of environmental law enforcement, and in the absence of strong federal oversight many states have gutted enforcement programs.”) Also, Oregon Environmental Council; *Holding Polluters Accountable: Strategies for Strengthening Enforcement of Environmental Laws in Oregon*, March 2002 (concluding that Oregon’s illegal polluters are not deterred because they do

aggressive, but have sometimes opposed technical assistance efforts fearing that larger companies will pay a disproportionate share of the costs and that state-supplied assistance is unfair to companies that spend their own resources to attain compliance.⁴ EPA has been cautious about supporting technical assistance which may draw resources away from enforcement programs. As a result of these conflicts, state environmental agencies have had difficulty obtaining full acceptance of technical assistance efforts⁵ – enforcement has remained the primary regulatory tool and the numbers of enforcement cases and penalties assessed remain a primary measure of success.

It is clear that enforcement numbers and counts do not show whether a particular mix of tools is the best at improving compliance in the regulated public or whether the mix creates the best environmental return for the dollars spent. EPA, in exercising its oversight of state programs, increasingly acknowledges the value of non-enforcement tools,⁶ but insists that states maintain an aggressive enforcement presence.⁷

Shifting to an Integrated Approach

In 1997, EPA developed a National Performance Measures Strategy (NPMS) to address current trends in government that obligate agencies to (1) manage resources with results-based strategies and

not face certainty of getting caught, that penalties are too low, and that there are insufficient other incentives to encourage compliance).

⁴ E.g., VOLOKH, ALEXANDER AND ROGER MARZULLA, REASON FOUNDATION, ENVIRONMENTAL ENFORCEMENT: IN SEARCH OF BOTH EFFECTIVENESS AND FAIRNESS, Policy Study no. 210 (Aug. 1996) (concluding that enforcement penalties as currently applied are ineffective and inappropriate); Anonymous contributor, *DEQ Enforcement: A Response*, *Oregon Insider*, Issue #167, Jan. 1, 1997, at 6 (stating that DEQ's enforcement program is unnecessarily aggressive and creates "fear and major damages to employment;" and that in other regulatory systems "there is a sense of working together to solve the problem, lowering the cost to all, and getting better long-term results for the environment").

⁵ Currently, technical assistance is not recognized as part of the federally delegated hazardous waste program and the state is not credited for resulting increases in compliance or waste reduction from these efforts. The Oregon Legislature recently instructed DEQ to negotiate with EPA for the purpose of gaining acceptance of technical assistance as a part of the delegated hazardous waste program. Senate Bill 196, 72nd Legislative Assembly, regular session (2003).

⁶ Compare, Steve Herman, *Message from the Assistant Administrator*, in ANNUAL REPORT ON ENFORCEMENT AND COMPLIANCE ASSURANCE ACCOMPLISHMENTS IN 1999, OFFICE OF COMPLIANCE AND ENFORCEMENT (2000) ("The goal of our program is to provide a credible deterrent to pollution and greater compliance with the law.") with, John Peter Suarez, *Message from the Assistant Administrator*, in ENVIRONMENTAL RESULTS THROUGH SMART ENFORCEMENT: FISCAL YEAR 2002 ENFORCEMENT AND COMPLIANCE ASSURANCE ACCOMPLISHMENTS REPORT, OFFICE OF ENFORCEMENT AND COMPLIANCE ASSURANCE (2003) ("Our goal is to implement a smart enforcement program that delivers environmental results. A smart program uses a mix of integrated strategies, partnerships and innovative approaches to provide cleaner air, purer water and better protected land.")

⁷ Performance Partnership Agreement between the Oregon Department of Environmental Quality and the U.S. Environmental Protection Agency – Region 10 for July 1, 2002 - June 30, 2004, available at www.deq.state.or.us/about/ppa.pdf. (DEQ agrees to conduct inspections to ensure high rates of compliance, track significant non-compliers, evaluate EPA's concern that DEQ's penalties are too low and evaluate EPA's concern that DEQ does not assess sufficient penalties in multiple-violation circumstances.)

(2) demonstrate that agency resources are used efficiently.⁸ The new set of measures was intended to supplement the counts of inspections and penalties and allow credit for work in alternative non-enforcement and incentive-based programs. An important, but unstated goal of the NPMS was to create a means to compare outcomes of the various alternative tools so that agencies could determine which tools were most efficient and effective in achieving the best environmental return.⁹ A problem, recognized during development of the NPMS, is that the environmental benefits of some tools are difficult to quantify.

Performance Measure no. 2 of the NPMS addresses environmental or human health improvements resulting from enforcement actions, but there are significant complexities in how the environmental benefit of enforcement should be measured. Some parts may be relatively simple, for example, the amount of pollution directly deflected from the environment by the requirements of the enforcement action. Some parts may be moderately difficult to measure, for example, the pollution that will be deflected from the environment in the future because the violator will be less likely to violate (*i.e.*, “specific deterrence”¹⁰). Some parts may be essentially impossible to measure, for example, the pollution that will be deflected from the environment in the future because someone else learns of the enforcement action and is inhibited from violating (*i.e.*, “general deterrence”¹¹). In developing the NPMS, EPA requested comment on how to integrate a measure of deterrence.¹² But a means to measure general deterrence eluded EPA and the agency did not include it in the final strategy. General deterrence – the lynchpin of current national and state environmental regulatory strategy – is not addressed in any way by the National Performance Measures Strategy.

What is Deterrence?

Many intuitively believe that people and businesses tend to comply only to the extent that the personal or business benefits of compliance outweigh the personal and business costs. In this view, people would be willing to take actions that create personal or business benefit when the costs are personally minimized by being diffused or distributed to the greater population.¹³ This perspective bears itself out in areas of our common experience. For example, many people drive to work alone even though we all know that the multitude of cars on the roads creates public problems of clogged highways and increased air pollution. Each driver considers the convenience of having his or her own car available for personal errands to be more valuable than the personal detriment of the one

⁸ US EPA, Office of Enforcement and Compliance Assurance, *Measuring the Performance of EPA’s Enforcement and Compliance Assurance Program: Final Report of the National Performance Measures Strategy* (Dec. 22, 1997).

⁹ See Herman, Steven A., *Innovations in Environmental Enforcement and Compliance*, NATIONAL ENVIRONMENTAL ENFORCEMENT JOURNAL, pg 6 (Feb. 1999).

¹⁰ Nagin, Daniel (1978) General Deterrence: A review of the empirical evidence. In A. Blumstein, J.Cohen, and D. Nagin (eds.), *DETERRENCE AND INCAPACITATION: ESTIMATING THE EFFECTS OF CRIMINAL SANCTIONS ON CRIME RATES*, 95-139, Washington, D.C., National Academy of Sciences.

¹¹ *Id.*

¹² Notice of Public Meeting on the National Performance Measures Strategy for Enforcement and Compliance Assurance, 62 Fed. Reg. 8014-16 (Feb. 21, 1997).

¹³ See, *e.g.*, Hardin, Garrett, *The Tragedy of the Commons*, SCIENCE 162:1243-48 (1968).

added car on the road. For each person, the environmental detriment is small and distributed to the greater public through impacts to shared roads and air. But the aggregate effect of millions of decisions to drive creates rush-hour traffic jams and smog. This has become known as the “tragedy of the commons”¹⁴ and plays itself out in many aspects of environmental management.

How does a government motivate people and businesses to make decisions that avoid these detrimental effects? The current paradigm is that the government must act to “deter” violation by setting laws that require certain conduct, then enforcing those laws by penalizing noncompliance.¹⁵ The penalty becomes a larger personal cost which is not as easily distributed to the greater population. When people make decisions, they consider the risk of penalties and other negative consequences of prior decisions made by themselves or others. Classic deterrence theory holds that, to achieve maximum deterrence, an enforcement program must demonstrate three principles.¹⁶ First, detection and penalty must be *certain* if the illegal conduct is undertaken. Second, the *severity* of penalties must exceed the benefit resulting from the illegal conduct. Third, penalties must be swiftly applied, a factor termed “*celerity*.” The classical theory assumes that a would-be violator must perceive these risks associated with the illegal conduct and react in a rational manner. Whether this model of deterrence governs compliance decisions in the area of environmental law is not well understood.

Despite the lack of supporting evidence and proven reliability of the classic deterrence model as applied to environmental regulation, EPA and its state counterparts created and continue to maintain regulatory programs fundamentally based around the concept that inspections and enforcement are the essential and primary elements needed to stimulate compliance in the regulated public.

OBJECTIVES AND METHODS

The primary objectives of this study were to determine whether and what aspects of inspections, penalties and other enforcement tools are most important in creating general deterrence; and whether general deterrence is the critical factor in stimulating overall compliance.

This study is based on two surveys of the opinions and beliefs of the regulated community. The surveys were designed in cooperation with, and were executed by, the Market Decisions Corporation.¹⁷ The first survey was given to individual Oregon residents to understand community perspectives about compliance, violations and enforcement. By examining public opinion, the study sought to characterize the cultural norms in which regulated entities make their compliance decisions and the possible community pressures that may promote compliance. A second study sought to understand what motivates people and businesses to comply by comparing their awareness of

¹⁴ *Id.*

¹⁵ *Id.* (mutual coercion, mutually agreed upon).

¹⁶ Beccaria, Cesare, (1986) *On Crimes and Punishment*. (D. Young, Trans.). Indianapolis, IN; Hackett Publishing. (original work published 1764), cited in Myers, David L., *Excluding Violent Youths from Juvenile Court: The Effectiveness of Legislative Waiver*. Ph.D. Dissertation, University of Maryland (2001).

¹⁷ Warren Beymer, Project Manager for Market Decisions Corporation, 8959 SW Barbur Boulevard in Portland, Oregon, 97219 (phone 503-245-4479).

regulatory requirements, DEQ compliance efforts, and the risks and consequences of noncompliance; against their perspectives about environmental stewardship, economic challenges, and effectiveness of regulatory oversight.

Executing the Public Survey¹⁸

The survey of the general public was completed first. Three hundred (n=300) interviews were conducted with Oregon residents between February 6 and February 25, 2001. All respondents were screened to have responsibility, or share responsibility, for their household's decisions in environmental areas such as automotive, waste disposal, and energy use.

A random probability sample was utilized in order to achieve results projectable to all residents of Oregon. Oregon residents were randomly chosen using random digit dialing (RDD). Using RDD, telephone numbers are generated by computer using known area codes and prefixes with the remaining four digits randomly selected within known working blocks of residential numbers. This technique provides the most representative sample of the population in the sampling frame. Non-response bias is minimized because RDD does not exclude people with unlisted telephone numbers or people who have recently moved or have been given new telephone numbers. Around 30% of households have unlisted telephone numbers, and these people would have been excluded without RDD sampling. To further minimize non-response bias, interviews were conducted between 5:00 p.m. and 9:00 p.m. Monday through Friday and on weekends between 11:00 a.m. and 7:00 p.m.

Geographic quotas were established to allow for meaningful comparisons between regions of the state. One hundred (n=100) interviews each were conducted in the Eastern, Northwest and Western regions of the state. Although these sample distributions do not perfectly match the population proportions of the state, they allow for meaningful comparisons between regions by ensuring a statistically valid sample size in each region.

The total sample of Oregon residents yields a maximum sampling variability of $\pm 5.7\%$ at the 95% confidence level. The range itself is expressed as a plus-or-minus value (e.g., $\pm 5.7\%$), which means that the sampling variability actually covers a range of 11.4%. For example, with a sample size of 300, for a 50% response, the sampling variability is not more than $\pm 5.7\%$, that is, the response would fall within the range of 44.3% and 55.7% ($50\% \pm 5.7\%$) in 95 out of 100 surveys. Note that the sampling variability is higher for each of the geographic regions ($\pm 9.8\%$ at the 95% confidence level for each geographic region).

Maximum sampling variability @ the 95% confidence level:					
	Response Percentage				
	50%	40% or 60%	30% or 70%	20% or 80%	10% or 90%
Total (n=300)	$\pm 5.7\%$	$\pm 5.5\%$	$\pm 5.1\%$	$\pm 4.5\%$	$\pm 3.4\%$
Eastern (n=100)	$\pm 9.8\%$	$\pm 9.6\%$	$\pm 8.9\%$	$\pm 7.8\%$	$\pm 5.9\%$
Northwest (n=100)	$\pm 9.8\%$	$\pm 9.6\%$	$\pm 8.9\%$	$\pm 7.8\%$	$\pm 5.9\%$
Western (n=100)	$\pm 9.8\%$	$\pm 9.6\%$	$\pm 8.9\%$	$\pm 7.8\%$	$\pm 5.9\%$

¹⁸ See Appendix I – Public Survey.

*Executing the Company Survey*¹⁹

Four hundred fifty (n=450) telephone surveys were conducted between June 19 and July 9, 2002 with a random selection of companies regulated by DEQ. All responding individuals were screened to have responsibility, or to share in the responsibility, of making business decisions regarding environmental rules and regulations for their facility. Although some companies in the database have multiple facilities, only one interview was completed per company, as the primary survey questions pertain to company-wide decision making. Although this paper uses the word “company” to describe all respondents, some respondents are sole proprietors and others are government or semi-governmental entities.

Interviews were conducted between 8:00 a.m. and 5:00 p.m. Monday through Friday to reach respondents during their daily working hours. Multiple attempts were made to reach each respondent and interview times were set at respondents’ convenience whenever possible. All respondents were carefully and repeatedly informed that the survey was confidential and information about their company would not be shared with DEQ or anyone else.²⁰ If requested, a letter from DEQ was emailed or faxed to respondents to confirm that DEQ commissioned Market Decisions Corporation to conduct this independent and confidential research on the agency’s behalf.

Two important factors affected the choice of target universe for the survey. First, only a very small portion of all Oregon companies conduct activities pervasively regulated by DEQ²¹ so, while random sampling of all Oregon companies would hypothetically allow conclusions to be drawn about the behavior of all Oregon companies, statistically significant results would have required a very large sample population. Second, there are entities other than “companies” which are regulated by DEQ including sole proprietors, trusts, semi-governmental and government entities – there is no cumulative list of these from which a sample could be drawn. Therefore, to create statistically significant results using a wide variety of entities that interact with DEQ regularly, the survey sample frame included only those 9,529 entities (herein “companies”) registered in DEQ’s databases. It should be noted that, as a consequence, conclusions of this study may not characterize the behavior of entities that evade permits or registrations.

Another goal of this research was to achieve actionable, projectable results within each type of regulation category. In order to achieve this goal, some groups were removed from the sampling frame. We chose one discrete group comprised of the most important pollutant sources and one discrete group representing less significant pollutant sources each from DEQ’s Water Quality Division (*i.e.*, NPDES²² and WPCF²³), Air Quality Division (*i.e.*, Title V²⁴ and ACDP²⁵) and the

¹⁹ See Appendix II – Company Survey.

²⁰ See Company Survey in Appendix II.

²¹ Approximately 150,000 foreign and domestic corporations, limited liability companies and limited-liability partnerships have filed with the Oregon Secretary of State Corporations Division, not including other types of entities, *e.g.*, sole proprietors, trusts, semi-governmental entities and governments. Business Report: Monthly update from Oregon's Secretary of State Bill Bradbury (Sept. 2003) available at www.filinginoregon.com/statistics/2003/0903.pdf.

²² National Pollutant Discharge Elimination System (NPDES) permits are issued to sources that discharge wastes into navigable surface waters by DEQ pursuant to its delegated authority under the federal Clean Water Act. Specifically, the

Land Quality Division’s Hazardous Waste Program (*i.e.*, LQG²⁶ and SQG²⁷). While vital to DEQ’s regulatory efforts, other sub-categories were eliminated in the interest of statistical integrity of the groupings. (See shaded grey in Table A below.)

Table A. Summary of the Company survey sample frame			
	Large	Small	Other²⁸
Water (n=6767) (1665 NPDES major and WPCF only)	NPDES Major (n=521)	WPCF (n=1144)	Other NPDES (n=5102)
Air (n=945) (945 Title V & ACDP only)	TITLE V (n=127)	ACDP (n=818)	
Land (Hazardous Waste) (n=1817) (941 LQGs & SQGs only)	LQG (n=329)	SQG (n=612)	CEG²⁹ (n=876)
Other (n=3149)			Other³⁰ (n=3149)

Minimum quotas were established to ensure a statistically valid sample size in each regulation category and sub-category, in order to allow for meaningful comparisons. Although the proportions of each regulation category and sub-category in the sample do not exactly match the actual

study targeted NPDES “majors” which are those sources that discharge large amounts of waste, discharge toxic pollutants, serve more than 10,000 people, or for other reasons need special regulatory control.

²³ Water Pollution Control Facility (WPCF) permits are issued to sources that dispose of wastewater through land application, evaporation or any means other than discharge to navigable surface waters.

²⁴ Oregon Title V Operating Permits (Title V) are issued to industrial sources that have the potential to emit more than 100 tons of certain non-toxic pollutants, 10 tons per year of any single hazardous air pollutant (HAP) or 25 tons of any combination of HAPs per year. The permits are issued by DEQ pursuant to its delegated authority under Title V of the federal Clean Air Act.

²⁵ Air Contaminant Discharge Permits (ACDPs) are issued to sources that emit air contaminants in sufficiently large amounts as to necessitate special regulatory control, but not large enough to require a Title V permit. Air Contaminant Discharge Permits are state permits but part of the State Implementation Plan prepared pursuant to the federal Clean Air Act.

²⁶ A generator of hazardous waste must register with DEQ as a Large Quantity Generator of Hazardous Waste (LQG) if it generates more than 2,200 pounds of hazardous waste in a calendar month or accumulates more than 2.2 pounds of acutely toxic hazardous waste on site.

²⁷ A generator of hazardous waste must register with DEQ as a Small Quantity Generator of Hazardous Waste (SQG) if it accumulates more than 2,200 pounds of hazardous waste on site or generates more than 220 pounds but less than 2,200 pounds of hazardous waste in a month.

²⁸ Other regulated sub-categories (shaded) were excluded from the sampling frame

²⁹ Conditionally Exempt Generator

³⁰ Entities holding certificates, licenses, or other permits with DEQ including: solid waste disposal permittees, underground storage tanks operating permittees, on-site septic system installers and service providers, and others.

proportions of the sampling frame, they allow for meaningful comparisons between categories by ensuring a statistically valid sample size in each.³¹

Table B below shows completed surveys (“completes”) by segment and the associated sampling variability. Note that some companies may be included in multiple regulation categories. The total sample of companies in major DEQ regulation categories yields a maximum sampling variability of $\pm 4.3\%$ at the 95% confidence level. The range itself is expressed as a plus-or-minus value (e.g., $\pm 4.3\%$), which means that the sampling variability actually covers a range of 8.6%. For example, with a sample size of 450, for a 50% response, the sampling variability is not more than $\pm 4.3\%$, that is, the response would fall within the range of 45.7% and 54.3% ($50\% \pm 4.3\%$) in 95 out of 100 surveys. Note that the sampling variability is higher for each of the regulation categories and sub-categories.

Table B. Summary of the maximum sampling variability at the 95% confidence level for various response percentages.					
	Response Percentage				
	50%	40% or 60%	30% or 70%	20% or 80%	10% or 90%
Total (n=450)	$\pm 4.3\%$	$\pm 4.2\%$	$\pm 4.0\%$	$\pm 3.5\%$	$\pm 2.6\%$
Water (n=214)	$\pm 6.2\%$	$\pm 6.1\%$	$\pm 5.7\%$	$\pm 5.0\%$	$\pm 3.8\%$
NPDES (n=91)	$\pm 9.3\%$	$\pm 9.2\%$	$\pm 8.6\%$	$\pm 7.5\%$	$\pm 5.6\%$
WPCF (n=131)	$\pm 8.1\%$	$\pm 7.9\%$	$\pm 7.4\%$	$\pm 6.5\%$	$\pm 4.9\%$
Air (n=137)	$\pm 7.8\%$	$\pm 7.6\%$	$\pm 7.1\%$	$\pm 6.2\%$	$\pm 4.7\%$
Title V (n=30)	$\pm 15.7\%$	$\pm 15.4\%$	$\pm 14.4\%$	$\pm 12.6\%$	$\pm 9.4\%$
ACDP (n=109)	$\pm 8.8\%$	$\pm 8.6\%$	$\pm 8.0\%$	$\pm 7.0\%$	$\pm 5.3\%$
Land (n=149)	$\pm 7.4\%$	$\pm 7.2\%$	$\pm 6.8\%$	$\pm 5.9\%$	$\pm 4.4\%$
LQG (n=58)	$\pm 11.7\%$	$\pm 11.4\%$	$\pm 10.7\%$	$\pm 9.4\%$	$\pm 7.0\%$
SQG (n=92)	$\pm 9.4\%$	$\pm 9.2\%$	$\pm 8.6\%$	$\pm 7.5\%$	$\pm 5.7\%$

Data Collection

All interviews were conducted using computer-aided telephone interviewing (CATI) software. This CATI system allows the interviewer to administer the questionnaire one question at a time via computer. This ensures each question is asked at the appropriate time during the survey and that respondents are automatically directed to the appropriate questions during complex skip patterns. Pre-coded responses are programmed so interviewers can simply “check” the answer and move to the next question. The CATI software allows interviewers to record verbatim or “other” (responses that do not fit into pre-coded choices) responses and enter numeric values. The software also ensures that responses cannot be out-of-range or illogical (i.e., percentages adding to more than 100% or saying “don’t know” while also giving another answer). In addition, the CATI software is used to manage all quotas, callback appointments and sample distribution. All data for complete and

³¹ The responses of some companies may be included in the results for multiple DEQ categories and sub-categories. For example, one company can be included in NPDES and WPCF, but would only be counted once in the Water category and once in the total. No company is represented more than once within a single category or total.

incomplete surveys is entered into the project database in real time and is immediately available for review and analysis.

All telephone interviews were conducted from Market Decisions Corporation's in-house telephone facility and all surveys were edited by quality editors as they were completed. Additional supervisors monitored interviews to insure that questions were listened to and understood as intended. Interviewers were screened upon application, trained to meet standards of performance and signed agreements of confidentiality. In addition, all interviewers received training specific to conducting interviews for this project.

After all data was entered and reviewed, open-ended (verbatim and "other" responses) questions were coded. A code was set for any response reaching a frequency of 2% - 3%. After coding was completed, data was tabulated for analysis and reporting.

After removing duplication in companies involved in multiple DEQ regulation programs, a total of 2,655 Oregon businesses remained for interviewing. All companies received a telephone call in attempt to complete an interview. The average number of attempts was two per company and the number of attempts ranged from one to eleven, depending on availability and appointment scheduling. Using Advertising Research Foundation (ARF) formulas, the net response rate for the business audience was 17% and the cooperation rate was 68%.³²

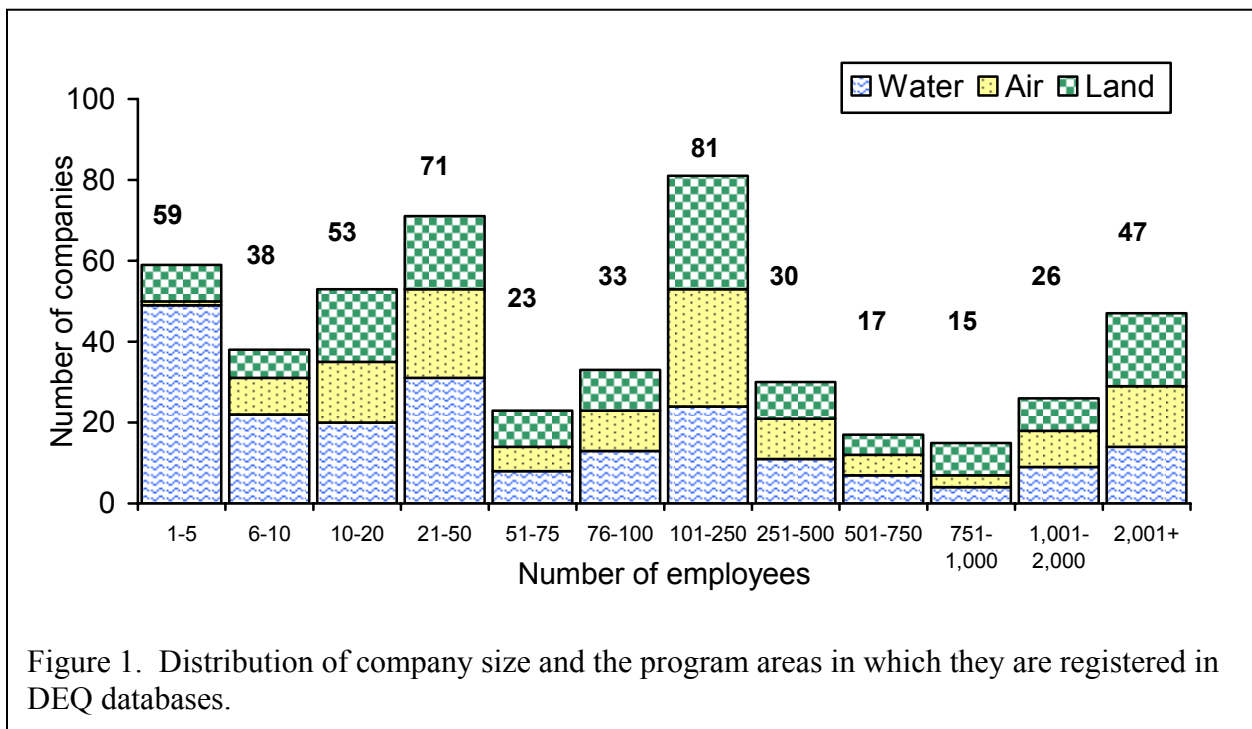
³² The ARF formulas, simply stated, are: Response Rate = Completed interviews / (completed interviews + non-completed interviews – ineligible records) and Cooperation Rate = Completed interviews / (completed interviews + refusals). *See*, Survey Response Definitions, Theodore F. Dunn, Ph.D., The Advertising Research Foundation, 1999.

RESULTS

Survey of Regulated Companies

Demographic description of the populations

The random survey resulted in a wide range of company respondents. Geographically, respondents represented every Oregon county. Of the total, most were located in rural locations (50%), with fewer in suburban and urban areas (17% and 31% respectively). Twenty-one percent of the total surveyed were in DEQ's Eastern Region counties and 72% of these were rural. Forty percent of the respondents were located in DEQ's Northwest Region (of these 44% urban; 22% suburban; 31% rural). The remaining 40% were located in DEQ's Western Region (of these, 57% rural; 15% suburban; 25% urban).³³

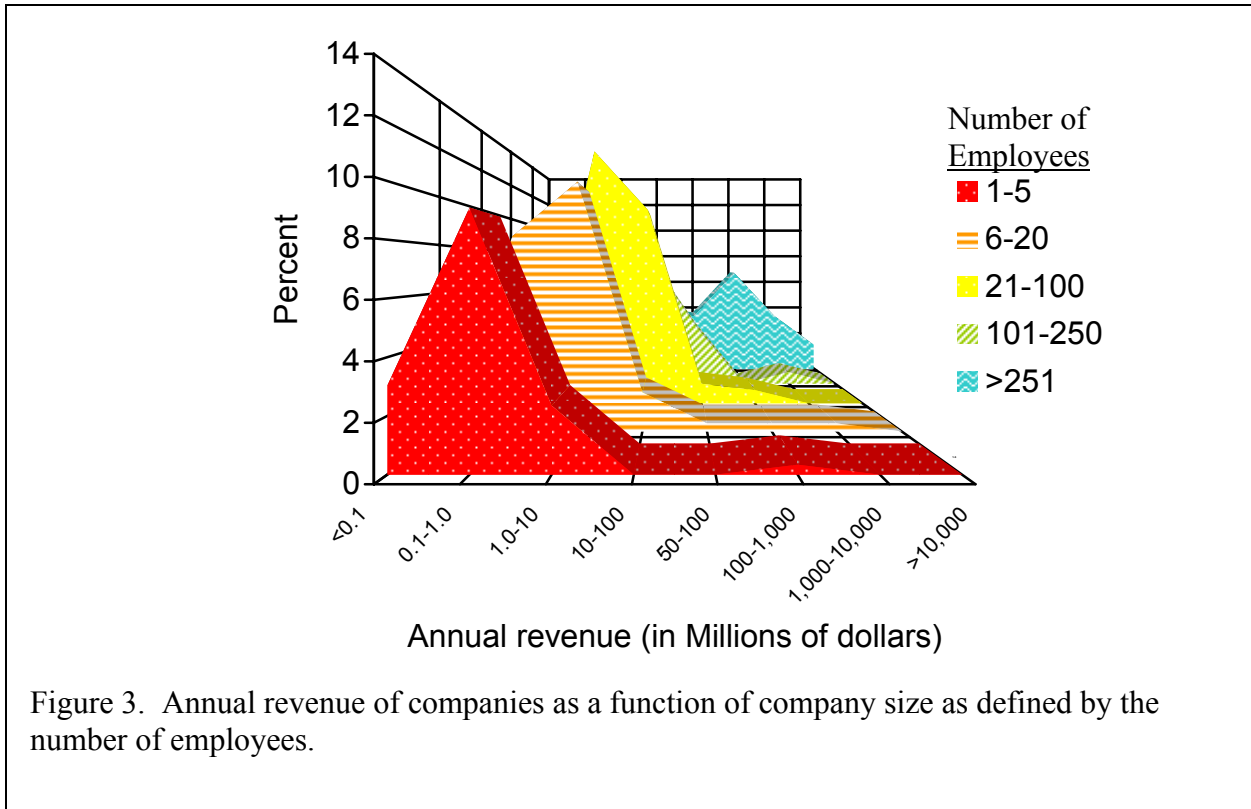
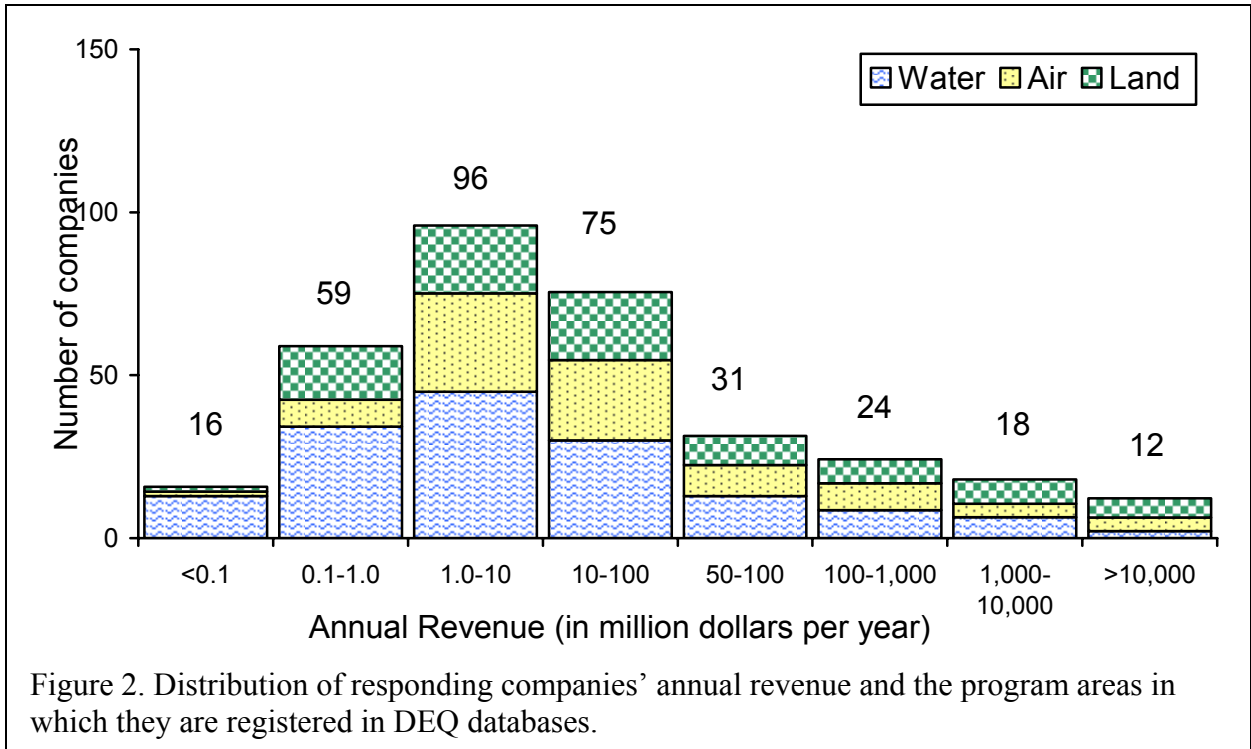


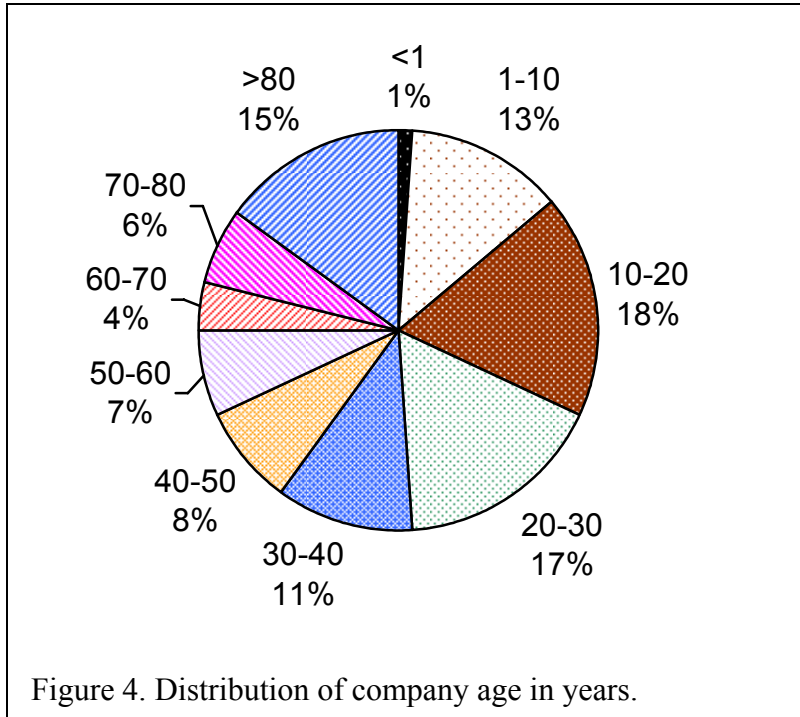
The size of companies varied between very small companies of one to five employees to large companies of over two thousand employees as shown above in Figure 1.³⁴ Companies also covered a wide range in annual revenue with an average self-reported range of between one and ten million dollars per year as shown below in Figure 2.³⁵ Annual revenue was significantly related to company size with the smallest companies having the lowest annual revenue ranging to the largest companies having the highest annual revenue as shown in Figure 3.

³³ Company Survey question nos. S7, D1.

³⁴ Company Survey question no. S5.

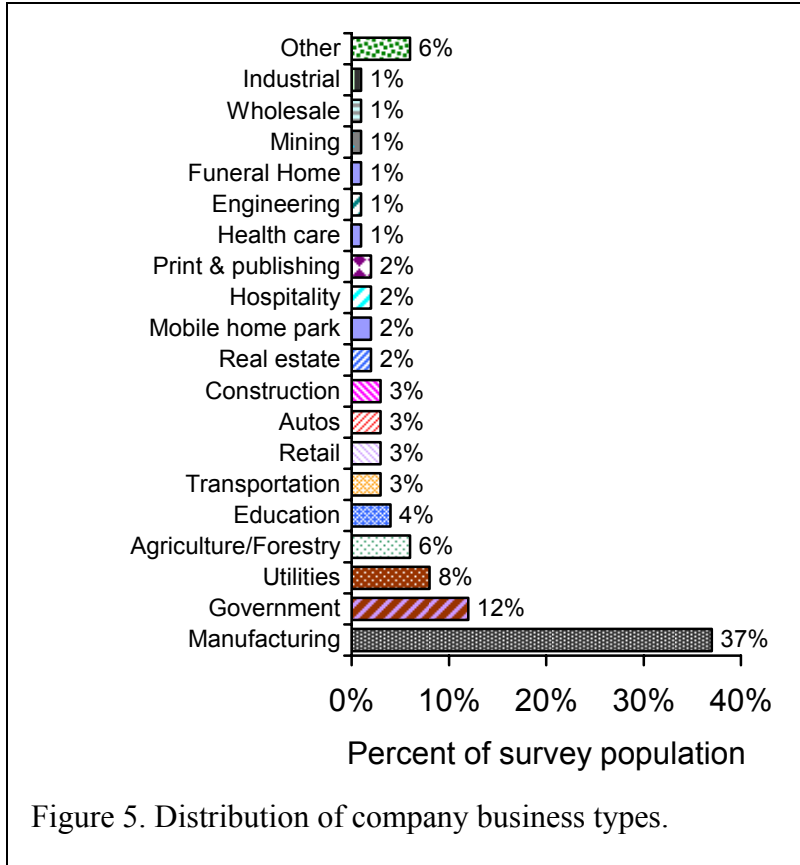
³⁵ Company Survey question no. D5.



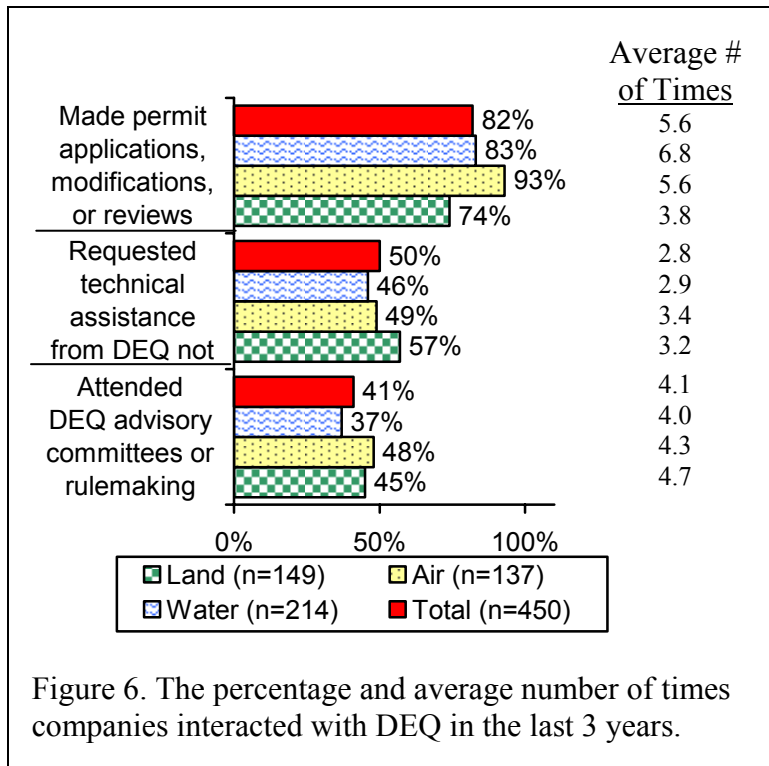


Companies had been in business in Oregon from less than one year to over 121 years. Fourteen percent had been in business less than 10 years. More than half had been in business more than 30 years. *See Figure 4.* Smaller companies were distributed in two distinct age groups. Companies with only 1-5 employees were significantly more likely to be less than 10 years old than any other size company. For reasons unknown, companies with 1-5 employees were less likely to be between 11 and 20, but more likely to be between 21 and 30 years old, than any other size company.

Despite the fact that the sample population was drawn only from companies in DEQ's Air, Water, and Land Division databases, they represented a wide range of primary business types. (*See Figure 5.*)

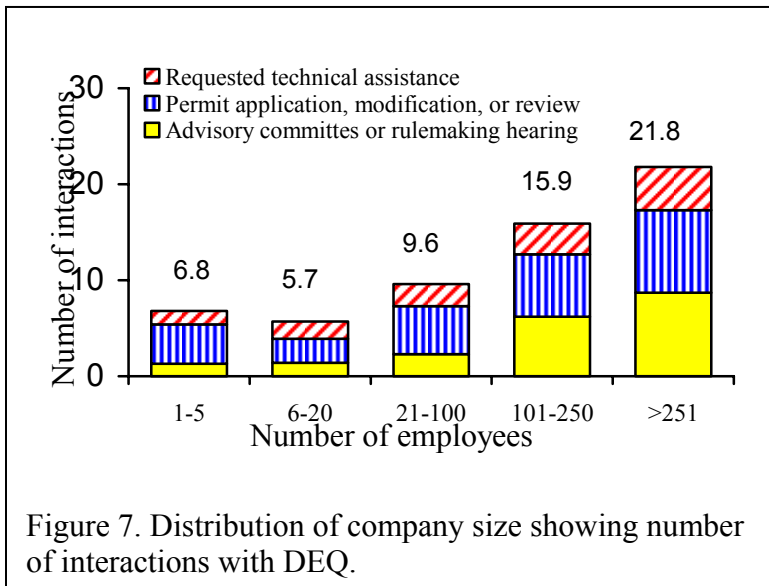


Respondents are highly involved with DEQ either through permit applications, modifications or reviews (82% have interacted with DEQ in these ways, averaging 5.6 contacts each in the last three years); attending DEQ advisory committees or rulemaking hearings (41% have interacted with DEQ, averaging 4.1 times each); or requesting technical assistance from DEQ not related to permit applications or inspections (50% have interacted with DEQ, averaging 2.8 times each). The graph below (Figure 6.) presents the percentage of respondents who have taken these actions over the past three years, and how many times they have done so.



Respondents from larger companies are more likely to be actively involved with DEQ. For example, companies with 251 or more employees made 8.6 permit applications, modifications or reviews; attended 8.7 DEQ advisory committee or rulemaking hearings; and requested technical assistance not related to permit application or inspection 4.5 times compared to companies with 1-5 employees which made 4.1 permit applications, modifications or reviews; attended 1.3 advisory committees or rulemaking hearings; and requested technical assistance not related to permit application or inspection 1.4 times. (See Figure 7).

Placement of responsibility for environmental law compliance in the company hierarchy³⁶



The survey contacted the person at the company who had responsibility – or shared responsibility – for environmental compliance, or made business decisions regarding environmental rules and regulations for the facility.³⁷ Gender distribution of the respondents for each and all programs was approximately 80% male and 20% female. In most companies higher level managers had or shared responsibility for environmental compliance (president/owner 35%, general manager 20%, vice president 16%,

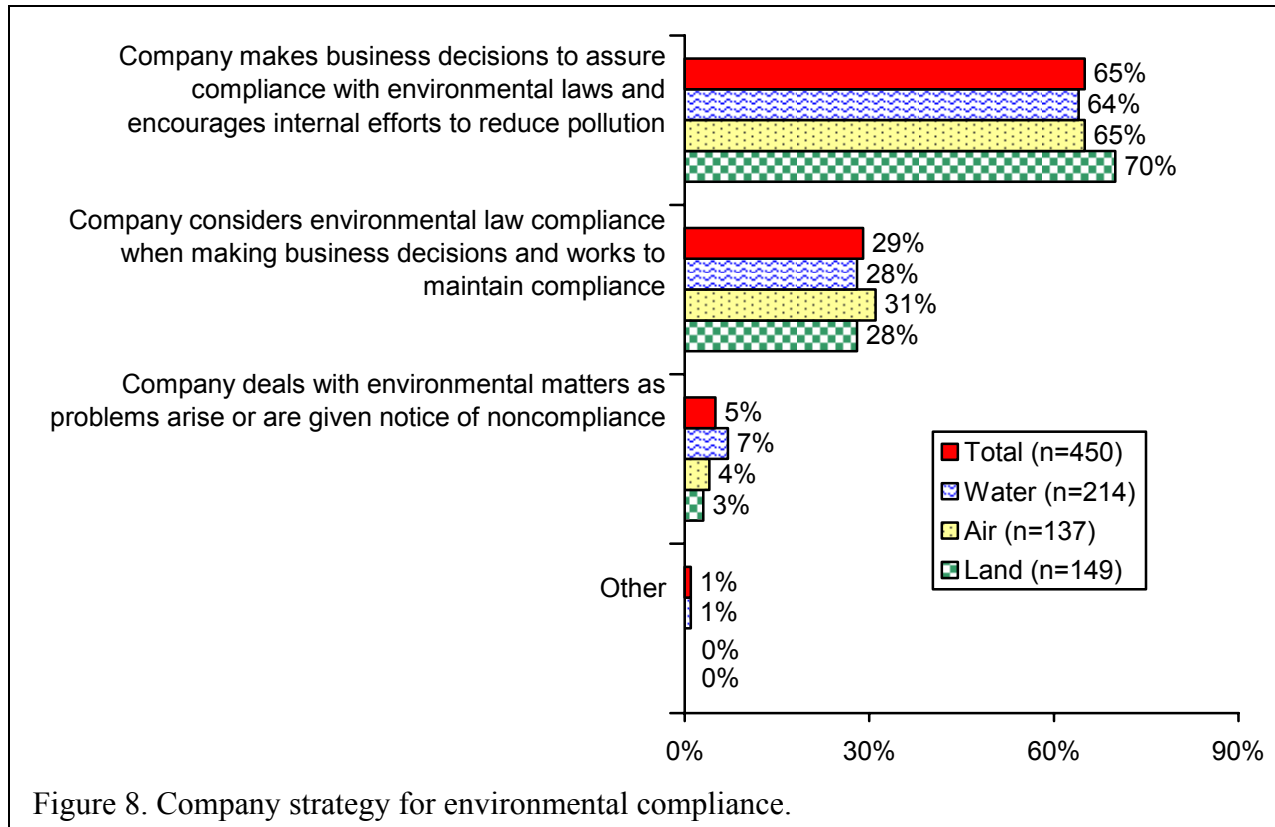
board of directors or city council 5%). Thirty-three percent of the companies have designated environmental managers or directors, but 30% of these also handle all health and safety matters. Very few of the companies had given environmental responsibility to non-management employees

³⁶ Company Survey question no. Q1 asked respondents to volunteer “Which positions or job titles in your company have primary responsibility for decisions regarding environmental law compliance?”

³⁷ Company Survey question no. S1 identified whether the contact had that responsibility or sought a referral if that person did not have that responsibility.

(production staff 2%, engineer 2%, attorney 1%). Size of the company is the key determinant as to who has primary environmental responsibility. The president or owner is more likely to have the responsibility in smaller companies, and other executives or managers are more likely to be responsible in larger companies.³⁸

Company attitude about environmental compliance³⁹



Overall, two-thirds of the companies (65%) claim to make decisions that assure compliance with environmental laws and encourage internal efforts to reduce pollution, whereas only 5% of companies deal with environmental matters as problems arise or are given notice of noncompliance. Only one company reported that it “avoids dealing with environmental matters, occasionally receiving notices of noncompliance or noncompliance fines.” Decision-making to assure compliance

³⁸ Six in ten (61%) companies with 1-5 employees report that the president/owner is responsible for environmental law compliance. The president/owner is responsible in 41% of companies with 6-100 employees, 29% of companies with 101-250 employees and only 16% for companies with 251 or more employees. In large companies, other managers are significantly more likely to be responsible for compliance: 1-5 employees (15%); 6-20 employees (21%); 21-100 employees (33%); 101-250 employees (44%); and 251 or more employees (32%). Companies with more than 100 employees are significantly more likely than smaller companies to have an environmental manager with responsibility for making decisions regarding environmental laws and compliance: 1-20 employees (1%); 21-100 employees (9%); 101-250 employees (26%); and 251+ employees (36%).

³⁹ Company Survey question no. Q2 asked respondents to choose “which one of the [statements provided] would you say best describes how your company typically deals with environmental matters?”

with environmental laws increases significantly with the size of the companies.⁴⁰ (See Figure 9). Companies with 1-5 employees were significantly less likely to belong to groups or organizations that promote environmental accountability for businesses.⁴¹

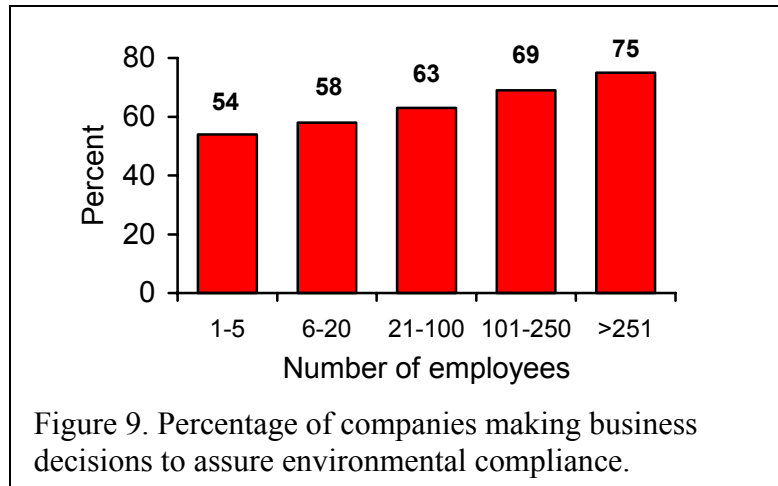


Figure 9. Percentage of companies making business decisions to assure environmental compliance.

Companies in the Agriculture/forestry/fishing industries are most likely to consider themselves “compliant thinking” (81%) compared to other industries surveyed (Utilities 76%; Manufacturing/Production 66%; Government 54%; Other Industries 63%).

Frequency of changes made because of environmental issues⁴²

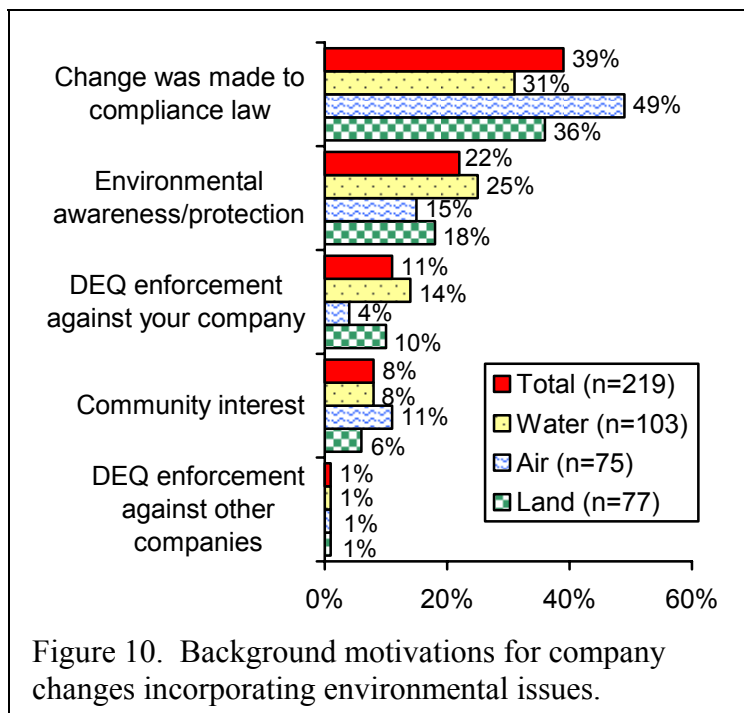


Figure 10. Background motivations for company changes incorporating environmental issues.

Nearly half (49%) of all companies recently made changes that incorporated or resulted from environmental issues. Companies were more likely to have made changes for air quality reasons (55%) than for either water quality or hazardous waste. Larger companies are more likely to have recently made changes for environmental reasons (22% 1-5 employees; 46% 6-100 employees; 61% 101+ employees). Also, companies that have been penalized by DEQ for past environmental violations are significantly more likely than those never penalized to have recently made these changes (60% vs. 43%, respectively).

Of the companies making management, production or operation changes

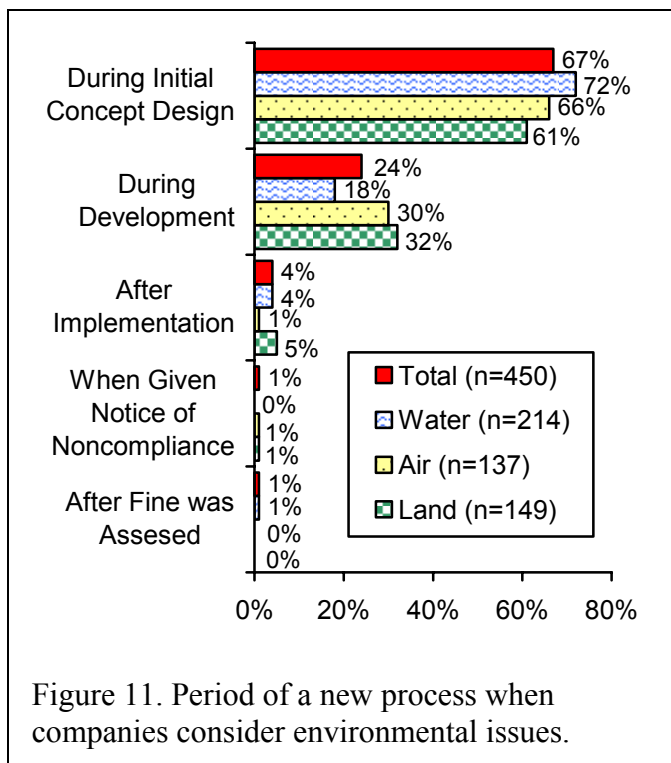
⁴⁰ 1-5 employees (54%); 6-20 employees (58%); 21-100 employees (63%); 101-250 employees (69%); 251 or more employees (75%).

⁴¹ From Company Survey question no. D2. Sixty-nine percent of companies with 1-5 employees are not members of such organizations compared to companies with 6-10 employees (48%), 21-100 employees (54%), 101-250 employees (53%), and more than 250 employees (48%).

⁴² Company Survey question no. Q3 asked “Has your company recently made any management, production, or operation changes that incorporated environmental issues, or were as a result of, environmental issues?”

incorporating or resulting from environmental issues,⁴³ 39% reported that the changes resulted from changes in the law. However, companies with 1-5 employees were significantly less likely (15%) to have made process changes because of changes in the law. Companies reported that concern about the environment stimulated 24% of the changes. Eleven percent resulted from a company policy or directive for reasons unknown. “Community interest” stimulated 8% of the changes with an additional 1% of the changes resulting from customer demand. Another 11% resulted from enforcement against the company. Only 3 of the 450 companies (<1%) volunteered that the changes resulted from enforcement against other companies.

Kinds of changes made because of environmental issues⁴⁴



Most of the management, production or operations changes made incorporating or resulting from environmental issues were for “improved water treatment” (26% for all facilities surveyed and 51% of government organizations surveyed). “Purchase of new equipment” was the second most-common change (22%). Other responses included: use of environmentally friendly chemicals/products (16%), improved air emissions (11%), recycling (10%), produce less waste (9%), remove/replace storage tanks (8%), hired/brought in personnel to help (5%), internal audits/inspections (4%), maintenance/repair (3%), reform of current policies/procedures (3%), work with public to improve (3%), employee education/training (2%), purchased more land (1%), added new plant/facility (1%), improved truck/tractor washing practices (1%), and other (11%).

When does the company first consider environmental compliance?⁴⁵

Overall, two-thirds (67%) take environmental compliance into consideration during the initial concept design when developing new management, operations or production processes. (See Figure 11.)

⁴³ For respondents answering “yes” to Company Survey question no. Q3, Q4 asked “What issues led your firm to make production and operation changes that relate to the environment?”

⁴⁴ Company Survey question no. Q5 asked “Exactly what management, production, and/or operation changes has your company made that incorporated environmental issues or was a result of environmental issues?”

⁴⁵ Company Survey question no. Q6 asked “When your company develops new production processes, which one of the [statements listed in Figure 11] best describes the point at which environmental compliance concerns are considered?”

Most-important factors stimulating compliance⁴⁶

Respondents evaluated a series of motivating factors for bringing their company back into compliance with environmental laws if they, for some reason, found themselves in noncompliance. The degree of influence of each factor was rated using a seven-point scale where seven means “tremendous influence” and one means “no influence.” The average ratings and the percent of companies’ ratings the concern at 6 or 7 for each factor are presented in the Table C below.

Table C. Company ratings of the top compliance motivators.					
	Average Rating ⁴⁷	Total (n=450)	Water (n=214)	Air (n=137)	Waste (n=149)
Concern over a forced shut-down	6.3	83%	79%	88%	84%
Concern about the environment	6.3	81%	81%	77%	81%
Concern over criminal prosecution	6.2	80%	78%	80%	81%
Concern about reputation	6.0	73%	68%	76%	80%
Pressure or concern from the community	5.9	67%	68%	65%	69%
Pressure or concern from customers	5.9	67%	70%	57%	70%
Financial pressure of actual fines	5.8	69%	71%	65%	68%
Financial pressure of potential fines	5.8	68%	71%	69%	64%
Pressure from insurers	5.6	63%	62%	62%	64%
Pressure from employees	5.5	56%	53%	55%	61%
Withholding of state or federal contracts	4.2	38%	40%	39%	34%

Companies were more concerned about forced shut-down, the environment, criminal prosecution, reputation, pressure from the community, and pressure from customers than about actual or potential fines. Smaller companies are significantly more likely to say “the financial pressure of actual fines” would have a great deal of impact (ratings of 6 or 7) in their decision to get back into compliance (83% 1-5 employees; 70% 6-250 employees; 60% 251+ employees). Less than four in ten (37%) respondents from companies with 251 or more employees say the impact of potential fines would have “tremendous impact,” compared to 54% of smaller companies (58% 1-5 employees; 55% 6-20 employees; 52% 21-100 employees; 53% 101-250 employees). Smaller companies tend to feel more pressure or concern from insurers to comply with environmental regulations than do larger companies. Nearly half (46%) of respondents from companies with 1-100 employees say pressure

⁴⁶ Company Survey question no. Q7 asked “If for some reason your company found itself in noncompliance with environmental laws, please tell me how influential the following items would be in motivating your company to get back into compliance. Please rate the degree of influence each item would have using a scale from 1 to 7 where ‘7’ means a “tremendous influence” and ‘1’ means “no influence.” How much influence would [each listed item in Table C] have on motivating your company to get back into compliance?”

⁴⁷ For most of these factors, a difference of approximately 0.2 indicates a statistically significant difference.

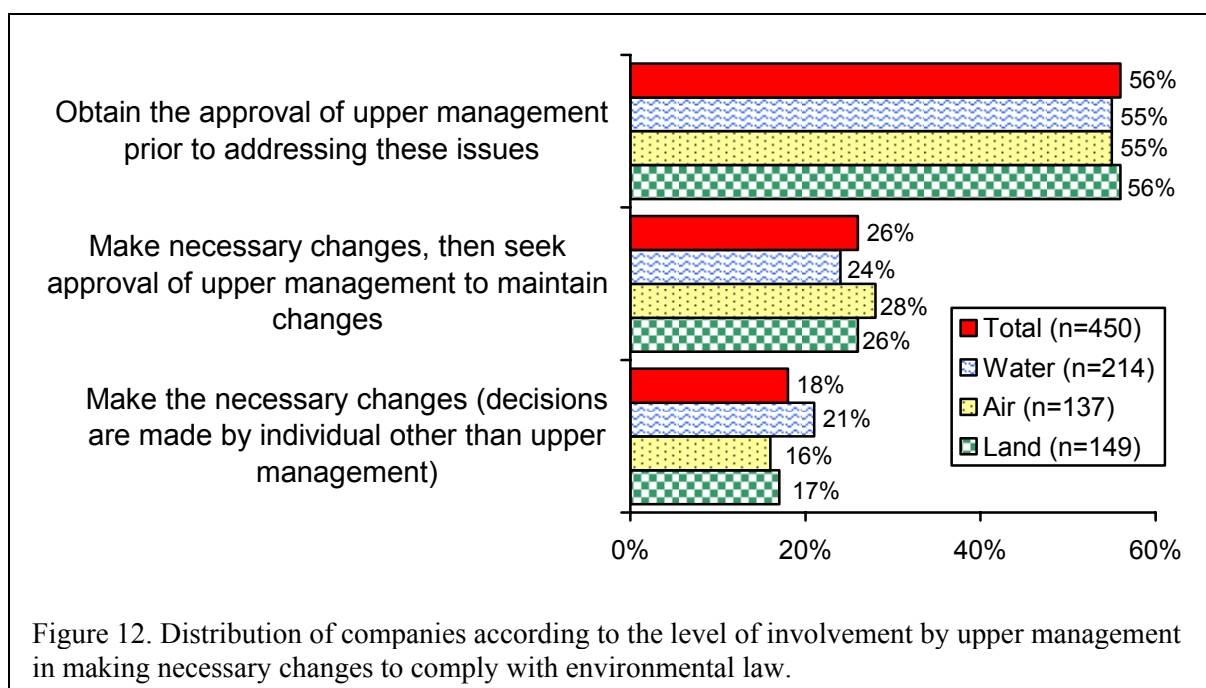
or concern from insurers would have “tremendous impact” compared to 32% from companies with 101 or more employees.

Upper management involvement in correcting environmental violations⁴⁸

Nearly all respondents said upper management is likely to get involved in directing an effort to attain compliance (99%), allocating resources to fix the problems (99%), addressing public perception (95%), educating staff (94%), and disciplining staff (91%) if an environmental penalty was assessed against their company or facility.

No statistically significant differences were noted between respondents in the different program areas. However, 95% of respondents in the utility industry and 81% in government report that upper management would be “very likely” to get involved to address public perception. Of the respondents in the Manufacturing/Production and Agriculture/Fishing industries, only 68% and 54% respectively say upper management would become involved to address public perception. Respondents from companies previously penalized for violating environmental regulations are significantly less likely than those from companies not penalized to say upper management is “very likely” to get involved in disciplining staff (61% vs. 72%, respectively).

Who approves the changes necessary to maintain compliance?⁴⁹



⁴⁸ Company Survey question no. Q9 asked “If there were an environmental penalty assessed against your firm, please rate the likelihood of upper management getting involved to do the following things. Would upper management be very likely, somewhat likely, not too likely, or not at all likely to get involved to . . .”

⁴⁹ Company Survey question no. Q10 asked “When it comes to making production and operation changes in order to maintain compliance with environmental laws, are employees at your company generally required to [which of the 3 choices listed in Figure 12]?”

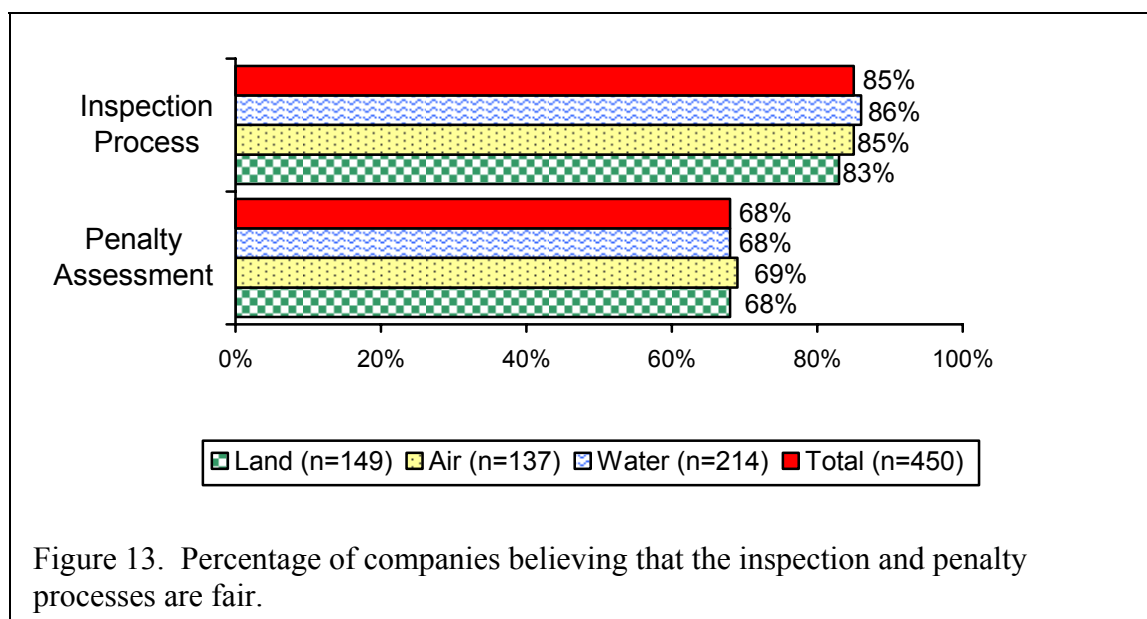
When it comes to making production and operations changes in order to maintain compliance with environmental laws, more than half (56%) report that employees must obtain approval of upper management prior to addressing the issues. See Figure 12 above.

Companies with 251 or more employees are significantly less likely than smaller companies to require approval of upper management prior to making changes in order to maintain environmental compliance (45% vs. 60%, respectively).

***Are the inspection and enforcement processes fair?*⁵⁰**

Oregon companies rated DEQ’s penalty assessment and inspection process using a four-point scale where four is “very fair” and one is “not at all fair.” Overall, more than eight in ten (84%) feel the inspection process is fair and two-thirds (68%) feel the penalty assessment process is fair (“somewhat” plus “very” fair). The percentages who feel the penalty assessment and inspection processes are fair (“somewhat” plus “very” fair) are presented in the Figure 13 below for the various programs.

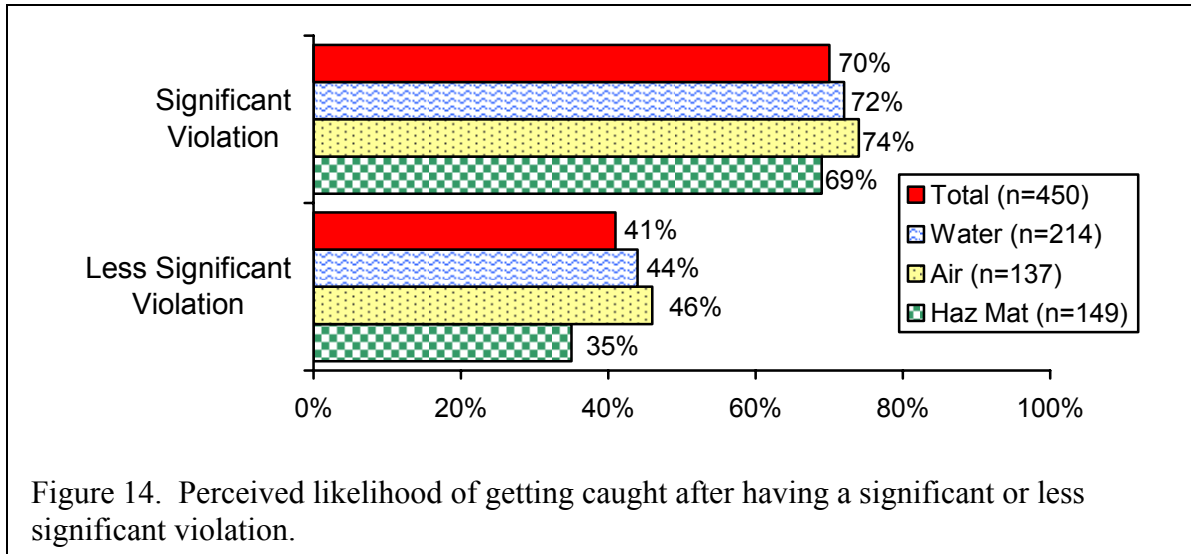
Respondents who had received a prior penalty were more likely to say that the process was “very fair” and “somewhat fair” than respondents who had not received a penalty (25% vs. 23% and 46% vs. 44% respectively).



⁵⁰ Company Survey question nos. Q11, Q11B.

Risk that a violation will be discovered by DEQ?⁵¹

The perceived likelihood of getting caught (DEQ finding out about a violation) is a great deal higher if respondents’ companies were to experience a “significant violation” (70%) compared to a “less significant” violation (41%). The percentage of respondents responding that DEQ definitely or almost definitely would find out is presented in Figure 14 below.



Respondents from companies previously penalized for environmental violations are significantly more likely than those from companies never penalized to feel DEQ “definitely would find out” about a significant violation (62% vs. 46%, respectively). These respondents are also significantly more likely to feel DEQ would “definitely find out” about a less significant violation (34% vs. 23%).

What kinds of risks of monetary penalty cause the most concern?⁵²

Respondents evaluated several frequencies and sizes of civil penalties (each of which results in the same risk in average dollars) and selected the one that would raise the most concern. Respondents appeared to be most concerned about small fines assessed to many companies and one big fine assessed to one company. The percentages of respondents selecting each penalty as the one that would raise the most concern are presented below in Figure 15 for the various programs, but no statistically significant differences were noted between programs.

⁵¹ Company Survey question no. Q12 asked “If your company experienced a significant environmental violation for some reason, how likely do you think it is that DEQ would find out about it? Please use a 7-point scale where ‘7’ is “DEQ definitely would find out” and ‘1’ is “definitely would not find out.” Question 13 asked whether DEQ would find out about less significant violations.

⁵² Company Survey question no. Q14 asked “If you learned in the following year DEQ planned to assess one of the following types of civil penalties, which one of these would raise the most concern for your company? [one-thousand \$500 penalties; five-hundred \$1,000 penalties; one-hundred \$5,000 penalties; fifty \$10,000 penalties; ten \$50,000 penalties; or one \$500,000 penalty]”

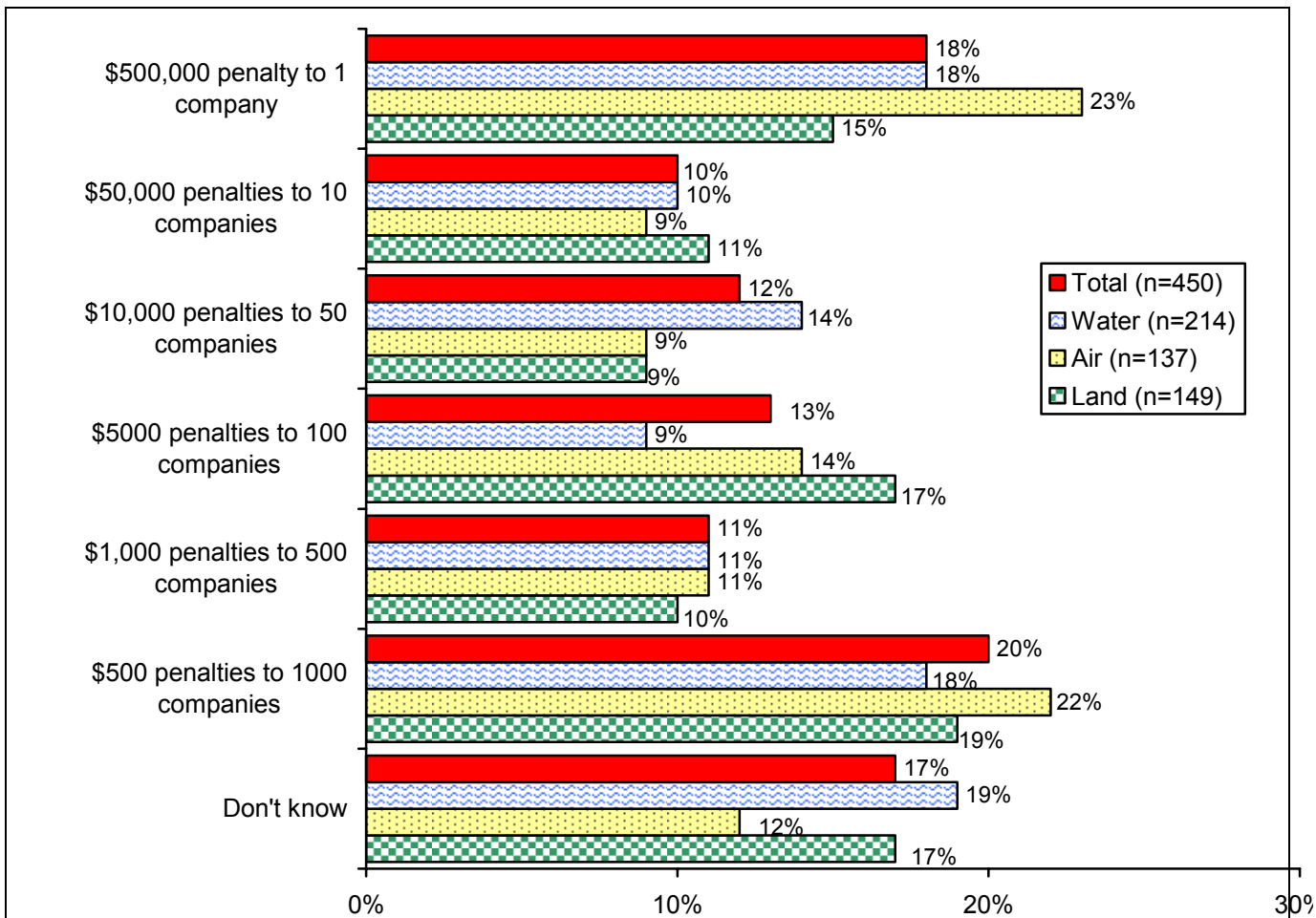


Figure 15. Company concern about penalties as a function of penalty size and frequency.

Factors DEQ should consider in assessing penalties⁵³

Respondents were asked whether DEQ should take several factors into account when assessing or increasing the size of penalties against Oregon companies.⁵⁴ Table D below summarizes the percentage saying “yes, DEQ should consider” these various factors.

⁵³ Company Survey question no. Q14.

⁵⁴ Company Survey question no. Q15, Q15N.

Table D. Top rated factors that should contribute to penalty size.				
	Total (n=450)	Water (n=214)	Air (n=137)	Land (n=149)
Whether the company cooperated with DEQ in correcting the violation	98%	98%	98%	99%
Whether the violation was accidental, intentional, or due to negligence on the part of the company	96%	96%	97%	95%
Whether the violation caused a risk to public health and the environment	96%	96%	97%	95%
Actual amount of environmental damage	95%	94%	93%	97%
Whether the company avoided or delayed compliance	95%	93%	96%	95%
Whether the company has had previous violations	94%	94%	94%	92%
The duration of the violation	89%	91%	89%	85%
Whether the law violated is new	76%	72%	80%	74%
Whether the penalty would economically damage the company	68%	68%	66%	68%
The extent to which the company actually knows the environmental regulations	62%	63%	56%	61%
Whether the company has the ability to pay the penalty	61%	62%	58%	61%
The amount of DEQ resources it would take to handle the case	52%	55%	48%	47%
The size of the company	50%	50%	43%	54%
Whether the media will publicize the penalty	26%	29%	20%	22%

Companies were significantly more likely to believe that DEQ should consider “whether the company cooperated with DEQ in correcting the violation” (98%), “whether the violation was accidental, intentional, or due to negligence on the part of the company” (96%), “whether the violation caused a risk to public health and the environment” (96%), the “actual amount of environmental damage” (95%), “whether the company avoided or delayed compliance” (95%) and “whether the company has had previous violations” (94%). Small companies are significantly more likely than larger companies to say DEQ should consider the amount of DEQ resources required to handle the case when issuing penalties (65% 1-20 employees vs. 46% 21+ employees). Respondents were also asked if there were any other factors DEQ should consider when issuing penalties – no respondent gave any responsive answer suggesting other criteria.

Companies’ awareness of inspections and enforcement at other facilities⁵⁵

Respondents report having most frequently heard or read about DEQ in connection with DEQ inspections. Figure 16 below summarizes the proportion of respondents who have heard or read about DEQ compliance activities in the past three years and how many times they have done so.

⁵⁵ Company Survey question no. Q16.

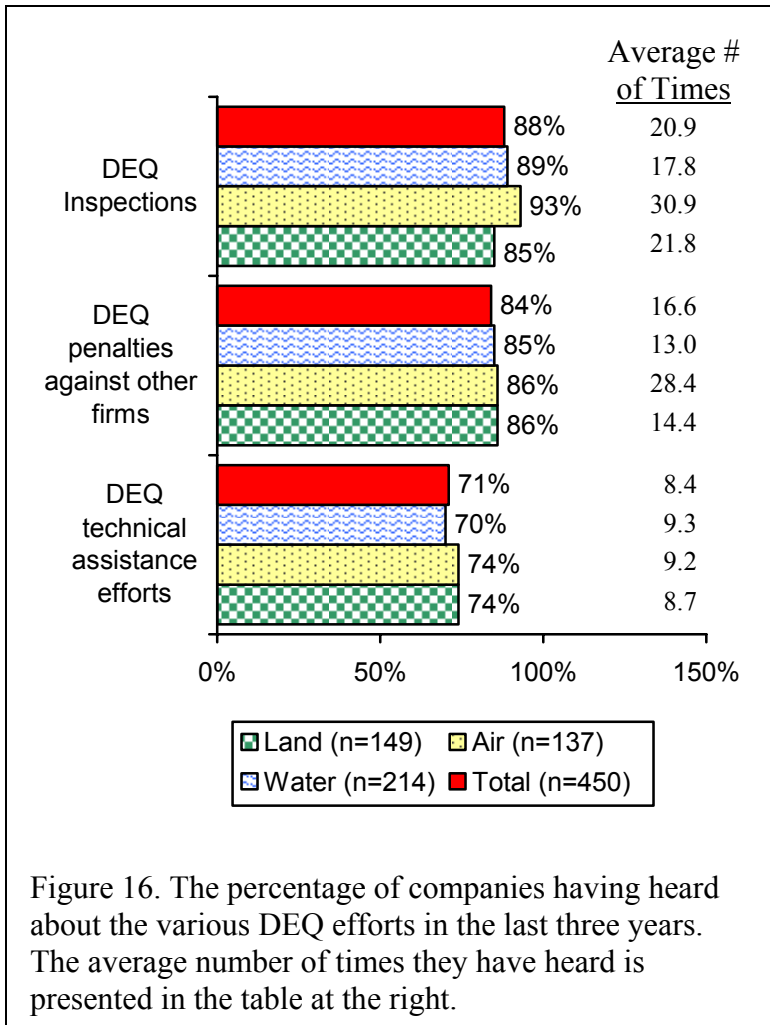


Figure 16. The percentage of companies having heard about the various DEQ efforts in the last three years. The average number of times they have heard is presented in the table at the right.

Figure 17 shows that, as the size of the company increases, the frequency with which the respondents have read or heard of DEQ actions increases significantly.

Companies in the Air program report having seen or heard about DEQ inspections significantly more often than those involved in the Water or Land programs (30.9 times vs. 17.8 times and 21.8 times, respectively). The significantly higher frequency within the Air program can be attributed to the Title V companies who report having read or heard about DEQ an average of 80.0 times in the past three years.

Respondents from companies previously penalized by DEQ report having heard or read more frequently about DEQ efforts than companies not fined (39.5 times vs. 12.6 for inspections; 27.1 times vs. 11.3 times for penalties; 13.2 times vs. 6.0 times for technical assistance).

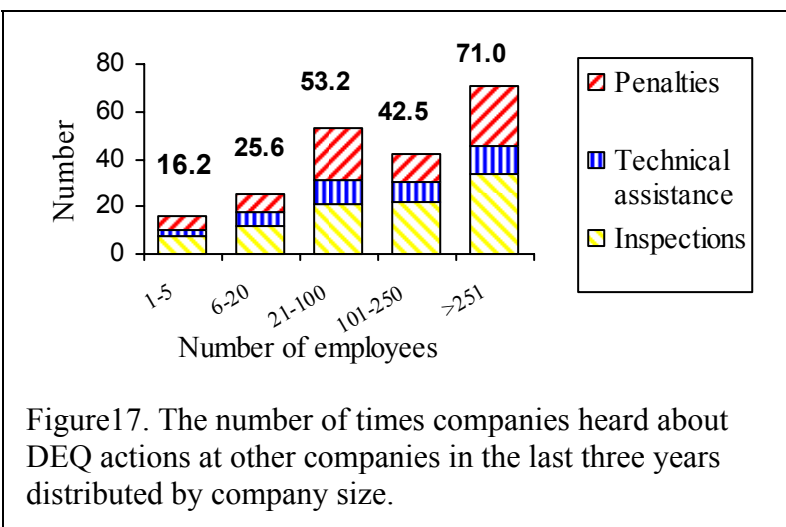
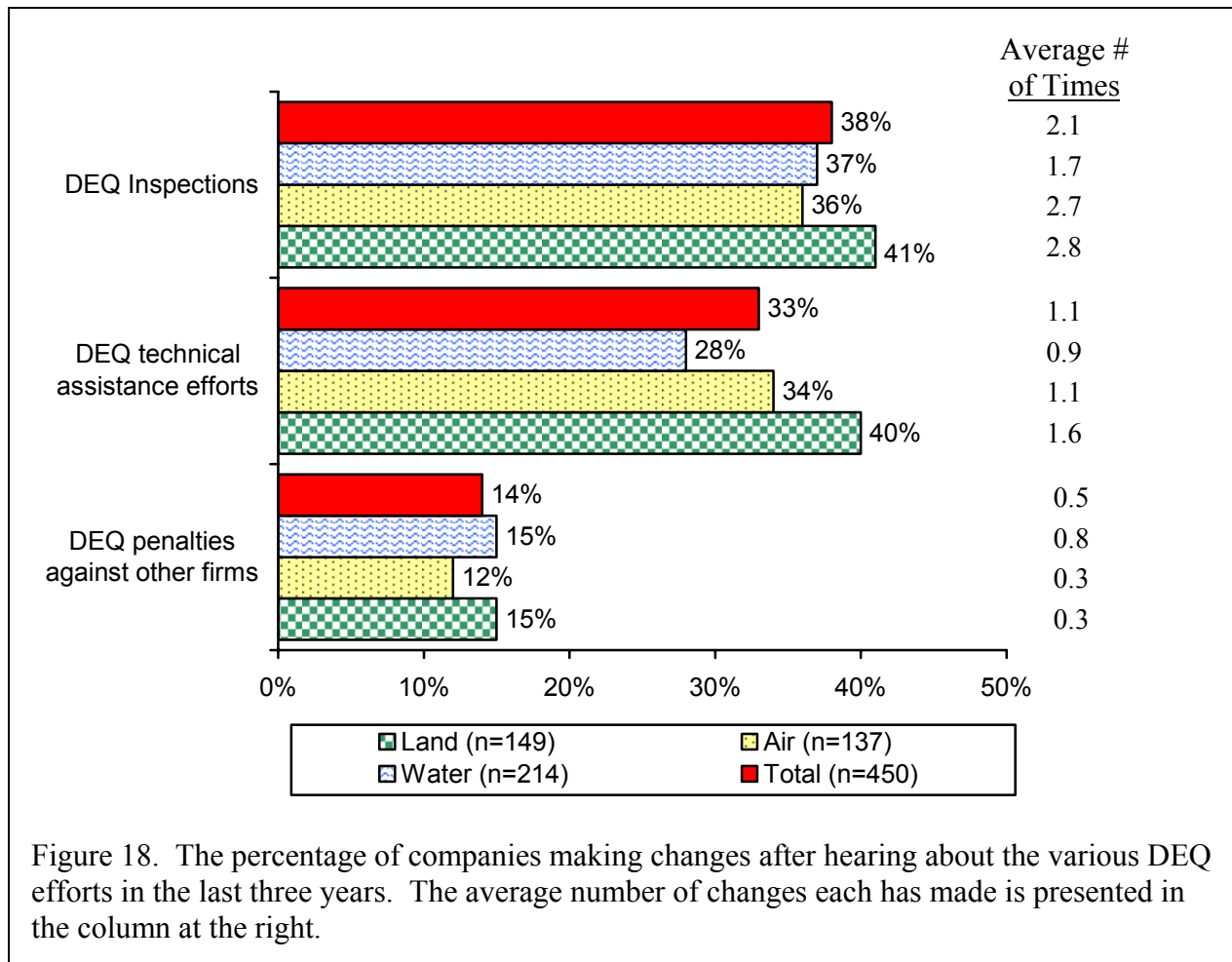


Figure 17. The number of times companies heard about DEQ actions at other companies in the last three years distributed by company size.

Do DEQ actions at one facility stimulate changes at other facilities?⁵⁶

Figure 18 below presents the percentage of companies which have made changes as a direct result of learning about DEQ inspections, technical assistance and penalties against other firms over past three years, and how many times they have done so. Inspections were the most important stimulators for companies making changes to their production, manufacturing or operating practices.

⁵⁶ Company Survey question no. Q17.



Four in ten (38%) have made changes resulting from hearing about DEQ inspections over the past three years and, on average, have made changes 2.1 times. One-third (33%) of respondents have made changes resulting from hearing about DEQ’s technical assistance efforts in the past three years, and on average, have made changes 1.1 times. One in seven (14%) have made changes resulting from DEQ penalties against other firms in the past three years and on average, they have made changes 0.5 times.

Companies previously penalized by DEQ for environmental regulations are significantly more likely to have made changes over the last three years in management, production or operation resulting from learning of DEQ inspections and penalties against other firms. After hearing about DEQ inspections, companies that had previously been penalized averaged 3.9 changes while companies that had not been previously penalized averaged 1.3. After hearing about DEQ penalties, companies that had previously been penalized averaged 1.0 change while companies that had not been previously penalized averaged 1.3.

How many companies are performing audits?⁵⁷

Among all respondents, more than eight in ten (85% Total; 82% Water; 90% Air; 90% Land) responded that the company performs comprehensive internal inspections for environmental compliance each year (Figure 19). On average, these companies perform such inspections 26.5 times per year (28.8 Water, 27.8 Air, 28.1 Waste) (Figure 20).

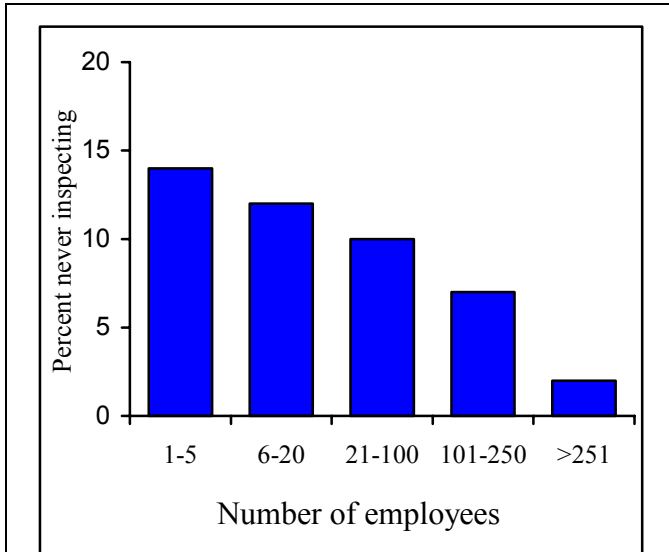


Figure 19. Percentage of companies reporting that they never perform comprehensive internal inspections for environmental compliance as a function of company size.

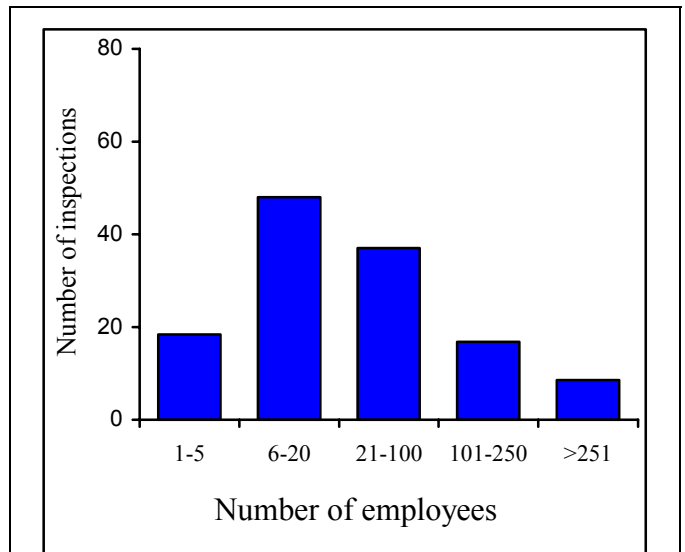


Figure 20. Number of "comprehensive internal inspections" for environmental compliance companies perform as a function of company size.

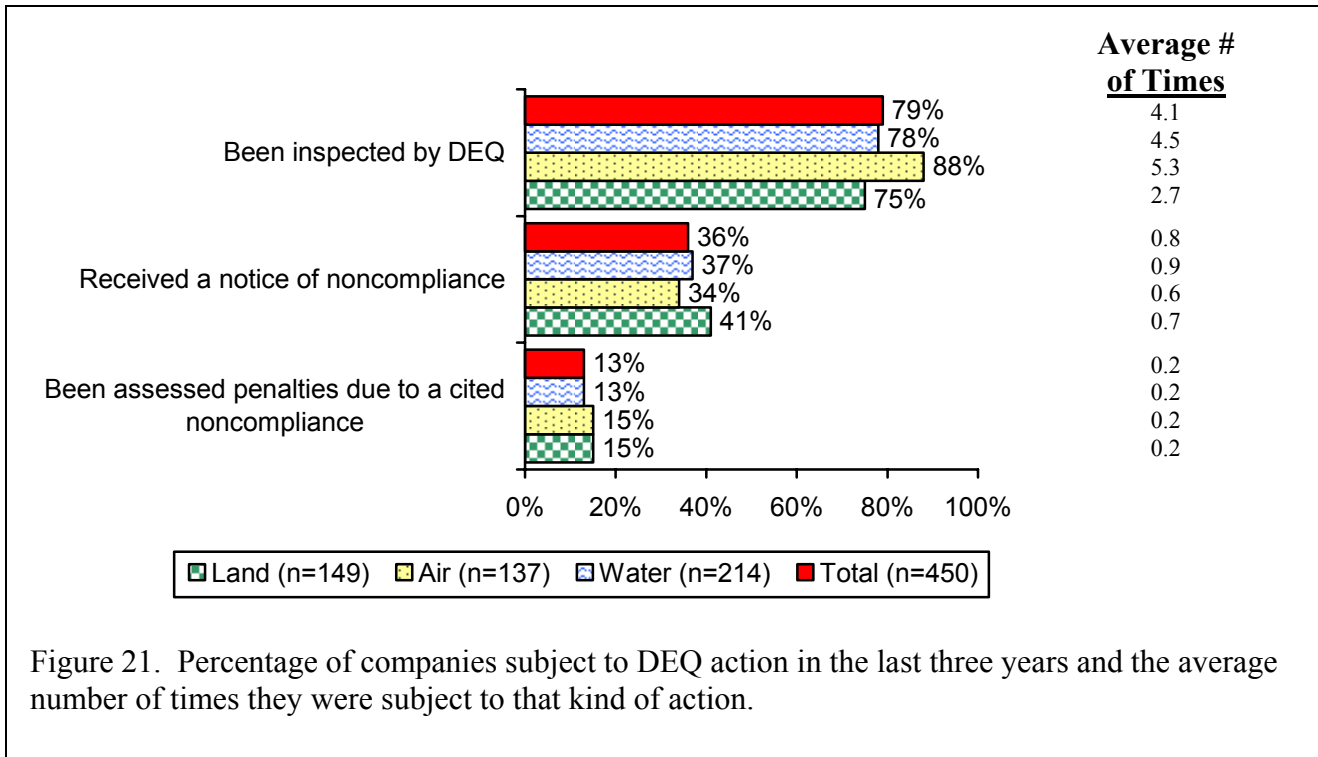
There may be significant variability in what each respondent considers a "comprehensive internal inspection." The smallest companies are significantly more likely to never perform audits than largest companies (Figure 19).

How many of the companies were inspected or penalized?⁵⁸

In the last three years, eight in ten (79%) respondents have been inspected by DEQ and one-third (36%) report receiving a notice of noncompliance. One in seven (13%) have been assessed penalties due to a cited noncompliance. Figure 21 below presents the percentage of respondents that have been inspected, assessed penalties and received a notice of noncompliance over past three years, and how many times it has occurred.

⁵⁷ Company Survey question no. Q20.

⁵⁸ Company Survey question no. Q19.



Eight in ten (79%) report that their company has been inspected by DEQ and, on average, has been inspected 4.1 times in the past three years. Respondents in the Air program are significantly more likely to have been inspected by DEQ in the past three years (Air 88%; Water 78%; Land 75%).

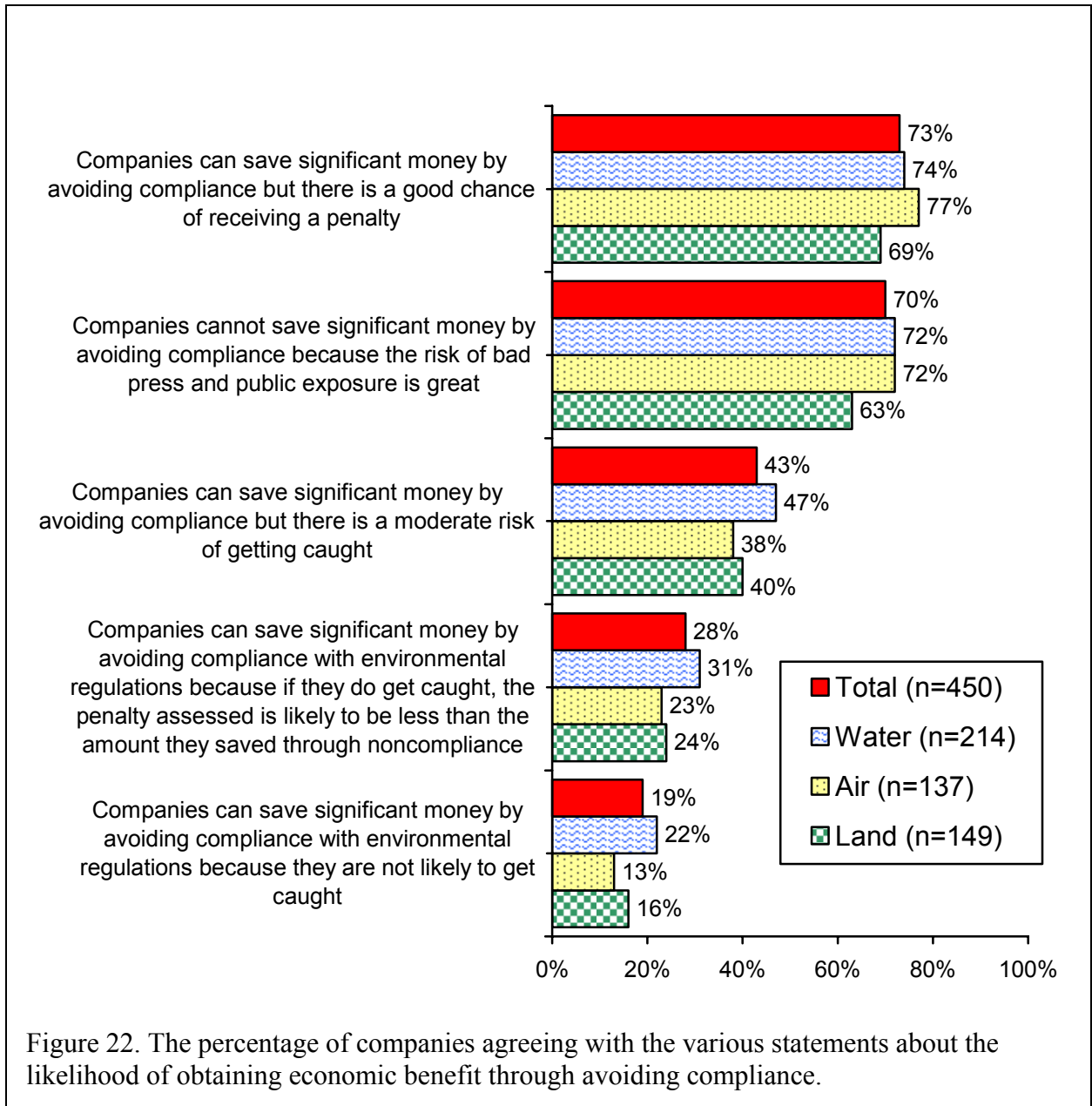
Respondents from companies previously penalized by DEQ are significantly more likely than those not penalized to be involved in making permit applications, modifications or reviews (7.9 vs. 4.5 times in the last 3 years) and requesting technical assistance from DEQ not related to permit application or inspection (4.8 vs. 1.9 times in the last 3 years).

***Can companies benefit economically by not complying?*⁵⁹**

Respondents rated their agreement or disagreement with a series of statements regarding compliance with environmental laws. The percentage agreeing (“strongly” plus “somewhat” agree) with each statement is presented in Figure 22 below.

Overall, most respondents agree that they have little chance of getting away with noncompliance regardless of how much money they can save. Less than three in ten (28%) agree that noncompliance is worth the risk because penalties are less expensive than compliance, and only one-fifth (19%) agree they are not likely to get caught. Companies of only 1-5 employees are significantly more likely to “strongly agree” that they can save significant money by avoiding compliance with environmental regulations because they are not likely to get caught.

⁵⁹ Company Survey question no. Q21.

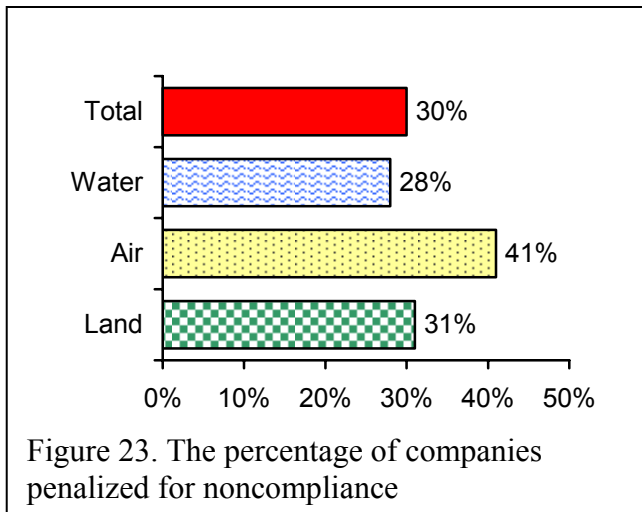


Nearly three-quarters (73%) agree that “companies can save significant money by avoiding compliance, but there is a good chance of getting caught,” and just over four in ten (43%) feel “companies can save significant money by avoiding compliance, but there is a moderate risk of getting caught.” Seven in ten (70%) agree that “companies cannot save significant amounts of money by avoiding compliance because the risk of bad press and public exposure is great.” Nearly three in ten (28%) agree that “companies can save significant money by avoiding compliance with environmental regulations because if they do get caught, the penalty assessed is likely to be less than the amount they saved through noncompliance,” and one-fifth (19%) agree that “companies can save

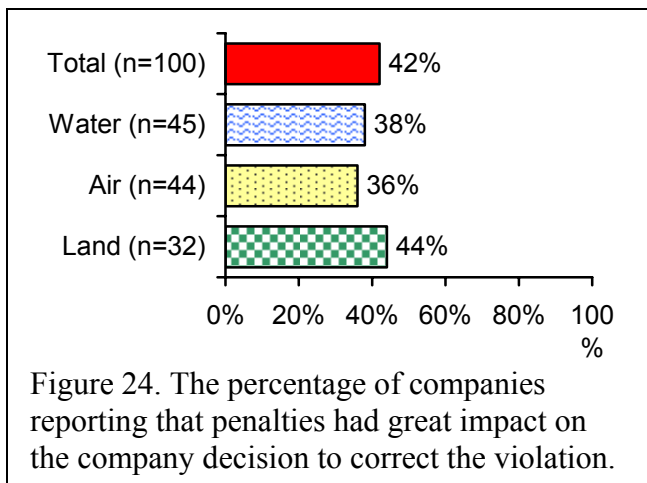
significant money by avoiding compliance with environmental regulations because they are not likely to get caught.”

Do penalties affect a company’s decision to correct a violation?

Approximately 30% of the companies surveyed report that they have been penalized for not following environmental regulations.⁶⁰ Figure 23 presents the percentage among companies in each of the programs surveyed that have ever been penalized for noncompliance.



Four in ten (41%) companies in the Air program have been penalized. This is heavily influenced by the high percentage of Title V companies that have been penalized (70%). As employee size increases, so does the likelihood that the company has previously been penalized for not following environmental regulations. Half (50%) of companies with 251 or more employees have been penalized, compared with 10% of companies with 1-5 employees, 22% of companies with 6-100 employees and 33% of companies with 101-250 employees.



Three-quarters (75%) of companies penalized for noncompliance report that they have corrected the violations (76% Water; 79% Air; 70% Land).⁶¹ Companies that have corrected the violation were next asked to rate the impact the penalty had on the company decision to correct the violation. Respondents rated the penalty’s impact using a seven-point scale where seven means “tremendous impact” and one means “zero impact.”⁶² The percentage rating the impact of the penalty at 6 or 7 for each of the programs is presented in the Figure 24 at left.

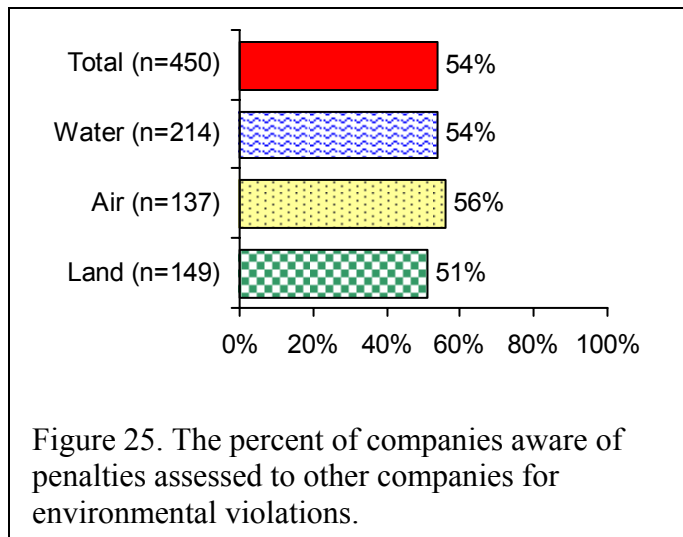
⁶⁰ Company Survey question no. Q22.

⁶¹ Company Survey question no. Q23.

⁶² Company Survey question no. Q24.

*Companies' awareness that others have been penalized?*⁶³

Respondents were asked if they are aware of any other companies in their industry or community that have been penalized by DEQ for not following environmental regulations. Overall, more than half (54%) of respondents are aware of other companies penalized.



Respondents from companies previously penalized by DEQ for not following environmental regulations are significantly more likely than those not penalized to be aware of other companies that have been penalized (62% vs. 50%, respectively).

Those companies aware of penalties assessed against others were asked which companies they remembered had been penalized, whether they are in the same industry, a similar industry, or a completely different industry and a series of questions about the penalty. The most commonly mentioned companies include Willamette Industries (5%),⁶⁴ Teledyne Wah Chang (4%),⁶⁵ Weyerhaeuser (3%),⁶⁶ City of Waldport (2%),⁶⁷ City of Portland (2%),⁶⁸ Spencer Environmental (2%),⁶⁹ Taylor Lumber (2%),⁷⁰ Cain Petroleum (2%)⁷¹ and Smith Frozen Foods (2%).⁷²

⁶³ Company Survey questions no. 25 through 30A.

⁶⁴ DEQ issued the following penalties to Willamette Industries: a November 1, 2001 penalty of \$15,600 for three violations relating to water pollution; a July 17, 2000 penalty of \$34,083 for 21 violations related to their wastewater permit; a July 8, 1999 penalty of \$1,500 for five violations related to their air contaminant permit; a March 17, 1995 penalty of \$65,040 for a continuing permit violation; and an April 26, 1996 penalty of \$19,132; and a July 6, 1992 order for hazardous waste violations.

⁶⁵ DEQ issued Teledyne Wah Chang the following penalties: a June 4, 2003 penalty of \$1,900 for two air contaminant permit violations; a March 16, 2001 penalty of \$50,000 for multiple violations; a December 26, 2000 penalty of \$5,400 for air contaminant permit violations; a December 1, 2000 penalty of \$20,000 for five violations related to discharging acutely toxic wastewater; an April 14, 2000 penalty of \$11,800 for discharging cyanide in violation of the wastewater permit; a November 1, 1999 penalty of \$23,000 for discharging cyanide in violation of the wastewater permit and causing a fish kill; a November 1, 1999 penalty of \$38,400 for four violations of the air contaminant permit; a December 21 1998 penalty of \$16,200 for five exceedances of the wastewater permit; a January 30, 1997 penalty of \$18,000 for five permit violations; a July 19, 1996 penalty of \$40,700 for six hazardous waste violations; a June 20, 1995 penalty of \$6,000 for violating an Order regarding emissions of gaseous chlorine; a January 12, 1995 penalty of \$1,100 for exceeding wastewater limitations; an August 12, 1993 penalty of \$20,400 for several hazardous waste violations; and an April 30, 1993 penalty of \$29,000 for operating without a valid air containment discharge permit.

⁶⁶ DEQ issued Weyerhaeuser the following penalties: a May 26, 1995 penalty of \$169,000 for air contaminant violations; a February 27, 1995 penalty of \$50,000 for air contaminant violations; a June 18, 1993 penalty of \$247,738 for violating air contaminant rules and permit; a February 25, 1993 penalty of \$900 for hazardous waste violations; a November 2, 1992 penalty of \$2,700 for hazardous waste violations; and a February 27, 1992 penalty of \$1,300 for hazardous waste violations.

Of all companies mentioned, four in ten (40%) are in a completely different industry than the respondent, 37% are in the same industry and 23% are in a similar industry. When asked what penalty each company in violation received, respondents were aware of a penalty in 63% of cases.

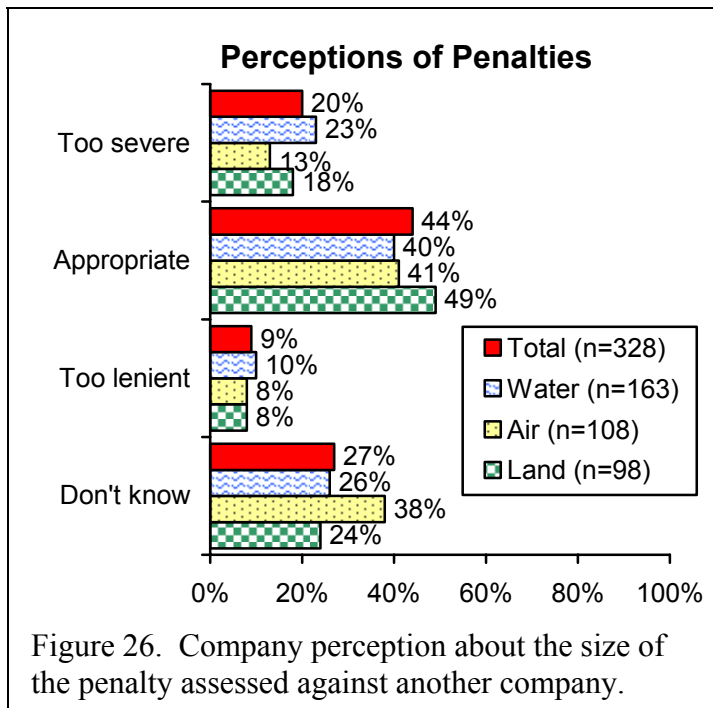


Figure 26. Company perception about the size of the penalty assessed against another company.

The median amount of dollar fines recalled was \$24,583 with 1% of the cases recalling dollar fines less than \$1,000 and 2% recalling dollar fines greater than \$1,000,000.

Half of the time (49%) respondents were aware the action was in violation, and 45% of the time they did not know.

Respondents were also asked if, at the time, they knew the action each company took was in violation, and if they believed the penalty was too severe, appropriate or too lenient (Figure 26). Respondents felt nearly half (44%) of penalties were appropriate, and only one-fifth (20%) felt the penalties were too severe.

Respondents aware of other companies in violation of environmental regulations

⁶⁷ Following a DEQ investigation, the City of Waldport pleaded guilty to in U.S. federal court in 1998 to a criminal violation of the Clean Water Act, receiving five years probation and a fine of \$2,500. In addition, DEQ issued to Waldport a September 30, 1992 penalty of \$1,800 for violating conditions of an Order.

⁶⁸ DEQ issued the following penalties to the City of Portland: a May 21, 2001 penalty of \$9,000 for discharging 2.5 million gallons of raw sewage; an April 24, 2001 penalty of \$5,700 for discharging raw sewage; a September 5, 2000 penalty of \$8,400 for discharging partially treated sewage; a September 5, 2000 penalty of \$5,100 for failing to report a by-pass within 24 hours; an April 8, 1999 penalty of \$4,200 for discharging raw sewage; a May 18, 1998 penalty of \$4,500 for discharging sediment; a November 26, 1997 penalty of \$1,700 for openly accumulating friable asbestos; an October 26, 1995 penalty of \$9,600 for discharging raw sewage; and a December 2, 1994 penalty of \$4,200 for discharging raw sewage.

⁶⁹ DEQ issued the following penalties to Spencer Environmental: a September 8, 2003 penalty of \$10,950 for seven violations involving hazardous waste and spilled oil; a February 22, 2001 penalty of \$13,200.00 for 3 hazardous waste violations; and an April 27, 1994 penalty of \$6,000 for discharging oil to a storm drain.

⁷⁰ DEQ issued an October 15, 1996 penalty of \$1,400 to Taylor Lumber & Treating, Inc. for three hazardous waste violations.

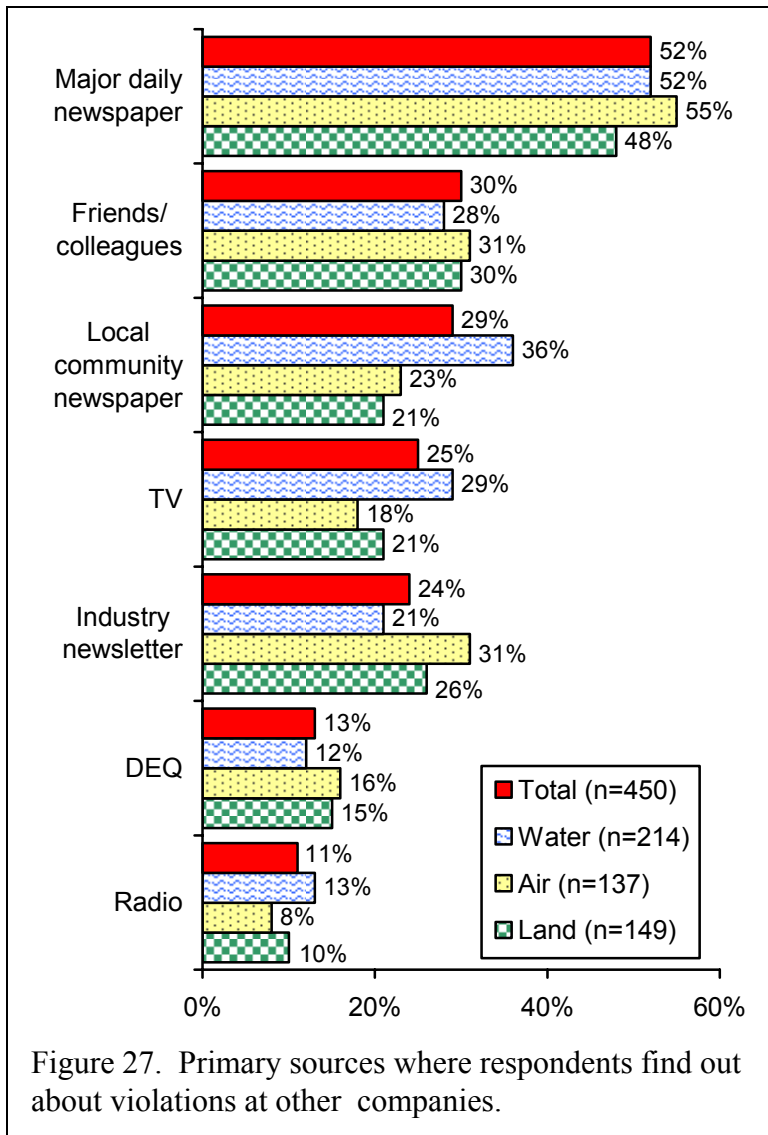
⁷¹ DEQ issued a May 15, 2002 penalty of \$1,428,720 to Cain Petroleum, Inc. for 15 violations related to releases of gasoline and diesel from underground storage tanks at nine properties.

⁷² DEQ issued the following penalties to Smith Frozen Foods, Inc. for unpermitted discharges of wastewater and consequent water quality violations: a March 5, 2001 penalty of \$6,000; a May 15, 1995 penalty of \$900; and a November 22, 1994 penalty of \$1,200. DEQ also issued a January 2, 1992 penalty of \$75,000 for an unpermitted discharge of wastewater to public waters occurring over a two week period that resulted in the death of thousands of fish and other organisms.

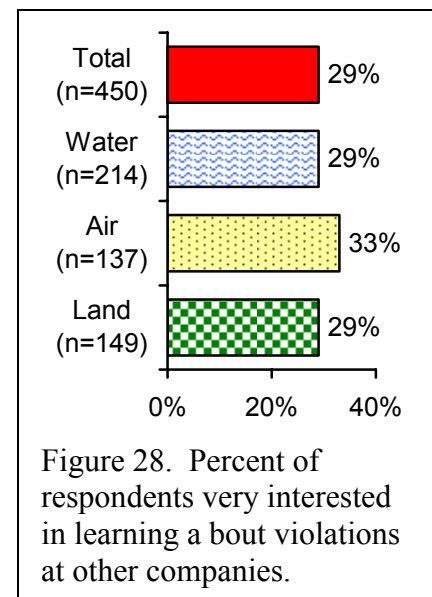
were asked what management, production and/or operational changes their company has made since learning about other companies' penalties for noncompliance. Three-quarters (74%) report that their company has made no changes since learning of other violations and penalties. "Employee awareness" (7%), "handling of hazardous waste" (7%), "investigating for noncompliance" (6%) and "better tracking and documentation" (3%) were the most commonly mentioned changes made resulting from learning of other companies' violations.

How do companies learn about violations at other companies?⁷³

Overall, half (52%) of respondents report learning about companies receiving penalties by reading major daily newspapers, and three in ten from friends or colleagues in the industry (30%) and local community newspapers (29%). Figure 27 shows where respondents learn of companies receiving penalties for noncompliance.



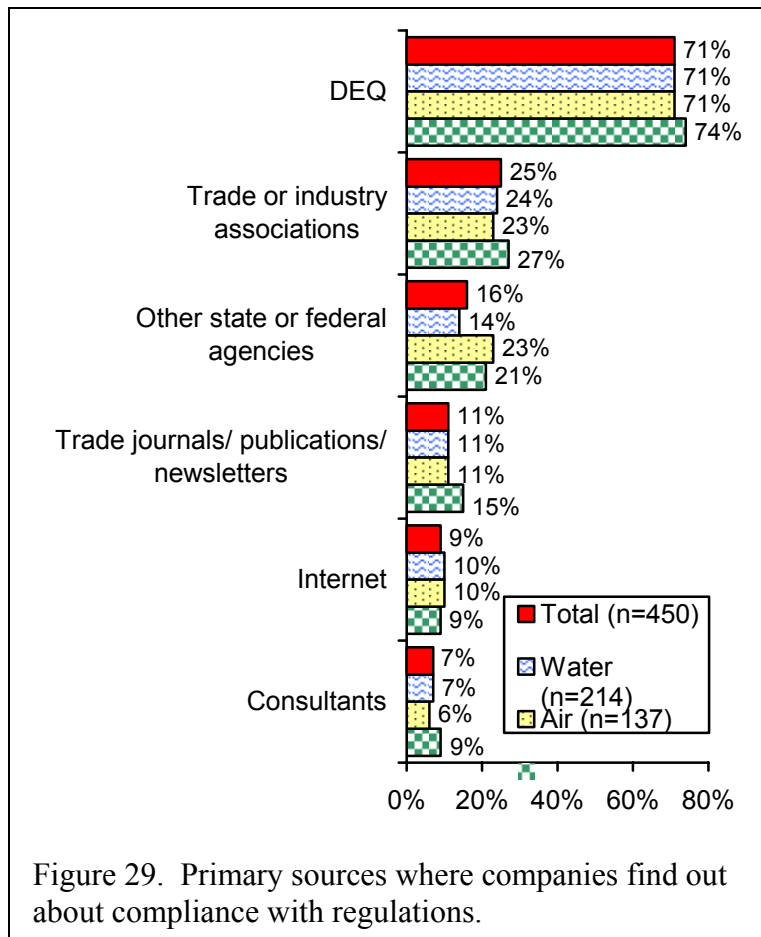
Major daily newspapers such as the *Oregonian* or the *Statesman Journal* are the most common method of learning of other companies penalized across all programs and employee size groupings. Respondents from companies with more than 20 employees are significantly more likely than smaller companies to learn of penalties through an industry newsletter (29% 21+ employees vs. 14% 6-20 employees and 8% 1-5 employees).



⁷³ Company Survey question nos. Q32 and Q33.

Respondents were asked to rate their interest in finding out when other companies violate environmental regulations using a seven-point scale where seven is “extremely interested” and one is “not at all interested.” Overall, three in ten (29%) respondents are highly interested. (See Figure 28 above showing “extremely” and highly interested in each of the programs.) Respondents from companies with more than 100 employees are significantly more likely to give high ratings to their interest in learning about the violations of other companies (35% vs. 25%, respectively).

Where do companies learn about compliance with regulations?⁷⁴



When asked “where do you typically obtain most of your information on compliance with environmental regulations?” 71% of respondents reported they turn to DEQ for this information. (See Figure 29 below).

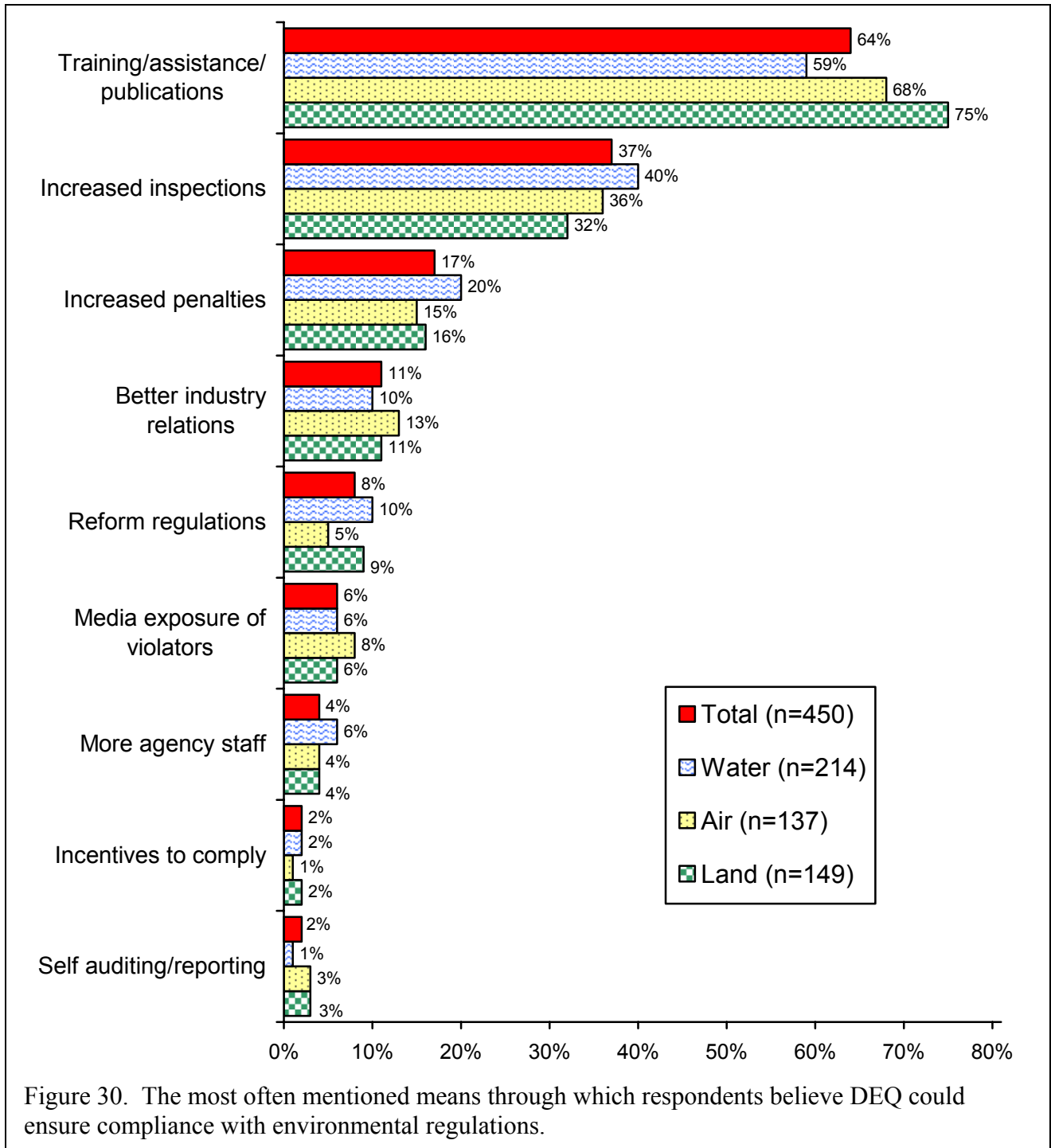
Those from the smallest companies are significantly less likely than larger companies to turn to trade or industry associations for information about compliance with environmental regulations (12% 1-5 employees vs. 27% 6+ employees, respectively).

What is the best way to ensure compliance?⁷⁵

Overall, “increased inspections” (37%) and “training and education” (36%) were the most commonly mentioned methods respondents believe would be the best way to ensure compliance with environmental regulations. When all responses suggesting assistance-type efforts are combined, including “training and education,” “technical assistance,” “newsletters” and “publications” the total was 64%. The top mentions of respondents are presented below.

⁷⁴ Company Survey question no. 36.

⁷⁵ Company Survey question nos. 34 to 36.



Overall, Respondents rated increased inspections and penalties and training/education as nearly equally effective at ensuring compliance. Respondents from companies not previously penalized chose inspections as the most-favored way to ensure compliance (38% with 30% preferring training/education). Respondents from companies previously penalized by DEQ are significantly more likely than those never penalized to prefer “training and education” (48% vs. 30%) and “work with businesses for compliance and technical assistance” (32% vs. 15%).

Survey of the General Public

One hundred respondents were surveyed in each of DEQ's three regions. Of the total, most were rural (45%), with fewer in suburban and urban areas (29% and 26% respectively).⁷⁶ The majority (52%) of respondents from the Eastern Region were rural (21% suburban; 14% urban). Western Region also had a large portion (38%) of rural respondents (24% suburban; 36% urban). The majority of Northwest Region respondents were suburban (55%) or urban (50%) with very few rural (10%). Forty-five percent of the respondents were male and 55% were female. Only 8% were members of any environmental group. Respondents averaged 49 years of age⁷⁷ and 34% had completed college.⁷⁸ Respondent's household income level averaged about \$40,000.⁷⁹

*Are members of the general public personally interested in pollution prevention?*⁸⁰

Respondents appeared to be interested in properly managing their own wastes. Although only 24% were aware of any programs designed to inform Oregonians about materials or activities that can be harmful to the environment and about how to prevent pollution, 61% would visit a local community office to obtain pollution prevention information from an expert at least once per year – 20% would use it every month. Three-quarters of those surveyed who disposed of automotive fluids, painting products, and fertilizers/pesticides in the last two years recycled those materials (77%, 74%, and 71% respectively). Furthermore, more than half report that they would contact someone to find out if the item required special disposal or would take it to a local disposal or recycling facility (53% and 37% respectively).

Respondents were asked what would cause them to change their method of disposal after learning that a disposal method they were using is harmful to the environment. The overwhelming reason for changing, or considering changing, improper disposal methods is “concern over the environment” (84%). Six percent (6%) say “concern over facing a fine if you got caught” and 1% say, “concern over what others might think if they found out.” Less than one in ten (8%) have “never been in the situation.” Respondents aware of environmental programs are significantly more likely than those not aware to change or consider changing behavior out of “concern for the environment” (90% vs. 78%, respectively).

⁷⁶ Question D1 asked “Would you consider the area you live in to be urban, suburban, or rural?”

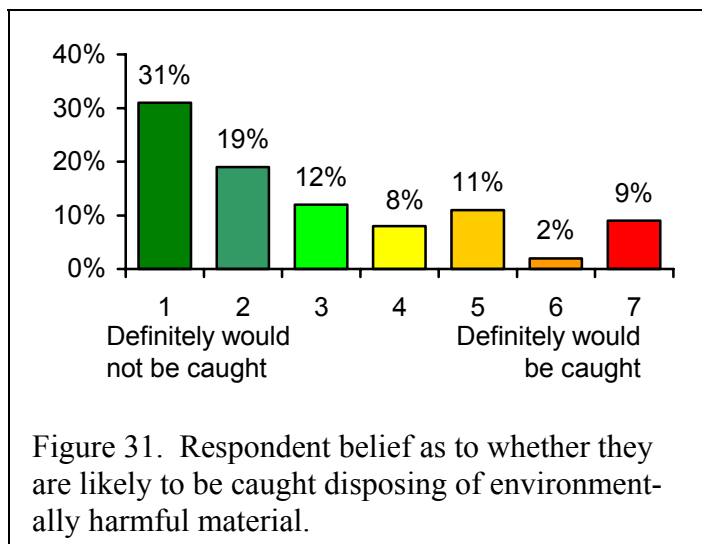
⁷⁷ Ages: 18 to 24 (4%); 25 to 34 (16%); 35 to 44 (19%); 45 to 54 (24%); 55 to 64 (18%); 65 or older (17%); refused (1%).

⁷⁸ Less than high school (7%); completed high school (25%); some college/associates/vocational (33%); completed 4-year college (21%); some graduate school (4%); completed graduate degree (9%).

⁷⁹ Less than \$20,000 (14%); \$20,000 to \$40,000 (28%); \$40,000 to \$60,000 (23%); \$60,000 to \$80,000 (15%); \$80,000 to \$100,000 (4%); \$100,000 to \$120,000 (4%); \$120,000 or more (2%); refused (10%).

⁸⁰ Public Survey question nos. Q1 to Q13A.

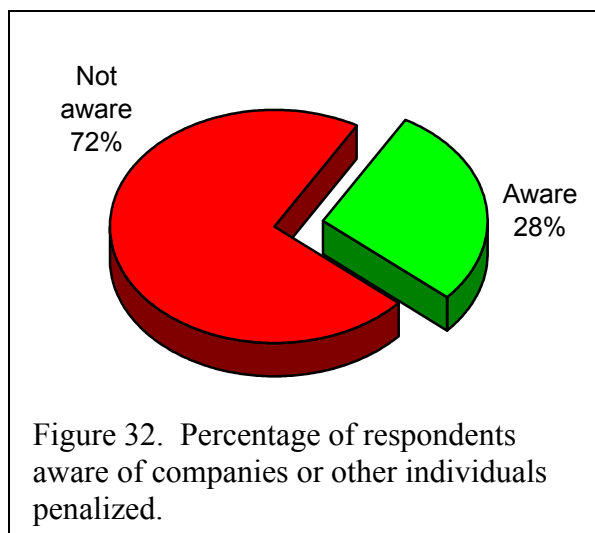
What is the likelihood that members of the general public would be caught in violation?⁸¹



Respondents rated the likelihood of getting caught and penalized if they were disposing of an environmentally harmful material against regulations for some reason, using a seven-point scale where seven means “definitely would be caught” and one means “definitely would not be caught.” (See Figure 31 at left.)

Half of the respondents feel they are highly unlikely to be caught disposing of environmentally harmful material. Only one in ten feel they are highly likely to be caught. Men are significantly more likely to believe they would not be caught (62% vs 40%).

Are members of the general public aware of violators?⁸²



Respondents were asked if they are aware of any companies or individuals in their community that have been penalized for not following environmental regulations. Those aware were asked which companies or individuals have been penalized, the type violation, and a series of questions about the penalty. Overall, nearly three in ten (28%) respondents are aware of companies or individuals penalized. (See Figure 32.) Respondents older than 35 are significantly more likely than younger respondents to be aware of companies or individuals that have been penalized (32% 35+ years old vs. 15% 18-34).

Companies account for nearly all known violators (96%). The most commonly mentioned companies include Wah Chang (5%),⁸³ Hyundai (3%),⁸⁴ Ross Island Sand and Gravel (3%)⁸⁵, Weyerhaeuser (3%),⁸⁶ Ore-Ida (2%)⁸⁷ and Georgia Pacific

⁸¹ Public Survey question no. Q13.

⁸² Public Survey question nos. Q14 to Q20.

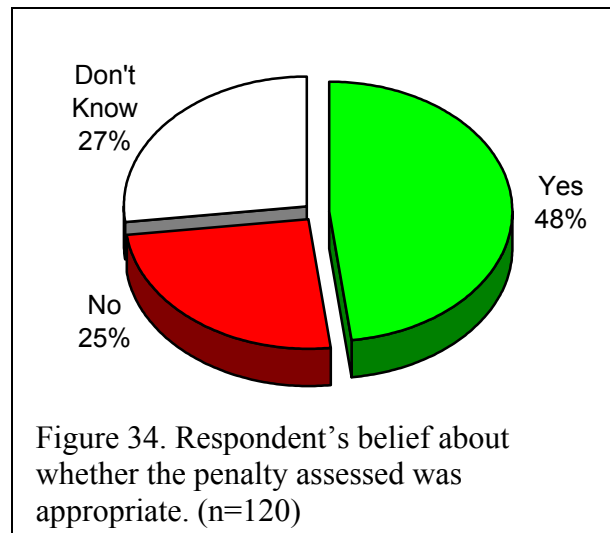
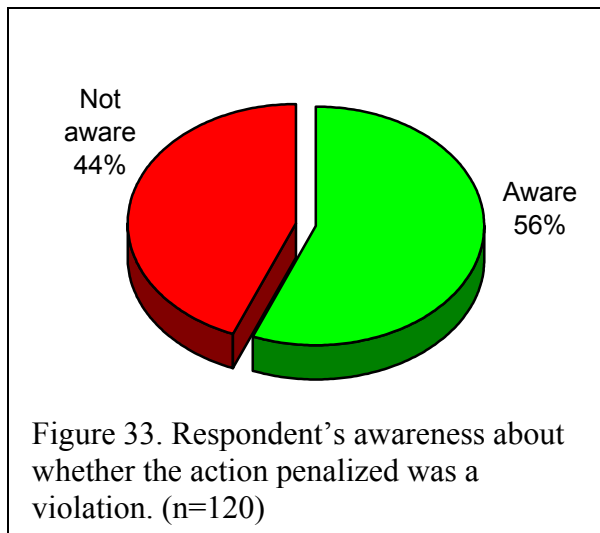
⁸³ See *supra* footnote 65.

⁸⁴ DEQ issued Hyundai Semiconductor America a September 26, 1996 penalty of \$1,600 and second penalty of \$14,400 for violating terms of its wastewater permit.

⁸⁵ DEQ issued Ross Island Sand & Gravel Co, an April 23, 1999 penalty of \$31,707 for unpermitted disposal of solid waste.

(2%).⁸⁸ Of all penalties recalled, half (48%) are for water pollution, 34% are for hazardous waste handling or storage and 11% are for air pollution. When asked what penalty each company or individual received, respondents were aware of the penalty in 59% of cases. The most common penalties recalled are dollar fines, mentioned for 53% of cases. Other penalties include forced shut downs (2%) and warnings (1%). In 70% of cases, those who recall a dollar fine did not know the amount of the dollar fine. The median amount of dollar fines recalled was \$54,168.

Respondents were also asked if, at the time, they knew the action each company or individual took was in violation, and if they believed the penalty was appropriate. Figures 33 and 34 below present the percentage of cases where respondents knew the actions were in violation of environmental regulations and the percentage of cases where respondents felt penalties were appropriate.



More than half of the time (56%) respondents were aware the action was in violation. Respondents felt half (48%) of penalties were appropriate, and one-quarter (25%) felt the penalties were not appropriate.

Respondents were asked where they learned that these companies or individuals received a penalty. Newspapers made up the most common sources of information about penalties, with local community newspapers making up 47% of sources and major daily newspapers accounting for 26%. Those living in Northwest Region are significantly more likely to turn to major daily newspapers (48% Northwest Region; 17% Eastern Region; 15% Western Region), while those in Eastern and Western Regions are significantly more likely to turn to local community newspapers (62% Eastern; 56% Western; 22% Northwest).

⁸⁶ See *supra* footnote 66.

⁸⁷ DEQ has not issued any penalties to Ore-Ida Foods. On 10/31/96 DEQ issued a “notice of permit violation” for unpermitted discharge of waste water, but those are not generally reported in the media.

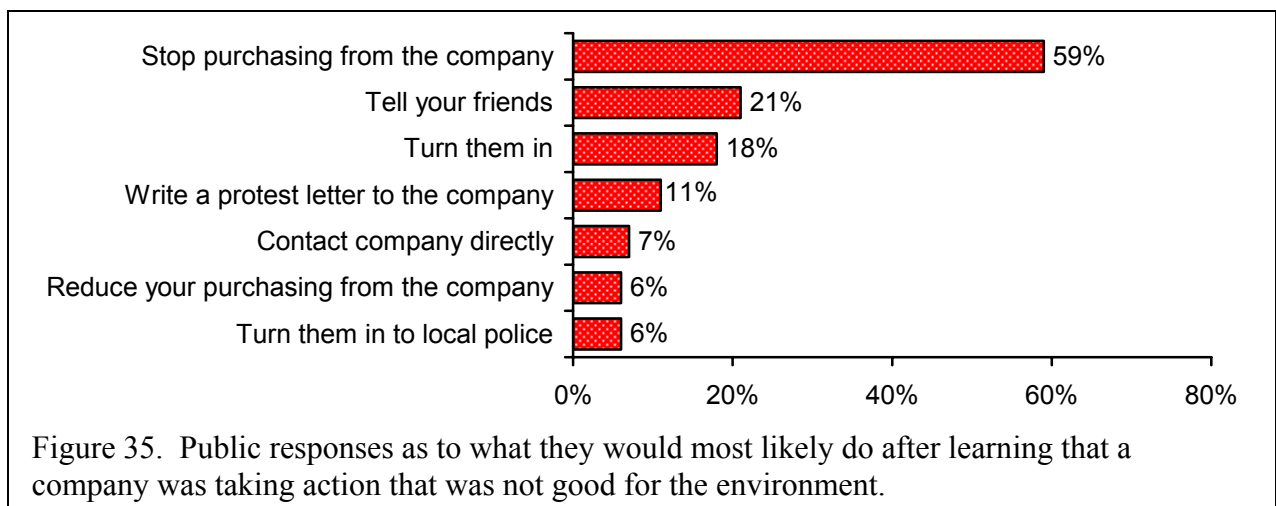
⁸⁸ DEQ issued to Georgia-Pacific West a May 30, 1995 penalty of \$800 for a hazardous waste violation.

Does hearing about penalties cause the public to change how they handle environmentally harmful materials?⁸⁹

When asked whether learning of penalties changed how the respondent handled materials known to be environmentally harmful using a seven-point scale where seven means “drastically changed” and one means “no change” 60% of the respondents said there was no change⁹⁰ and 13% said there was a drastic change. Of those respondents who had learned of penalties, 81% said the penalties “impacted their behavior” because they were concerned for the environment (summary of responses saying “It’s bad to contaminate the environment,” “I don’t put hazardous/harmful pollutants into the environment,” and “Concern for our children/future”). Four percent said it had changed their behavior because they “don’t want to get fined.” Eight said it did not change their behavior. Men are significantly more likely than women to say learning of penalties assessed against noncompliant companies “did not affect my behavior” (14% vs. 2%, respectively).

Does hearing about a company penalty affect how the public deals with that company?⁹¹

Respondents were asked what they would do if they learned a company they buy from was taking an action that was not good for the environment. Results are shown in Figure 35 below.



Six in ten (59%) Oregon residents said they would “stop purchasing from the company” if they determined that some environmental harm was being caused by the company. Other actions that respondents would take are “tell your friends” (21%), “turn them in” (18%), and “write a protest letter to the company” (11%). Women are significantly more likely than men to actively work to impact the companies’ sales by “not purchasing from the company” (65% vs. 50%) and “telling friends” (26% vs. 15%).

⁸⁹ Public Survey question nos. Q21 to Q22.

⁹⁰ Most respondents stated they were already handling environmentally harmful materials properly.

⁹¹ Public Survey question nos. Q23 to Q28.

Respondents were asked how likely individuals and companies would be to change their behavior after learning that someone else was improperly disposing of environmentally harmful materials. Half (51%) of respondents would be highly likely to or definitely would reduce their patronage of a company that was fined for violating an environmental regulation. One-quarter (26%) believe that Oregon companies would be highly likely to, or definitely would, begin to properly dispose of harmful materials after hearing about a penalty. One-quarter (25%) said that individuals would be highly likely to or definitely would change their own practices after hearing that penalties were given to other individuals for environmental violations.

What are the chances that a member of the public would report an environmental violation?⁹²

Oregon residents were also asked about the likelihood that they would report a violation if they discovered a company was illegally disposing of environmentally hazardous material, and if they would report a violation for a company they work for, that was disposing of environmentally hazardous material improperly. Three-quarters (77%) said they would be highly likely to or definitely would report a company if it was committing a violation. Almost two-thirds (63%) said they would be highly likely to or definitely would report the company that employs them if it were disposing of a hazardous material illegally.

DISCUSSION

Oregon Citizens Care about the Environment

Oregon has a national reputation as an environmentally progressive state. It was the first to enact a “bottle bill” requiring a deposit for beverage containers to encourage recycling, and has one of the most successful plastic recycling programs in the country. In the survey, three quarters of the public respondents who disposed of automobile fluids, paint products, fertilizers or pesticides in the last two years had recycled the materials rather than disposing of them. More than half say they would seek information to find out if a waste they possess might require special disposal to protect the environment and over 80% would change their disposal method upon discovering that their current method is harmful to the environment. Another recent survey reported that 11% of Oregon citizens value environmental quality and a clean environment above all other community characteristics.⁹³ That survey also reported 69% of the public believe that economic growth in Oregon can be best promoted by maintaining the quality of the environment to attract people and companies, compared to only 22% who believe that relaxing regulations to make it easier to do business here would better promote economic growth.⁹⁴ While 77% think Oregon is doing a good job of maintaining clean air and water, 91% remain concerned about water quality protection, 80% are concerned about air quality protection, and 68% are in favor of strengthening environmental regulations.⁹⁵

⁹² Public Survey question no. Q26.

⁹³ DAVIS, HIBBITTS & MIDGHALL, INC., OREGON ATTITUDES ABOUT ENVIRONMENTAL QUALITY AND NATURAL RESOURCES, presentation to the Governor’s Natural Resource Advisors (Mar. 17, 2004), available at www.oregonvalues.org.

⁹⁴ *Id.*

⁹⁵ *Id.*

Upon learning that a company they do business with is taking an action that is not good for the environment, most Oregon residents would stop purchasing from the company and many would tell their friends, turn the company in, write a protest letter to the company, contact the company directly, reduce purchasing from the company, or turn the company in to police. These public values and attitudes are not limited to the relatively “liberal” populations in the Portland area of the state (the northwest corner); the study found that the more “conservative” populations on the eastern side of the state were almost as likely to stop purchasing from the company as the residents in the Portland area (52% versus 63%). Furthermore, residents in the eastern region were more likely to turn the company in to police or contact their state legislators. Eastern residents were also at least as likely to reduce patronage of a company which had been fined for environmental violations and to report a company if they discovered it illegally polluting. Eastern residents were more likely than any others in the state to report illegal pollution by the company for which they work. Thus, it appears that people of different philosophical leanings are equally interested in the quality of their environment and believe that companies have an obligation to comply with the regulations designed to protect it. The pressures they could bring to bear are likely strong incentive for a company to work to maintain compliance.

Much of the Regulated Community Makes Environmental Compliance a Priority

Two thirds of the respondents claim their companies typically make decisions to *assure* compliance with environmental laws and encourage internal efforts to reduce pollution. The result – that companies make environmental concerns a priority – is also supported by other actions the companies have taken. First, companies tend to integrate environmental compliance considerations in the early stages of designing new management, operation or production processes. Two thirds consider environmental compliance during the initial concept design stage and most of the rest consider environmental compliance during the development phase before implementation. Only 6% wait until after implementation to consider environmental compliance and only 2% fail to consider environmental compliance until receiving a Notice of Noncompliance or penalty.

Second, companies assign responsibility for environmental compliance high in the company leadership where the most important company decisions are to be made. Most companies assign responsibility for environmental compliance to executive managers (owner, board of directors, president, vice president, general manager). Many companies, especially larger companies, have a specially designated environmental manager. If a penalty were to be assessed for an environmental violation, 99% of the companies say upper management would be involved to allocate resources to fix the problem, 99% say upper management would be involved to direct an effort to attain compliance, 95% say upper management would be involved to address public perception, 94% say upper management would be involved to educate staff, and 91% say upper management would be involved to discipline staff.

Another indicator that companies place a high priority on environmental compliance is the companies’ history of making changes in management, production or operations processes that

involve environmental compliance. Approximately half of the companies surveyed had recently made these kinds of changes. Of this half, 39% made changes to comply with changes in the law and 22% made changes for reasons of environmental awareness or protection of the environment. These two reasons are the most-often mentioned reasons for the changes, suggesting that most of the changes being made are done proactively for non-enforcement reasons, demonstrating a prevalent pro-compliance pro-environment company mentality.

Does Deterrence Exist and Can It Be Quantified?

Specific deterrence

Changes in behavior directly resulting from enforcement actions are easily identified from the data. When asked what led the companies to make changes they had recently made in management, production or operational changes, 11% of all companies volunteered that “DEQ enforcement” was at least one of the reasons. It is clear that enforcement creates “specific deterrence” to future violation for some facilities. Two percent of the companies said that they do not consider environmental compliance during development of a new management, operation or production process. Instead, these companies say they wait for a Notice of Noncompliance or penalty to drive compliance. Five percent of the companies admit that, in their operations, they “do not work toward compliance and deal with environmental matters as problems arise or after receiving a Notice of Noncompliance.” Enforcement may be the only way to bring these companies into compliance because they are not even taking the first steps toward compliance by educating themselves about what changes might be legally required, easy to implement, or cost effective.

Furthermore, companies that have been penalized tend to work harder to remain in compliance. This may be because previously penalized companies are significantly more likely to believe that DEQ “would definitely find out” about both significant and less significant violations. Previously penalized companies are almost twice as likely to have submitted permit applications or modifications, almost three times as likely to request technical assistance from DEQ not related to a permit application or inspection, and significantly more likely to make process changes for environmental reasons. They are over three times more informed about inspections and penalties against other companies and over two times more likely to have learned about technical assistance at other companies. They are significantly more likely to have made changes after learning about inspections, penalties or technical assistance at other companies. It appears that, once penalized, companies make compliance a higher-priority job duty as well – if found in noncompliance, upper management of previously-penalized companies are significantly more likely to discipline staff.

Table E below compares estimates for the numbers of changes companies made to manufacturing or operating processes directly resulting from different kinds of DEQ action in the past three years. The Table shows the percent of companies reporting that they had technical assistance, inspections, and enforcement from DEQ, the average number of DEQ actions per company and an estimate of the average number of resulting changes. According to these estimates, many more companies are contacted through inspections than through technical assistance or penalty actions. Not all inspections identify compliance problems, resulting in a higher average number of improvements per

company for technical assistance than for inspections. Direct technical assistance appears to have a greater effect in creating compliance than inspections and penalties combined.⁹⁶

Table E. Comparison of changes companies made to manufacturing or operating processes directly resulting from DEQ action in the past three years: (A) Types of DEQ action: technical assistance, total enforcement (inspections & penalties), inspections, and penalties; (B) The percent of companies having these actions; (C) The average number of DEQ actions per company for all companies; and (D) The average number of changes per company for all companies as a direct result of DEQ action.

(A)	(B)	(C)	(D)
Type of DEQ action	% having DEQ action ⁹⁷	Avg. # DEQ actions per company ⁹⁸	Avg. # changes per company
Technical assistance	50%	2.8	2.24 ⁹⁹
Total enforcement	≥79%	4.3	1.62 ¹⁰⁰
Inspection	79%	4.1	1.47 ¹⁰¹
Penalties	13%	0.2	0.15 ¹⁰²

It is often assumed that companies are driven by the dollar value of penalties.¹⁰³ The data presented above on specific deterrence do not necessarily support that conclusion. While it appears that

⁹⁶ It is not known how long companies sustain these improvements or work to remain in compliance after a compliance communication with the regulatory agency. In a study of hazardous waste generators, a Washington study found that compliance tended to remain high until the fifth year after an inspection at which time compliance began to significantly deteriorate. WASHINGTON DEPARTMENT OF ECOLOGY, ANALYSIS OF CHANGE IN GENERATOR COMPLIANCE USING REGULATORY COMPLIANCE INDICATORS, FINAL PROJECT REPORT (April 11, 2002) available at <http://www.epa.gov/compliance/resources/reports/stag/fy2000/stag00-wa-generator-final.pdf>. Regarding recidivism following penalty, in the experience of the author, many companies that have received a penalty violate again. However, this is likely a consequence of the sorting process in which a company is targeted for penalty rather than the penalty itself, that is, companies receiving penalties are more likely to have a corporate attitude that makes them more likely to re-violate.

⁹⁷ Company Survey questions Q18C (technical assistance), Q19A (inspection), Q19C (penalties).

⁹⁸ *Id.*

⁹⁹ Assuming an average compliance rate of 80% as derived from three previous DEQ studies measuring how many facilities accept and adopt compliance recommendations given through technical assistance (1996 Action Form Pilot Project, 81%; 1997 A-3 Channel SWAMP which is available at www.deq.state.or.us/wr/LocalProjects/A-3%20Channel/A-3%20Results.htm, 79%; 1998-2000 Calapooya and Sutherlin Creek Watershed Project, 80%) as reported in *Field Activities Tracking Study (FATS), Final Report*, Western Region, DEQ, unpublished manuscript (copy on file with author).

¹⁰⁰ Sum of inspection plus penalties.

¹⁰¹ Derived from Company Survey question Q19B (0.8 Notices of Noncompliance per company in the last three years) times 1.84 (the average number of violations identified per inspection), and assuming DEQ obtains nearly 100% compliance either as a result of inspection or follow-up enforcement.

¹⁰² Company Survey question Q23 (75% penalized companies report changes resulted from penalty).

¹⁰³ *E.g.*, the U.S. Supreme Court opined that “a defendant once hit in its pocketbook will surely think twice before polluting again.” *Friends of the Earth v. Laidlaw Env'tl. Servs.*, 528 U.S. 167 (2000).

previously penalized companies try harder to comply, the dollar value of the penalty itself may be less a driver for deterrence than other secondary impacts that accompany the penalty action. This is further discussed in the section on severity below.

General Deterrence

Measuring the indirect effect that enforcement actions have on companies not directly targeted for the enforcement action (*i.e.*, “general deterrence”) is considerably more challenging. Because general deterrence occurs only in the minds of people who then decide not to do something which they should not have done anyway, general deterrence is an extremely ephemeral phenomenon. Nonetheless, the survey did find evidence of general deterrence.

A minor piece of evidence is that one percent of the companies making recent changes to management, operation or production processes volunteered that they made the recent changes simply because they had become aware of enforcement against other companies. However, when companies were asked specifically how many changes their company had made in the past three years as a result of DEQ penalties against other firms, 14% of the companies reported making such changes. The data indicate that penalties can be a decisive factor in stimulating some changes at some facilities and a contributing factor for others.

Companies are also deterred by hearing about inspections. An additional 38% of all companies reported that, after hearing about DEQ inspections at other companies, they made changes to their management, operation or production processes. One interpretation of this might be that inspections are more effective in creating general deterrence than penalties. Similar findings have previously been reported by other researchers.¹⁰⁴ However, the effects of inspections and the effects of follow-up enforcement may be difficult to completely divorce because, as discussed below, data suggests general deterrence of inspections likely results from secondary impacts of inspections including penalties.

The amount of deterrence created by inspections will likely differ depending on what kind of inspection it is. The current survey did not ask respondents to distinguish between the various detection methods (*i.e.*, voluntary self-disclosure, required self-monitoring reporting, compliance inspections, or complaint investigations). However, one researcher reviewed U.S. Coast Guard data regarding port spills and found that a 10% increase in direct monitoring of oil transfers reduced oil spills by 1.7%, a 10% increase in random patrols to detect spills resulted in a 2.0% reduction, and a 10% increase in compliance inspections did not reduce oil spills.¹⁰⁵ While these results obviously may not be extended to all kinds of inspections, it is clear that agencies should evaluate the manner in which they attempt to detect violations and tailor the program to create the best environmental return.

¹⁰⁴ Harford, J.D., *Violation Minimizing Fine Schedules*, ATLANTIC ECONOMIC JOURNAL, 15(4):49-56 (1987).

¹⁰⁵ Cohen, Mark A., *Monitoring and Enforcement of Environmental Policy* in INTERNATIONAL YEARBOOK OF ENVIRONMENTAL AND RESOURCE ECONOMICS, III (Tom Tietenberg & Henk Folmer, eds. 1999).

A better way to quantify the general deterrence effects of enforcement is to compare the sum of the combined effects of inspections and penalties against the sum of the various technical assistance programs and initiatives. (See Table F) In this comparison, the average company hears about enforcement at other companies over four times more often than it hears about technical assistance at other companies. Reasons for this difference are unknown, but may include better publicizing of enforcement, less company interest in technical assistance, or both. In looking at the “efficiency” of the DEQ action in stimulating changes at non-target companies (*i.e.*, the likelihood that a non-target company will make changes after hearing about either enforcement or technical assistance at a target company), technical assistance appears more efficient than either inspections or penalties (46% vs. 43% and 17% respectively). But, when inspections and penalties are combined, the overall efficiency of enforcement is greater than technical assistance.

Table F. A comparison of the changes companies made to manufacturing or operating processes as a direct result of hearing about DEQ action at another facility in the past three years: (A) Type of DEQ action: technical assistance, total enforcement (inspections plus penalties), inspections, and penalties; (B) The percent of companies having heard about the DEQ action at other facilities in the past three years; (C) The average number of times the companies heard of these actions in the last three years; (D) The percentage of companies making changes as a direct result of hearing about these actions; (E) The average number of changes made per occasion of hearing about the activity; and (F) the average number of changes all companies made as a direct result of hearing about the DEQ action.

(A) Type of DEQ action	(B) % having heard about DEQ action ¹⁰⁶	(C) Avg. times heard ¹⁰⁷	(D) % of those hearing making changes ¹⁰⁸	(E) Avg. # changes per time heard ¹⁰⁹	(F) Avg. # changes per company ¹¹⁰
Technical assistance	71%	8.4	46%	0.13	1.1
Total enforcement	≥88%	37.5	60%	0.07	2.6
Inspection	88%	20.9	43%	0.10	2.1
Penalties	84%	16.6	17%	0.03	0.5

Given that the average company hears about many more enforcement actions than technical assistance, enforcement appears much more effective at creating changes in the regulatory community. For example, during the three years preceding the survey, companies report making an

¹⁰⁶ Company Survey questions. Q16B (technical assistance), Q16A (inspections), Q16C (penalties).

¹⁰⁷ *Id.*

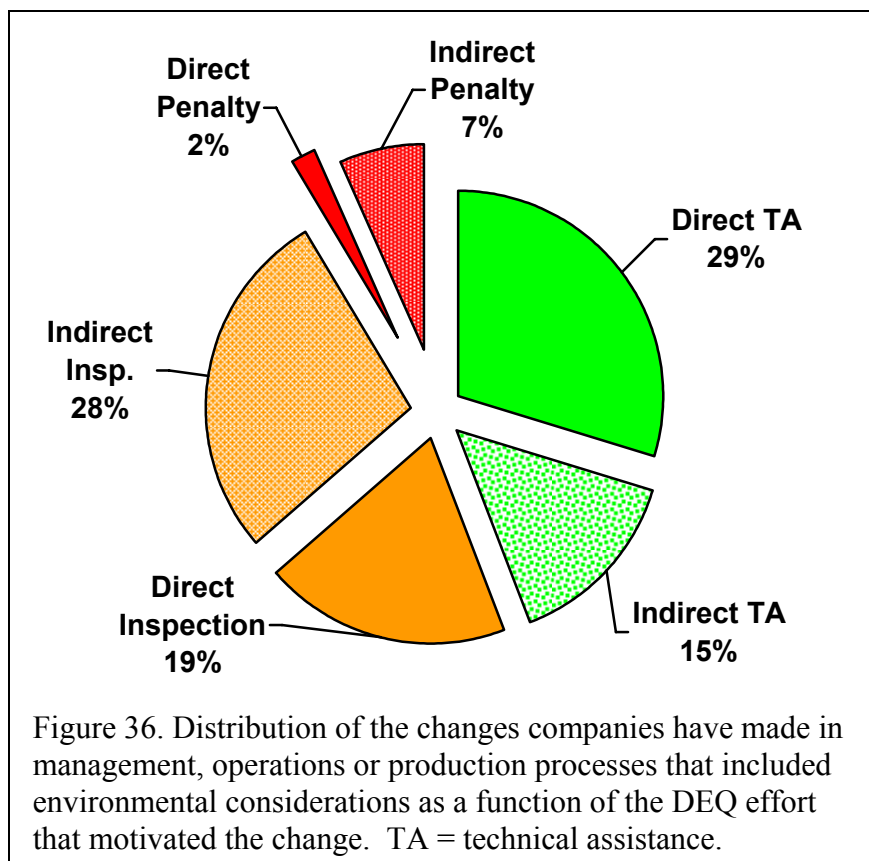
¹⁰⁸ Percent making changes divided by percent having heard about DEQ action. Company survey questions Q16B and Q17B (technical assistance), Q16A and Q17B (inspection), and Q16C and Q16C (penalties). Total enforcement equals inspections plus penalties.

¹⁰⁹ Average number of changes divided by average times heard.

¹¹⁰ Company Survey question no. Q17B (technical assistance), Q17A (inspection), Q17C (penalties). Total enforcement equals inspections plus penalties.

average of 2.6 changes to manufacturing, production or operation processes as a direct result of hearing about inspections and penalties at other companies, but only 1.1 changes as a result of hearing about technical assistance.

Using data from Tables E and F one can estimate the contribution of the various DEQ actions to stimulating environmental compliance-related changes in the company's processes. (See Figure 36.) The data indicate that, during the preceding three years, technical assistance efforts *directly* stimulated 29% of the total changes made by companies with another 15% attributed to companies making volitional changes as a result of hearing about technical assistance at other companies. The direct action of inspections stimulated 19% of the compliance changes made by all companies and indirectly simulated changes accounting for another 28% of the total. Technical assistance and inspections contributed about equally to the total number of changes companies have made. However, technical assistance appears to be more effective with direct contact, while inspections motivate more changes indirectly at non-target companies than at the companies actually inspected. One reason for this may be that fewer companies hear about technical assistance at other companies than inspections at other companies. Penalties create over three times more indirect effects than target effects, supporting a widely held conviction that penalties deter violation at other companies. Nonetheless these data point out the likely importance of both enforcement processes and technical assistance efforts.



What important factors create deterrence?

The classical theory of deterrence suggests that there are three critical factors necessary to creating general deterrence through enforcement. These are *certainty* that noncompliance will receive penalty, sufficient *severity* of the penalty as to cause concern, and having the penalty be imposed promptly after the violation (*celerity*). In addition, the regulated entity must understand the risks created by these factors and act rationally and accordingly. An assessment of DEQ's enforcement program relative to these factors is discussed below.

Certainty

For the three years preceding the survey, 79% of the companies report that they had been inspected, 36% report receiving a Notice of Noncompliance,¹¹¹ and 13% report receiving a penalty for violations. Thirty percent report having received a penalty from DEQ at some time. It appears that the strategies DEQ uses to target noncompliance through these enforcement actions are successful in creating general perception that there is a high certainty that violations will be discovered. Seventy percent of all companies believe DEQ would almost definitely find out about significant violations; and 41% believe DEQ would almost definitely find out about less significant violations as well. Three quarters or more of the companies believe a significant amount of money can be saved by avoiding compliance, but they also believe there is a “good chance of receiving a penalty” when caught. Furthermore, most believe the penalty would eliminate the monetary gain of noncompliance.

Six percent of the companies believe that DEQ is unlikely to even find out about significant violations and 19% believe that companies can save significant money by avoiding compliance because they are not likely to get caught. It is not clear why some companies assess their risk of penalty so differently than others. One might speculate that different regulatory programs have different requirements which might be easier or harder to conceal from DEQ. But, in fact, companies regulated by DEQ’s Water, Air, and Land programs reported nearly the same spectrum of perceived likelihoods of penalty for both significant and less significant violations. (See Figure 14.)¹¹²

The variability in perceived risk appears to be less related to DEQ’s implementation of its inspection and enforcement program than to its success in conveying the risks to the regulated community. This is illustrated by those companies which should be in the best position to evaluate that risk – those previously receiving penalties. These companies are significantly more likely to believe that DEQ would definitely find out about both significant and less-significant violations. Conveying to the non-target companies information about enforcement at other companies so that the non-target companies can better evaluate the risk has been and continues to be a challenge. When asked about their level of interest in learning about enforcement at other companies, less than 50% were even moderately interested and 15% were “not at all interested.” Furthermore, it is difficult to know how to get that information to the non-target companies. Companies report that, by far, the single most significant source of information about enforcement at other facilities is the daily newspaper. DEQ is often able to attract reporters to the “big” enforcement stories having large penalties, but most enforcement remains unreported in the common media. Indeed, when asked what would be the best way to ensure compliance, 6% of the companies suggested making violators more known to the media and the public. This lack of exposure to information is likely an important contributing factor

¹¹¹ A Notice of Noncompliance is a warning letter, required by rule, whenever DEQ documents any violation of its environmental statutes, rules, permits and orders. It is not appealable and, although it often asks that certain steps be taken, it does not establish legally-binding requirements.

¹¹² Companies in the Hazardous Waste program report lower perceived likelihood of getting caught than those in the Air or Water programs, which may be attributed to the lower self-reporting burden in that program, or to the lower frequency at which hazardous waste facilities are inspected.

leading some companies, especially small companies, to presume a lower risk or certainty of enforcement.

Severity

Determining a proper penalty amount for violations is complicated because of the many factual, evidentiary, legal, and policy issues which must be considered. A particular penalty must be sufficiently severe to be taken seriously by the violator as well as the remaining regulatory community. However a penalty too severe may not be a good deterrent. It may create an incentive for a violator to undertake further illegal conduct to avoid punishment for the initial violation. In fact, most environmental crimes investigated and prosecuted in Oregon at both the state and federal level involve “cover-up” violations.¹¹³ Overly large penalties may interfere with general deterrence in the regulated community if they create contempt for the compliance program.¹¹⁴ In addition, an excessive penalty may undermine the enforcement program because the public may view it as unfair, creating possible additional administrative, judicial, or political costs for which there may not be counter-balancing benefits in compliance.¹¹⁵

When asked about penalties assessed against other Oregon companies of which they were aware, over 60% of the responding companies thought the assessed penalties were appropriate. Twenty-seven percent of the companies believed the penalty to be too severe and nine percent thought the penalties were too lenient. Similarly, 66% of the surveyed citizens responding thought the penalties assessed were appropriate with only 34% saying that the penalty was not appropriate (either too severe or too lenient).

One might well ask what it means to be “appropriate.” The companies and general public appear to have meant that the penalties assessed were a proper punishment for the kind of legal infraction or environmental insult created. From a regulatory perspective “appropriate” might mean a penalty of a size that creates general deterrence – and it is not clear whether DEQ’s penalties are appropriate by that standard. Some companies reported making compliance decisions based on hearing about penalties assessed against others, but more companies reported making changes based on hearing about inspections and technical assistance done at other companies, and overall companies appeared to be less concerned about penalties than other potential consequences of enforcement. One interpretation of this data is that the dollar values of penalties, at least as assessed in Oregon, are not perceived as severe – indeed, 9% of the companies surveyed thought DEQ’s penalties were too lenient and 28% believe that significant money may be saved through violation because the penalty

¹¹³ Personal observation as a member of Oregon’s multi-agency Environmental Crimes Coordination Team. See also Livernois, John and C.J. McKenna, *Truth or Consequences: Enforcing Pollution Standards with Self-Reporting*, JOURNAL OF PUBLIC ECONOMICS 71(3):415-40 (1999).

¹¹⁴ Volokh, Alexander and Roger Marzulla, *Environmental Enforcement: In Search of Both Effectiveness and Fairness*, Policy Study No. 210, Reason Foundation (August 1996) (alleging that the degree of prosecutorial discretion currently allotted to enforcement agencies leads to arbitrariness).

¹¹⁵ Deily, M. E. and W.B Gray, *Enforcement of Pollution Regulation in a Declining Industry*, JOURNAL OF ENVIRONMENTAL ECONOMICS AND MANAGEMENT 21(2):260-274 (1991).

assessed would be less than the money saved through noncompliance.¹¹⁶ Whether or not this is true, it could contribute to the overall perception that penalties as assessed are too low to be important for the average company.

Companies tended to believe that there is a high likelihood that DEQ would identify violations, but that consequent penalties would be low. This is consistent with a 1988 survey that found small quantity hazardous waste generators significantly overestimate the likelihood of detection.¹¹⁷ Although we can not compare the company accuracy about the risks of detections because we do not know the number of undetected violations, we can compare their perceptions about the size of penalties to penalties actually assessed.

Fifty-four percent of the company respondents were aware that penalties had been assessed against other companies in the past three years (*see* Figure 25). Of those remembering an actual dollar figure, the median penalty recalled was \$24,583.¹¹⁸ This is much higher than \$3,603 which is DEQ’s actual median penalty for the three year period preceding the survey. One likely reason for this overestimate is that respondents were more likely to hear about larger penalties and perhaps more likely to remember larger penalties. However, respondents also had exaggerated recollections for individual cases. For the specific penalized companies recalled by name most often as having been penalized, the *average* penalty recalled was 56 times greater than the *highest* penalty actually assessed against those companies.¹¹⁹ This exaggerated recollection of penalty severity supports DEQ in its efforts to create general deterrence, but is puzzling given the other findings that

¹¹⁶ Of companies that had received prior penalty, 29% said they could violate and save significant money.

¹¹⁷ Hammitt, J.K. & P. Reuter, *Measuring and Detering Illegal Disposal of Hazardous Waste: A Preliminary Assessment*, Santa Monica, CA: RAND, cited in Cohen, Mark A., *Monitoring and Enforcement of Environmental Policy in INTERNATIONAL YEARBOOK OF ENVIRONMENTAL AND RESOURCE ECONOMICS, III* (Tom Tietenberg & Henk Folmer, eds. 1999).

¹¹⁸ Only 28% of the individual members of the public were aware of any penalties for environmental regulations and only 37% of those could recall a penalty amount. The median penalty recalled was \$54,168.

¹¹⁹ Table summarizing the top ten companies recalled as having been previously penalized, number of respondents recalling that company, percent of those recalling a penalty amount, average penalty recalled, and average penalty recalled divided by the highest penalty actually assessed against the company. Average of the last column is 56. Summaries of the actual penalties assessed may be found *infra* at footnotes 64 through 72.

Company Name	Number recalling this name	Percent recalling a penalty	Average penalty recalled	Average penalty recalled ÷ highest actual penalty
Willamette Industries	12	25%	\$3,526,667	54.2
Teledyne Wah Chang	10	20%	\$200,000	4.0
Portland, City of	9	11%	\$100,000	10.4
Weyerhaeuser	7	0%	–	–
Waldport, City of	6	50%	\$36,667	14.7
Taylor Lumber & Treating, Inc	5	20%	\$500,000	357
Roseburg Forest Products	5	60%	\$37,629	3.3
Cain Petroleum, Inc.	4	50%	\$5,700,001	4.0
Spencer Environmental	4	50%	\$8500	0.6
Smith Frozen Foods, Inc	3	0%	–	–

companies tend not to be concerned with penalty amounts. It may be that companies translate their actual concerns about concurrent enforcement effects like forced shut down or criminal prosecution into their recollection of the penalty, but the reasons are not known.

When asked how DEQ should set the size of a penalty, companies place slightly higher value on whether the violator cooperated to correct the violation and whether the violation was accidental, intentional or negligent than on whether the violation caused a risk to public health or caused environmental damage.¹²⁰ This reflects an important cultural belief that companies should try to comply and supports a commonly-held level-playing-field theory that violating companies should pay a penalty that exceeds the avoided or delayed costs of compliance so that competitors who are paying the costs of compliance are not financially advantaged.

In fact, DEQ seeks higher penalties from companies that are not trying to comply. The penalty formula rules increase penalties for negligent, intentional, and flagrant violations and the agency has a practice of referring for criminal investigation and prosecution violations that appear deliberate, deceitful or dishonest. Comparatively few of these very large penalties are assessed and even fewer criminal referrals are made.¹²¹

When asked how DEQ could best ensure compliance with the regulations, over 37% of the companies suggested that DEQ increase the number of inspections and 17% suggested that DEQ increase its enforcement and penalties. It may seem contradictory that companies suggest additional inspections and penalties as a means to ensure compliance when they profess that penalties are not their own top motivating factor. The reason may be that increased risk of detection through inspection, coupled with higher penalties, increases the probability that a non-complying company would feel the impact of the other non-penalty detriments. In the classical theory of general deterrence, “severity” includes all factors that are detriments to the company, not only the monetary penalty. In a typical civil enforcement action, all of the top motivating factors (concern about forced shut-down, concern about the environment, concern about reputation, pressure from the community or customers) have financial detriments which are distinct from the penalty. These detriments come

¹²⁰ When asked what factors DEQ should consider in setting a penalty, over ninety percent of all respondents suggested that DEQ base its penalties on whether (i) the company cooperated in correcting the violation; (ii) the violation was accidental, intentional or due to negligence; (iii) the violation caused a risk to public health; (iv) there was actual environmental damage; (v) the company avoided or delayed compliance; (vi) the company had previous violations; and (vii) the duration of the violation. In fact, these penalty factors are the most important factors on which DEQ currently bases its penalties according to a formula in its rules. Less agreement was seen on other factors. Somewhere between 50% and 90% of the companies thought DEQ should consider whether (i) the law violated was new; (ii) the penalty would economically damage the company; (iii) the company actually knew the law; (iv) the company can pay the penalty; (v) it would take a large amount of DEQ resources to handle the case; and (vi) the company is large or small. These less-agreed-upon factors are not in the current penalty formula rule, but are factors that DEQ may – and does – consider from time to time in exercising equity, prosecutorial discretion and settlement. Seventy-four percent of the companies believed DEQ should not consider whether the media would publicize the penalty – a factor which DEQ does not consider. No company suggested that any other factor be considered.

¹²¹ Garvie, D. & A. Keeler, *Incomplete Enforcement with Endogenous Regulatory Choice*, JOURNAL OF PUBLIC ECONOMICS, 55:141-162 (1994) (proposing a model for agency behavior that predicts low probability high penalties for violations that are especially damaging and the agency can be certain of public support).

about either directly as in a forced shut-down,¹²² or indirectly through impacts on company reputation.¹²³ When the company's illegal and environmentally damaging behaviors are made known through an enforcement action, the company is impacted through pressures from the community and customers. Ironically, DEQ's ability to exact some of these community and customer detriments hangs on penalty size. First, news media outlets are much more interested in, and more likely to publish, a story about a big penalty than a small penalty. Second, public perception about the seriousness and egregiousness of the violation is greatly influenced by the size of the penalty.

Seventy percent of the companies believe they cannot save significant amounts of money by avoiding compliance because the risk of bad press and public exposure is great. Companies are right to be worried about damage to reputation, community pressure and customer pressure from violations. When asked what they would do if they learned that a company they buy from was taking an action that was not good for the environment, 59% of Oregon residents said they would "stop buying from the company," and another 6% said they would reduce buying from the company. And the secondary impacts could compound these problems – 21% say they would tell friends, 24% say they would turn them in to the authorities, and 18% say they would protest the company. These are powerful factors in creating the severity necessary for general deterrence.

Celerity

The speed at which a penalty arrives after a violation occurs creates an important link between the violation and the perception of risk. If the penalty takes a long time to arrive, the violator and others tend to disassociate the violation from the penalty. In addition, interest by outside parties dwindles. The overall effect is that tardy prosecution is not as effective at creating general deterrence. Although this study did not focus on celerity, some idea of DEQ's relative enforcement case speed is important to understanding the whole general deterrence picture of DEQ enforcement. Under EPA's Region 10 timeliness and appropriateness policy which is applicable to all program areas, EPA anticipates that penalties be assessed within three to six months after discovery or confirmation of significant violations.¹²⁴ DEQ's current goal is to issue penalties within 55 days of discovery, which is as fast as or faster than many other environmental agency goals. The actual length of time it takes depends on whether additional information is needed from the company, inspectors or witnesses. It also depends on the speed at which the draft documents cycle through the various review and approval loops. Timeliness also varies by case type – the evidentiary and legal issues are more complicated in some programs than others. During the past six years, DEQ has issued penalties in

¹²² Oregon statutes and rules convey authority to DEQ to revoke permits and licenses and to issue penalties of sufficient size to cause a violator to go out of business, especially in circumstances where the violation was intentional or flagrant or if the violator's financial condition poses a serious concern about its ability or incentive to remain in compliance. While not routine, DEQ has and will take action to shut down facilities in these circumstances.

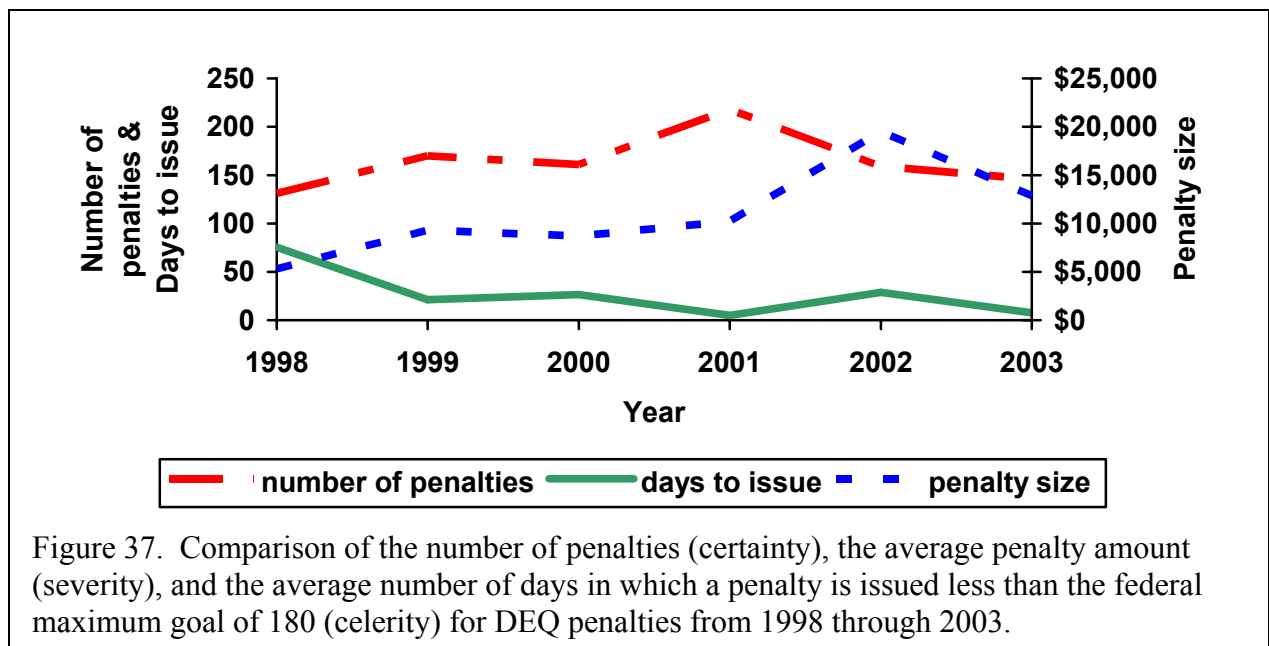
¹²³ DEQ issues press releases to inform the public about the violations it is prosecuting through enforcement. The press releases are typically sent to major and local news outlets and posted on the web at www.deq.state.or.us/news/index.asp. Companies often express more concern about the press release and consequent media attention than about the penalty.

¹²⁴ Enforcement and Compliance Strategy, Region 10 EPA (March 1997), available online at www.epa.gov.

an average of 152 days from the date of detection. While an optimum celerity is not known, DEQ is currently evaluating its case timeliness to determine if there are opportunities for improvement.

Relationship of certainty, severity and celerity

There is an expression, “cheap, fast and good – you can’t have all three,” meaning that these three qualities cannot all be maximized at once. For example, if you want something done cheaply and quickly, it will tend to be poor quality. If you want something high quality, you should expect to either pay more, have it take longer, or both. The same principle applies to the relationship between certainty, severity and celerity, all of which are tied to some extent on the amount of regulatory resource. If DEQ were to assess more or higher penalties, either the certainty or severity would increase respectively. But more penalties or higher penalties tend to create the need for more case preparation, more time in settlements and more appeals. These factors would make it more difficult for DEQ to process the more numerous cases quickly – the celerity therefore tends to decrease. In fact this happened during the late 1990s and early 2000s. During that period, as the average penalty tended to increase, the number of penalties and the celerity showed a distinct inverse relationship in many years. See figure 37. These effects would work in reverse as well. If DEQ were to try to quicken its celerity the only practical way to do it with a given amount of resource would be to lessen the administrative burden of case preparation and prosecution by either issuing fewer or smaller penalties.¹²⁵



¹²⁵ For example, DEQ recently began issuing on-the-spot penalties to violators of underground storage tank rules through a ticketing process. However, in designing those tickets, the penalties had to be lowered to near nominal amounts to encourage payment rather than appeal.

Given that there is a trade-off between the three factors, which is most important? Most research suggests that certainty is more important than severity in modifying behavior.¹²⁶ DEQ's survey hoped to test this hypothesis by asking companies which of the following penalty schemes cause the most concern: one-thousand \$500 penalties; five-hundred \$1,000 penalties; one-hundred \$5,000 penalties; fifty \$10,000 penalties; ten \$50,000 penalties; or one \$500,000 penalty. Each of these options presents an identical monetary risk created by offsets between certainty and severity. The results were surprising in that the answers were not skewed toward one extreme or the other, but were distinctively bimodal as seen in Figure 15. Companies were equally concerned about the most numerous penalties and the most severe penalty with significantly less concern regarding all the combinations in the middle. But that question may have missed the mark because of two fundamental findings about what causes deterrence: (1) that more general deterrence comes from inspections than penalties and (2) the dollar value of penalties is not among the average company's major concerns.

One additional explanation of the Figure 15 data is that the combination of higher certainty and celerity of inspections, coupled with the possibility of reputational damage and other non-penalty consequences, may be of greater concern than the less certain and slower penalty actions having a defined moderate dollar value.¹²⁷ The idea that companies are more concerned with being caught and with the possible non-penalty costs that might occur is also suggested by another piece of indirect evidence. Companies that had been previously penalized were more likely to believe that DEQ would find out about violations, indicating that their perception of certainty had increased. But these same companies tended to believe the penalty was fairer, implying that their perception of the severity had decreased. Yet, the previously penalized companies were much more likely to pay attention to compliance and much more likely to show general deterrence by making changes after hearing about enforcement at other facilities. Some companies may be concerned with penalties of the highest dollar value. But these results show that others, perhaps most, are more concerned by high certainty of being caught in violation, and this latter concern appears to be based on the unknown and potentially severe non-penalty consequences such as forced shut-down or damage to reputation.

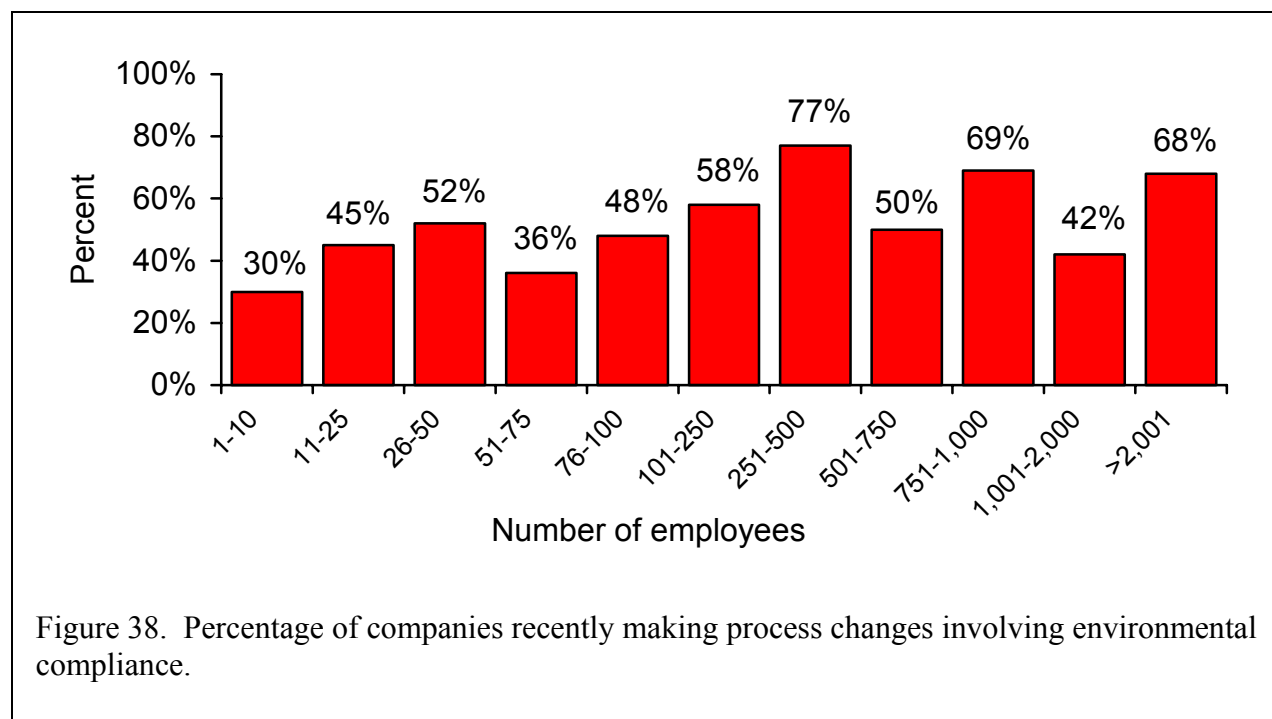
¹²⁶ E.g., INSPECTOR GENERAL, U.S. EPA, FURTHER IMPROVEMENTS NEEDED IN THE ADMINISTRATION OF RCRA CIVIL PENALTIES (1997) available at www.epa.gov/oig/reports/1997/rpentbl.htm (finding that greater penalties did not significantly affect the rate at which a penalized hazardous waste violator returns to compliance); Environment Canada, Administrative Monetary Penalties: Their Potential Use in CEPA, (no. 14 of Reviewing CEPA, the Issues Report Series, 1994) (finding that certainty is more important than severity in modifying behavior). See also, Wilson, James Q., *Thinking About Crime: The Debate over Deterrence*, THE ATLANTIC MONTHLY (Sep. 1983). But see, Alm, J., B. Jackson and M. McKee, *Estimating the determinants of taxpayer compliance with experimental data*, NATIONAL TAX JOURNAL 45:107-114 (1992) (finding that ambiguity of the risk of detection can increase compliance when regulations are not perceived to create a public good) and Friedland, N. *A Note on Tax Evasion as a Function of the Quality of Information about the Magnitude and Credibility of Threatened Fines: Some Preliminary Research*, JOURNAL OF APPLIED SOCIAL PSYCHOLOGY 12:54-59 (1982) (finding that ambiguity of detection increases compliance only when the risk and size of penalty are both small).

¹²⁷ Gray, Wayne B. and John T. Scholz, *Analyzing the Equity and Efficiency of OSHA Enforcement*, LAW AND POLICY 13:185-214 (1991) (finding that the assessment of any penalty may create more deterrence than its size because companies find that managing the effects of any penalty takes resource).

Special Concerns with Small Companies and Individuals

Most of the results and conclusions reported above involve responses provided by the whole population of surveyed companies and so are snapshots of deterrence mechanisms that influence the average company. But that general picture of company behavior definitely does not describe all companies. In particular, the data show that very small companies and individuals likely respond to very different motivational factors than larger-sized companies. For example, Karpoff *et al.* found that, immediately following the announcement of environmental violations, company stock value on the stock exchange fell by an average 1.5% to 2.0%.¹²⁸ Small companies are less likely to be publicly traded and therefore less likely to feel those particular pressures.

Small companies are much less likely to take steps to *assure* compliance (see Figure 9), are significantly less likely to be a member of any group or organization that promotes environmental accountability for businesses, and are less likely to have made recent changes in management, production or operation processes related to environmental issues. (See Figure 38 below.) The data illustrate some reasons for this.



Most companies place responsibility for environmental compliance with supervising managers high in the company hierarchy. This is also true for small companies. In small companies of one to five

¹²⁸ Karpoff, Jonathan, John Lott, Jr., & Graeme Rankine, *Environmental Violations, Legal Penalties, and Reputation costs*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY (1998), reported in Kagan, Robert A., *Environmental Violations and Environmental Crimes: Context and Issues*, presented at “Forum on Deterrence of Environmental Violations and Environmental Crimes,” sponsored by the National Institute of Justice and U.S. Environmental Protection Agency, July 12-13, 1999 (unpublished manuscript).

employees, the president is likely to have the responsibility for environmental compliance compared to large companies of 251 or more employees in which an executive or environmental manager is more likely to have that responsibility. Small companies almost never have a designated environmental manager – 15 times less likely than large companies.

Large companies give environmental responsibilities to executives because environmental compliance tends to be a priority and the large companies tend to work to assure compliance. Furthermore, because there are more employees, they can take advantage of human resource economy of scale to distribute the labor. Small companies do not have this option. The placement of the environmental responsibilities with the owner in small companies may be more a result of failure to delegate or lack of staff to whom delegation would be possible than due to a conscious decision to make compliance a priority. The result is that, in small companies, the same person responsible for hiring, human resources, management, acquisitions, operation, health and safety, production, and product distribution, must also then be expert in environmental regulation. But this may be an essentially impossible task, likely contributing to a finding in another study that three of the top ten problems facing small businesses are: (1) the amount of government regulation, (2) difficulties with the regulations, and (3) federal agencies in general.¹²⁹ The survey showed that companies of 1-5 employees are significantly about half as likely as larger companies to make process changes because of changes in the law. This inability of top management in small companies to keep informed about regulatory changes puts small companies at a significant information disadvantage, allows them to inadvertently violate, and increases their risk of enforcement.

The disadvantage for small companies also shows up clearly in how they interact with DEQ. Compared with a small company of one to five employees, a company with 251 or more employees is likely to engage DEQ in two times as many permit applications, modifications or reviews; is over three times more likely to request technical assistance not related to permit application or inspection; and is almost seven times more likely to attend DEQ advisory committee or rule making hearings.

Small companies are much less aware of the regulatory, enforcement and compliance assistance efforts taken by DEQ. Companies of 1-5 employees are more than four times less likely to have heard about DEQ inspections, penalties, or technical assistance. This creates a significant disadvantage for small companies because they then lack information to understand the regulatory climate they are in and the resources available to help them. Likely, failure to know about technical assistance efforts is a major reason that companies of 1-5 employees are three times less likely to request technical assistance than companies with 251 or more employees – exacerbating the existing relative disadvantage that many larger companies also have in-house environmental managers and expertise. The failure of small companies to know about DEQ enforcement efforts also reduces their ability to learn from the mistakes of others and skews their perception of the risk of penalty toward ignorance that there is any risk. This is clear in the data – companies of only 1-5 employees are significantly more likely than larger companies to strongly believe that significant money can be saved through noncompliance because they are not likely to be caught.¹³⁰

¹²⁹ Franklin, S. & J. Goodwin, *Problems of Small Businesses and Sources of Assistance: A Survey*, JOURNAL OF SMALL BUSINESS MANAGEMENT 21:5-12 (1983).

¹³⁰ However, when asked the likelihood that DEQ would catch “significant” and “less significant” violations, companies of 1-5 employees were not statistically less likely to believe that DEQ would catch the violations. One might ask how

Despite their ignorance of the penalties assessed against other companies and the consequent risks they face, smaller companies are significantly more likely to say financial pressure of fines would have a great deal of impact on their compliance. This indicates that penalties of the size DEQ assesses would be more likely to deter noncompliance of small companies than large – if the small companies knew about them.

The pressures and motivators for small companies appear to differ from medium and large companies. Small companies appear to be less able to insert themselves into the rulemaking and policymaking processes, to take advantage of assistance projects, and to understand the risk of enforcement. It appears that more or higher penalties are not likely to motivate small companies to breach this information gap. A successful regulatory strategy for small companies must either create general deterrence by somehow increasing the *perception* of the enforcement risks or increasing their level of expertise. These results show that DEQ and EPA are correct in establishing educational, technical assistance and other programs designed to address the gap between small and large companies.

Integrating General Deterrence into a Regulatory Program

Deterrence is a necessary component of a regulatory strategy

The data from the surveys show that companies often volitionally adopt environmental changes into their processes and comply because they are concerned about the environment. But not all companies have a strong environmental or stewardship ethic; some companies are proactive only because they fear inspections and enforcement, and some are not proactive at all. A strategy designed to encourage compliance by all regulated parties must consider the multitude of motivations and attitudes.

One theory about the distribution of compliance attitude is that, for any given group, 20% will always comply, 5% will try to evade compliance, and 75% will try to comply as long as the 5% cheaters are caught and punished.¹³¹ If this is true, a perfectly-operating regulatory strategy would create a population of 5% that attempt to evade and 95% that attempt to comply. By this standard, DEQ's regulatory strategy is working very well. While data from the study show that approximately 6% of the companies do not work toward compliance, the remaining 94% report that they either make decisions to assure compliance (65%) or consider environmental issues and work to maintain compliance (29%).¹³² Therefore, it appears DEQ implements its enforcement strategy successfully

the small companies could believe money can be saved through violation when they are equally likely to believe they will be caught. It may be that small companies are more likely to believe that the money saved through violation outweighs the risk of penalty or that they are less concerned with indirect and non-penalty impacts like risk of shut-down or reputational damage.

¹³¹ Chester Bowles, PROMISES TO KEEP (NY: Harper and Row, 1971) as quoted in Kagan, Robert A., *Environmental Violations and Environmental Crimes: Context and Issues*, presented at "Forum on Deterrence of Environmental Violations and Environmental Crimes," sponsored by the National Institute of Justice and U.S. Environmental Protection Agency, July 12-13, 1999 (unpublished manuscript).

¹³² Note that a perfectly operating system may not strive to detect all violations if the marginal cost of detecting the last few percent outweighs the environmental or social benefits of correcting and punishing those violations. See Becker, G.S., *Crime and Punishment: An Economic Approach*, JOURNAL OF POLITICAL ECONOMY 76:169-217 (1968) and other

to create a regulatory environment which gives the middle 75% the incentive and comfort they need to comply.¹³³

Comfort and fairness for those companies that are complying is an essential purpose of enforcement.¹³⁴ DEQ works to create fairness by detecting and penalizing non-compliers.¹³⁵ Through these efforts DEQ hopes to “level the playing field” to ensure that companies who comply are not economically disadvantaged by those who do not. DEQ’s rules increase the dollar value of penalties when the violator knew or should have known better and when the violator does not cooperate in correcting the violation. Companies rated these two factors, which are within the control of the violator, as the most important in assessing a penalty – more important than the resulting risks to public health or the actual environmental damage, which may not be within the control of the violator. The idea that violators should be most liable for factors within their control indicates a strong interest in fairness. In its effort to be fair, DEQ accomplishes its goal. The majority of companies believe that DEQ’s inspection and penalty processes are fair and that the penalties assessed are appropriate. This leads to their willingness to comply.

The study shows that inspections and enforcement motivate compliance through both specific and general deterrence. Companies which have previously received penalties are much more likely to assure their own compliance, and many companies which have never been penalized hear about inspections and enforcement and bring themselves into compliance. This aspect of enforcement is important to the execution of DEQ’s regulatory program because the available resources DEQ has for inspection and assistance are insufficient to contact all regulated facilities on even a sporadic basis.¹³⁶ It is critical that regulated entities keep abreast of new developments in environmental science, technology, and law, and take the voluntary initiative to keep themselves in compliance.

research summarized in Cohen, Mark A., *Monitoring and Enforcement of Environmental Policy in INTERNATIONAL YEARBOOK OF ENVIRONMENTAL AND RESOURCE ECONOMICS*, III (Tom Tietenberg & Henk Folmer, eds. 1999).

¹³³ The population for the survey was drawn from DEQ permit and hazardous waste registration databases. It is reasonable to assume that more than 6% evade compliance because the sample population did not include the unknown number of companies who have not obtained required permits or registrations.

¹³⁴ See, e.g., “EPA firmly believes that alternative compliance strategies will be most effective when they are used as part of an integrated program which maintains a strong compliance monitoring and enforcement presence among regulated entities. For at least three reasons, a vigorous enforcement effort is vital to the success of alternative compliance strategies. [These are motivating compliance, specific and general deterrence, and economic fairness.]” Statement of Eric V. Schaeffer, Director, EPA’s Office of Regulatory Enforcement before the Subcommittee on Oversight and Investigations, Committee on Commerce, U.S. House of Representatives, June 23, 1998.

¹³⁵ OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY, *STRATEGIC DIRECTIONS* (2002), available at www.deq.state.or.us/pubs/strategicdirections/.

¹³⁶ For example, a few years ago, it was estimated that DEQ annually contacted 4,500 facilities in various non-enforcement technical-assistance programs, inspected approximately 3,000 facilities, issued approximately 1,500 Notices of Noncompliance, referred about 300 facilities for formal enforcement, of which about 200 received penalties. Les Carlough, *DEQ Enforcement: In Perspective*, Oregon Insider, Issue #169, Feb. 1, 1997. These numbers obviously pale compared to the more than 150,000 businesses registered with the Secretary of State in Oregon – not to mention the regulatory responsibilities of each individual resident. See also, Oregon Environmental Council; *Holding Polluters Accountable: Strategies for Strengthening Enforcement of Environmental Laws in Oregon*, March 2002 (opining that DEQ has insufficient resources for adequate inspection coverage).

The deterrence of possible inspections and penalties creates the incentive for companies to seek that information. But an efficient and effective regulatory system likely will use more than enforcement as motivation.

An effective regulatory strategy will likely integrate a variety of tools

By integrating a variety of regulatory tools – each consciously chosen for its effectiveness in a particular application – an agency can create a system that both pushes and pulls regulated entities toward environmentally protective behavior. Such a holistic approach can work to decrease direct compliance costs (through information sharing, assistance and incentives), increase direct costs to noncompliance (through penalties and sanctions) and increase the probability that non-complying companies will experience further direct or indirect costs (through customer and community pressure) or additional governmental interventions (through inspections or monitoring). However, determining how and when to use one tool (*e.g.*, inspections) over another tool (*e.g.*, technical assistance) has intellectual challenges.

First, a company's decision to comply or not to comply is likely influenced by more than one factor. For example, a company who adopts a compliance behavior as a result of a technical assistance visit from DEQ may have obtained specific advice during the DEQ visit. However the decision to seek that advice, or to implement it, likely depended on a variety of other factors including environmental stewardship beliefs of the company staff, their propensity to obey laws, and a conscious or unconscious evaluation of the risks if no changes are made. In fact data show that companies which had been previously penalized are significantly more likely to seek technical assistance than those not previously penalized. Therefore, a regulatory strategy based only on technical assistance without enforcement would not reach as many participants and would not be as effective as one that incorporates an enforcement component.

Second, not all companies are affected the same way by the same regulatory pressures. For example, many very small companies are nearly oblivious to general deterrence pressures. Why? The reason is not that they do not value the environment – 54% of the very small companies surveyed professed that they make business decisions to assure compliance with environmental laws and encourage internal efforts to reduce pollution. (*See* Figure 9) The reason is not that they do not fear penalties – data show they fear penalties much more than the large companies. The reason, discussed above, is that they simply do not have time and resources to keep themselves informed about changes in requirements and are oblivious to fact that their competitors' violations are being detected and penalized. Therefore, a regulatory strategy based only on enforcement would not be as effective with small companies as one that includes an outreach and informational component.

DEQ integrates technical assistance and enforcement in several ways. Some integration is incidental. For example, when a DEQ inspector identifies a less significant violation he or she will typically send a Notice of Noncompliance to inform the violator what needs to be done and to set a deadline by which the violation must be corrected. If the company meets the deadline, there is no follow-up enforcement on minor violations and the notice has basically provided compliance assistance. DEQ has also experimented with initiatives that directly integrate the benefits of technical assistance with those of enforcement. For example, in one DEQ effort, the agency announced a short-term general amnesty for small sources of volatile organic compounds (VOCs) in

the Portland airshed, which at the time was categorized non-attainment for the ozone ambient air quality standard. In return for the amnesty, participating companies were required to evaluate their processes for pollution prevention and obtain a permit if needed. Potential participants were notified that once the amnesty program was over, sources found in noncompliance would be referred for penalty. This carrot-and-stick approach attracted 22 participants, resulted in a reduction of 480 tons of VOC emissions per year and contributed significantly to the area's current attainment of the air quality standard.¹³⁷ This is one example of many in which DEQ engaged the regulated public in assistance and outreach initiatives to supplement enforcement.¹³⁸

In a survey conducted by the Association of State and Territorial Solid Waste Management Officials, nearly all states reported that they were using or planning to use a variety of supplemental alternative tools. Some tools were designed to streamline and focus enforcement efforts; some were designed to create compliance incentive programs; and some were designed to disseminate technical information to the regulated public.¹³⁹ Supplemental use of alternative tools by state environmental agencies is supported by both EPA¹⁴⁰ and the United States General Accounting Office (GAO).¹⁴¹ There is also wide agreement that the effectiveness of these alternative compliance efforts must be measured so that their benefits can be quantified and explained. However, identifying how to measure effectiveness in a way that facilitates comparison between efforts has been proven difficult.¹⁴² One promising advance is the "Compliance Rate Template" proposed by the Environmental Compliance

¹³⁷ OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY, VOLATILE ORGANIC COMPOUND (VOC) LIMITED AMNESTY PROJECT REPORT (1996).

¹³⁸ Some initiatives address particular compliance and environmental problems, for example: Air Quality Small Business Assistance Program, Environmental Partnerships for Oregon Communities Project; Pollution Prevention Outreach Program; Toxic-use-reduction and Technical Assistance Program; Voluntary Cleanup Program. Others addresses particular environmental problems in particular locations by reducing or eliminating enforcement for participants that achieve the goals, for example: Columbia Slough Clean-up Project; Eastern Region Hazardous Waste Technical Assistance Outreach Program; Martin Luther King, Jr. Boulevard Revitalization Project; Stormwater Amnesty Project; Volatile Organic Compounds Amnesty Project; and Western Region Hazardous Waste Generator Assistance Project. Details of these initiatives can be found at www.deq.or.us or by contacting the program office numbers provided at that website.

¹³⁹ ASSOCIATION OF STATE AND TERRITORIAL SOLID WASTE MANAGEMENT OFFICIALS, ALTERNATIVE COMPLIANCE METHODS SURVEY (Sep. 1999) (summarizing use of: flexibility in the type of inspection, elimination or reduction of checklists to focus on important issues, streamlined inspections, lower frequency of inspections for historically compliant facilities which agree to conduct routine self assessments, less follow-up for minor violations, expedited enforcement processes, amnesty days and programs, compliance assistance visits without enforcement consequences, workshops, newsletters, compliance schools, compliance tools, fact sheets, and internet web page information).

¹⁴⁰ See ENVIRONMENTAL RESULTS THROUGH SMART ENFORCEMENT: FISCAL YEAR 2002 ENFORCEMENT AND COMPLIANCE ASSURANCE ACCOMPLISHMENTS REPORT, OFFICE OF ENFORCEMENT AND COMPLIANCE ASSURANCE (2003).

¹⁴¹ UNITED STATES GENERAL ACCOUNTING OFFICE, REPORT TO THE COMMITTEE ON COMMERCE, U.S. HOUSE OF REPRESENTATIVES, ENVIRONMENTAL PROTECTION, EPA'S AND STATES' EFFORTS TO FOCUS STATE ENFORCEMENT PROGRAMS ON RESULTS (May 1998).

¹⁴² The GAO found that the key challenges to measurement were "(1) the frequent absence of baseline data needed to determine whether compliance rates or environmental quality have improved under new strategies and (2) the inherently greater difficulty and expense involved in quantifying outcomes (such as industry-wide compliance rates), as compared with counting and reporting output measures [like numbers of inspections and penalties]." *Id.*

Consortium.¹⁴³ The proposed model creates a standardized mathematical protocol to measure compliance rates. The model's flexibility allows comparison of compliance rates between different technical assistance and enforcement initiatives, between programs, and between states. Environmental agencies, like DEQ, that are shifting to results-oriented strategies, in an age of dwindling regulatory dollars for an increasing workload, will find it increasingly important to identify the most effective integration of alternatives for maximum environmental return and maximum fiscal efficiency.

Measuring Deterrence

The National Performance Measures Strategy (NPMS)¹⁴⁴ provides a framework for policy-makers to consider and evaluate the resources needed and the benefits obtained from the variety of regulatory tools. Some parts of deterrence are measurable and included in the NPMS measures. The amount of operational changes and consequent pollution reduction directly deflected from the environment by the requirements of the enforcement action can be measured, is routinely calculated and reported,¹⁴⁵ and constitutes the current enforcement outcome measure of the NPMS. But this study also found that there are aspects of company behavior that are important to a full valuation of enforcement. These include, for example, the operational changes and consequent pollutant reduction resulting from: (1) the tendency of previously-penalized companies to correct current noncompliance (specific deterrence) and (2) the tendency of all companies to bring themselves into compliance after hearing about other DEQ action because of fear of inspection or penalty (general deterrence). These tendencies create a significant hurdle to accurate measurement of deterrence because the positive reinforcement loop between the factors make it difficult or impossible to tease apart which factors caused which.¹⁴⁶

To the extent these factors are measured at all, they likely would be attributed to the technical assistance or incentive program under which the change was made. The likely effect of this is to overvalue technical assistance and undervalue enforcement. By considering only the case-specific pollution reduction created at the target facility, without considering the larger deterrence impacts, the NPMS undermines its two important goals:

- Less accurate prediction about whether the best environmental investment to address a given problem is in more enforcement or more assistance diminishes the value of the NPMS as a resource-management tool.

¹⁴³ Shewmake, Tiffin, *Calculating and Communicating Environmental Compliance Rates*, ECOSTATES, 23-26 (spring 2003), available online at www.complianceconsortium.org/ECCAthored/ComplianceRateArticle.pdf. The model can be downloaded from <http://www.complianceconsortium.org/Projects/ProjectsProducts.asp>.

¹⁴⁴ See infra text accompanying footnote 8.

¹⁴⁵ See, e.g., ENVIRONMENTAL RESULTS THROUGH SMART ENFORCEMENT: FISCAL YEAR 2002 ENFORCEMENT AND COMPLIANCE ASSURANCE ACCOMPLISHMENTS REPORT, OFFICE OF ENFORCEMENT AND COMPLIANCE ASSURANCE (2003).

¹⁴⁶ Cook, Phillip J., *Research in Criminal Deterrence: Laying the Groundwork for the Second Decade*, CRIME AND JUSTICE: AN ANNUAL REVIEW OF RESEARCH, 2:211-268 (1980).

- Positive feedback between the factors confound comparison of the various regulatory tools and reduces the use of the performance measures in creating credible accountability.

Commonly collected enforcement and compliance data are not useful in calculating a complete measure of deterrence. Nonetheless, the survey points out that the general deterrence benefits of inspections and penalties can be great and can account for a large portion of the operational changes and pollution reduction successes normally attributed to other kinds of efforts.¹⁴⁷ State and federal agencies using the NPMS would do well to recognize that inspection and possible penalty appear to be a critical part of most programs regardless of the measured value.

Limitations of Deterrence

The theory of deterrence assumes that people and businesses make conscious and rational decisions based on self interest, and that noncompliance is the result of those decisions. However, various factors can hinder deterrence, and deterrence is irrelevant to some compliance and environmental problems.

Deterrence does not work if people are not paying attention

One problem is that some companies do not perceive the risks associated with enforcement and therefore cannot reach a conscious and rational conclusion. As discussed above, very small companies are particularly uninformed about DEQ's compliance and enforcement efforts. But one should not assume all larger companies are carefully evaluating their risks. Overall, 52% of the companies expressed only moderate or less interest in learning about enforcement at other facilities and 15% expressed extreme disinterest in learning about enforcement at other facilities. This is a considerable hurdle in creating deterrence, because if enforcement information is not thought valuable, then it is not likely to be actively sought or given due weight in compliance decisions. DEQ has long recognized the likely deterrence value of public exposure of violators, and has experimented with several approaches to attracting media attention. However, despite the press releases DEQ issues in some form on every penalty action, relatively few stories are reported in the common media.

Creating a vehicle for getting compliance and enforcement information where it can best support deterrence continues to be a challenge. One hopeful mechanism is the federal effort to present compliance and enforcement information on EPA's Sector Facility Index Project (SFIP), Online Targeting Information System (OTIS), and Enforcement and Compliance History Online (ECHO)

¹⁴⁷ Physicists often add a constant to a formula when the mathematical construction of their theory does not match their particular world view. Newtonian physicists added a normal force to balance forces applied to immovable objects. Einstein decorated his general theory of relativity with a Cosmological Constant to fit his belief in a static universe. Recognizing this distinguished history of innovation, I hereby recommend that EPA add certain "Oregon Constants" to the National Performance Measures Strategy to account for the indirect effects of agency action. Based on the ratios of direct effects which are normally measured and indirect effects which are normally not, these constants may improve the ability of the current model to predict the relative outcomes of the various tools. These constants are: (1) the total value of technical assistance is 149% of the direct effects; (2) the total value of inspections is 243% of the direct effects; and (3) the total value of penalties is 433% of the direct effects. While some might question the admittedly massive assumptions behind these numbers, please note that they are based on more data than Einstein had for the cosmological constant. Statistics never lie.

websites. Many states, including Oregon, are developing similar public enforcement data websites. These sites are designed to make access to enforcement information easier and more attractive to the public, with the idea that consequent pressure or anticipated pressure from the public would stimulate interest and deterrence by the companies.

This kind of effort has been successful before. Under EPCRA's Toxic Release Inventory,¹⁴⁸ companies must report the amounts of toxic chemicals they release, including permitted emissions or discharges. Public release of that information depressed the stock of reporting companies and companies most affected consequently reduced their toxic releases. It is reasonable to assume that making public data about a company's illegal releases and environmental transgressions would also create an environmental return.¹⁴⁹ Great strides have been made in designing, developing and testing websites to publicize environmental compliance information, but, it is not known whether they will achieve their overall goal of raising consciousness and interest. A fact that indicates additional steps may be needed to increase the effectiveness of these efforts in conveying information to their intended recipients is that only 21% of the Oregon's companies and 2% of its residents listed the internet as a desired primary source of information.

Getting the word out to deter current and future important environmental problems will become increasingly difficult with time. Many believe the largest discrete sources of pollution have already been identified and controlled to the extent reasonably possible, and that most important pollution reductions in the future will come from smaller, more-numerous, diffuse, or nonpoint sources. Even if the agencies could identify the actors or behaviors responsible for those pollution sources, the fact that they are diffuse and numerous raises the distinct possibility that the agency would be unable to create an enforcement program in which penalties are perceived as certain, severe and prompt. As discussed above, these factors are needed to create deterrence. New innovative and multi-tool strategies will likely be needed to address these environmental problems.¹⁵⁰

People have to understand how to comply

Deterrence is irrelevant when the company is already taking best efforts. A study conducted by Florida's Department of Environmental Quality found the root cause of some violations to be that some of their regulations were fundamentally unclear.¹⁵¹ This problem is by no means confined to Florida. When asked what would be the single most important step an agency could take to improve compliance, five percent of Oregon companies suggested making the rules clearer and easier to understand.¹⁵² That environmental requirements are unclear is a legitimate complaint. The technical

¹⁴⁸ Emergency Planning and Community Right to Know Act, 42 U.S.C. 11001 *et seq.* (1986), §§ 311 and 312.

¹⁴⁹ Cohen, Mark A., *Monitoring and Enforcement of Environmental Policy* in INTERNATIONAL YEARBOOK OF ENVIRONMENTAL AND RESOURCE ECONOMICS, III (Tom Tietenberg & Henk Folmer, eds. 1999).

¹⁵⁰ OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY, STRATEGIC DIRECTIONS (2002) (Priority no. 4).

¹⁵¹ Florida DEQ Analyzing Root Causes of Violations to Promote Compliance, Environmental Reporter, BNA, 30(1):24 (1999).

¹⁵² While not a valid statistical comparison, this is down from 10% of surveyed companies recommending that the regulations be made easier to understand in a 1994 DEQ survey. Oregon Department of Environmental Quality, *Survey of the Regulated Community*, prepared by Bardsley & Neidhart, Inc. (June 1994) (copy on file with author). Clarifying

and engineering knowledge needed to understand a given compliance issue, combined with the overlapping state and federal statutes, rules, policies and interpretations, can make understanding environmental compliance difficult.¹⁵³ This difficulty is exacerbated if rules are poorly or imprecisely drafted, and could lead to noncompliance regardless of the best efforts of the company and regardless of whether the agency increases enforcement.

Some violations happen despite reasonable care

A similar situation exists when companies are already making good compliance decisions with reasonable risk. Most media programs allow some flexibility in how compliance is achieved and allow the company to determine what is reasonably required and to find a cost-effective means to comply. But very few solutions can guarantee 100% compliance. Most solutions have some small probability of failure, most often due to unforeseeable equipment malfunction or unpredictable environmental variations. Violations resulting from minute risks would be difficult to deter because the company believed it was taking the required steps. In situations where the agency disagrees with the choice of compliance method, other tools like technical assistance, rulemaking and permit modification would likely be more effective than enforcement and general deterrence.

Deterrence may not motivate the very best behaviors

Deterrence is also largely irrelevant to motivating companies to exceed the environmental requirements and adopt environmentally protective behavior above that required by law. Environmental laws set a standard of minimum safety and protection for public health and the environment, but they do not tend to require the highest protection possible. Companies that impose on themselves higher standards of care than required by law do so for many reasons. One of the reasons may be that if they use smaller amounts of chemicals or less toxic chemicals, create more stringent safety protocols, or employ stewardship principles, they are less likely to run afoul of environmental regulations. Deterrence may have a hand in this incentive. But behaviors that go beyond compliance are likely more motivated by a pro-environment philosophy, by employee and customer relations, and by financial advantages of the improvements. It is not reasonable to assume that companies would be compelled to do more than required simply because they heard that other companies failed to meet minimum requirements.

FUTURE DIRECTIONS

The study shows that many companies have a pro-environmental philosophy and take a variety of voluntary steps to ensure compliance with environmental regulations. However, a successful regulatory program must integrate an effective, consistent, and visible enforcement program to deter those companies that do not take the initiative to reach – or choose to avoid – compliance. These

and streamlining the regulations is a DEQ priority. OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY, STRATEGIC DIRECTIONS (2002).

¹⁵³ See Volokh, Alexander and Roger Marzulla, *Environmental Enforcement: In Search of Both Effectiveness and Fairness*, Policy Study No. 210, Reason Foundation 3-5 (August 1996) (discussing how complexity in the regulations leads to uncertainty).

indirect effects of enforcement may create additional incentive for companies to participate in nonenforcement regulatory tools like technical assistance. But there are many aspects of this relationship that are not fully understood. Those interested in further research may wish to consider the following:

- The data suggest that much of the deterrence created comes from inspections rather than the follow-up enforcement itself – though there are overlapping effects. It appears that different populations of companies may be motivated differently. Are there ways to determine how to divvy up a regulatory dollar between inspections and prosecutions in different populations so as to create the best environmental return?
- The public is interested in the compliance status of companies with whom they do business. Companies are very concerned about the public relations impacts of penalties and make a large portion of their own compliance changes after learning about inspections and enforcement at other companies. Ironically, companies are not interested and do not proactively seek information about enforcement at other facilities. We need to find better ways to stimulate interest in enforcement at other companies to create the most general deterrence.
- This study is based on confidential surveys which asked companies about their own beliefs, attitudes and actions. Some readers might be skeptical about the veracity of the self reporting. We recognized this would be an issue and tried to interpret the stated attitudes of the companies in light of the supporting activities they have actually done. Nonetheless, it is not known how well companies do at self-analysis, whether single employees are able to articulate company positions that are actually followed by their companies, whether staff from different hierarchical levels are more or less accurate about the company as a whole, or whether the survey venue itself might influence a company's response. The answers to these questions would be helpful in understanding a true measure of deterrence as divined through a self-reporting survey.
- This study surveyed companies which have a registration or permit with DEQ and which therefore have a higher level of interaction with the agency. It did not survey companies which are not as pervasively regulated or companies which have avoided certificate, registration, license or permit. We do not know how important these later populations are to environmental health, whether they would have the same beliefs and attitudes as those in our databases, or whether they could be motivated in the same ways.
- The survey found that most companies have a pro-environmental ethic and work to ensure compliance. Many agency and non-agency people have expressed surprise and skepticism about this finding, even though they also believe the majority of the significant noncompliance is caused by a minority of "bad apples." Why do so many people distrust that companies want to comply? Is this a prejudice that has been incorporated into our enforcement strategies that may interfere with proper targeting?

- Companies have exaggerated recollections of penalties they heard were assessed. It is possible that companies meld their recollection of the penalty they heard about along with their own fears and concerns about enforcement impact. The source of the exaggerated recollection might yield information on which portions of inspection and enforcement create the best deterrence and environmental return.

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APPENDIX I

General Public Survey

INTRODUCTION

Hello, my name is _____, calling from Market Decisions Corporation, an independent Oregon research firm. We're conducting a brief ENVIRONMENTAL study regarding issues in the state of Oregon and I need to speak to a head of household. Your answers to this study will remain completely confidential.

(IF NECESSARY READ): The primary objective of this survey is to gather honest and unbiased responses from a representative group of state residents. Your household has been selected at random and all of your opinions and responses will remain anonymous and confidential.

=>SCHEDULE CALLBACK IF NECESSARY

SCREENERS

S1 RECORD REGION FROM LIST

- | | | |
|---|--------------|-------------------|
| 1 | Eastern | QUOTA: 100 |
| 2 | Northwestern | QUOTA: 100 |
| 3 | Western | QUOTA: 100 |

S2 Do you have responsibility, or share responsibility, for your household's decisions in environmental areas such as automotive, waste disposal, energy use, etc?

- | | |
|---|--|
| 1 | Yes |
| 2 | No → <i>Get referral to head of household</i> |

S3 (ASK IF RESPONDENT IS A VIOLATOR) What is the zip code where you live?

RECORD ZIPCODE: _____
99998 Refused/Don't know

AWARENESS QUESTIONS

- Q1. If you had a specific question about how some activity might affect Oregon's environment, where would you be MOST LIKELY to turn to get your question answered?
(DO NOT READ LIST – SINGLE MENTION)
- Q2. Where do you usually find out about pollution prevention?
(DO NOT READ LIST – UP TO 5 MENTIONS)
- Q3. How would you prefer to get pollution prevention information?
(DO NOT READ LIST – UP TO 5 MENTIONS)

<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	
11	11	11	Activist Groups (SPECIFY) (Q2/3b: You mentioned activist groups – what groups were you thinking of?)

(SPECIFY):

- | | | | |
|----|----|----|--|
| 12 | 12 | 12 | City government (City of Portland, City of Salem, etc.) |
| 13 | 13 | 13 | County government |
| 14 | 14 | 14 | Department of Environmental Quality (DEQ) |
| 15 | 15 | 15 | Environmental Protection Agency (EPA) |
| 16 | 16 | 16 | Fire department |
| 17 | 17 | 17 | Friend/family member/some individual (word of mouth) |
| 18 | 18 | 18 | Garbage hauler/waste management company |
| 19 | 19 | 19 | Internet (general search/no specific site in mind) |
| 20 | 20 | 20 | Library |
| 21 | 21 | 21 | Local community center/grange hall |
| 22 | 22 | 22 | Metro |
| 23 | 23 | 23 | My place of work (person in my company) |
| 24 | 24 | 24 | Newspaper (daily paper – Oregonian, Statesman Journal, etc.) |
| 25 | 25 | 25 | Newspaper (local community paper) |
| 26 | 26 | 26 | Phone book |
| 27 | 27 | 27 | Radio |
| 28 | 28 | 28 | Schools |
| 29 | 29 | 29 | TV |
| 30 | 30 | 30 | US government |
| 99 | 99 | 99 | Other (SPECIFY): _____ |
| 88 | 88 | 88 | Nowhere/none/nothing |
| 97 | 97 | 97 | Don't know |

- Q4. Are you aware of any programs designed to inform Oregonians about materials or activities that can be harmful to the environment and about how to prevent pollution?

- | | |
|---|------------|
| 1 | Yes |
| 2 | No |
| 7 | Don't know |

Q5. **(IF Q4 = YES)** Who sponsors these programs? **(DO NOT READ LIST – UP TO 5 MENTIONS)**

- 11 Activist Groups
(Q5b: You mentioned activist groups – what groups were you thinking of?)
(SPECIFY):
- 12 City government (City of Portland, City of Salem, etc.)
- 13 County government
- 14 Department of Environmental Quality (DEQ)
- 15 Environmental Protection Agency (EPA)
- 16 Fire department
- 18 Garbage hauler/waste management company
- 20 Library
- 21 Local community center/grange hall
- 22 Metro
- 23 My place of work (person in my company)
- 24 Newspaper (daily paper – Oregonian, Statesman Journal, etc.)
- 25 Newspaper (local community paper)
- 28 Schools
- 30 US government
- 99 Other **(SPECIFY):** _____
- 97 Don't know

Q6. What programs or resources would you like to see available to inform Oregonians about environmental rules, regulations and general pollution prevention?
(PROBE & CLARIFY)

Q7. What would be the best groups to sponsor these programs? **(TOP 3 MENTIONS)**

- 11 Activist Groups
(Q7b: You mentioned activist groups – what groups were you thinking of?)
(SPECIFY):
- 12 City government (City of Portland, City of Salem, etc.)
- 13 County government
- 14 Department of Environmental Quality (DEQ)
- 15 Environmental Protection Agency (EPA)
- 16 Fire department
- 18 Garbage hauler/waste management company
- 20 Library
- 21 Local community center/grange hall
- 22 Metro
- 23 My place of work (person in my company)
- 24 Newspaper (daily paper – Oregonian, Statesman Journal, etc.)
- 25 Newspaper (local community paper)
- 27 Radio
- 28 Schools
- 29 TV
- 30 US government

99 Other (**SPECIFY**): _____
97 Don't know

Q8. If a local office were available in your community where you could ask questions and get information from a pollution prevention expert face-to-face, how often would you expect to use these services? Would you expect to use these services... **(READ LIST)**

- 5 Less than yearly
- 4 Yearly
- 3 Monthly
- 2 Weekly
- 1 Daily
- 7 Don't know
- 8 Never

CURRENT ACTIVITY

Q9. I'm going to read a list of items commonly found around the home and for each, please tell me whether you have disposed of the item in the past two years. Have you disposed of (INSERT A-E) I the past two years? **(READ LIST – DO NOT READ DON'T KNOW)**

<u>Yes</u>	<u>No</u>	<u>DK</u>	
1	2	7	A. Paint, paint thinners or solvent
1	2	7	B. Lawn or garden fertilizers or pesticides
1	2	7	C. Automotive products like oil, antifreeze, transmission or brake fluid
1	2	7	D. Pool or spa chemicals
1	2	7	E. Materials with asbestos

Q10. Which of the following methods have you used to get rid of (INSERT ANY Q9A-E = YES)? Have you disposed of it by...**(READ LIST – UP TO 3 MENTIONS EACH)**

A.	B.	C.	D.	E.	
11	11	11	11	11	Regular trash (curbside pickup)
12	12	12	12	12	The drain inside the house or garage
13	13	13	13	13	The storm sewer on the street
14	14	14	14	14	Pouring it on the ground
15	15	15	15	15	Burying it underground
16	16	16	16	16	Dropping it off at a recycling facility (eg, Metro) or
99	99	99	99	99	Some other way of getting rid of it (SPECIFY)
97	97	97	97	97	(DO NOT READ) Don't know

Q11. If you were disposing of a material you suspect may have a harmful effect on the environment, would you Most Likely...**(READ LIST – SINGLE MENTION)**

- 11 Dispose of it in your regular curbside trash
- 12 Put it in a curbside recycling bin
- 13 Take it to a local disposal or recycling facility, or
- 14 Contact someone to find out if the item required special disposal → **Go to Q13A**
- 99 **(DO NOT READ)** Other (SPECIFY): _____
- 97 **(DO NOT READ)** Don't know

Q12. On a scale of 1 to 7, where '7' means "definitely would" and '1' means "definitely would not," how likely would you be to call someone to find out about the item's disposal?

- 7 Definitely would
- 6
- 5
- 4
- 3
- 2
- 1 Definitely would not
- 8 **(DO NOT READ)** Don't know

Q13A. In the past, some people have disposed of items or materials that they later found to be harmful to the environment. Learning this information may have caused them to change how they handled the item or materials in future disposal. When you've personally found yourself in this situation, were you primarily motivated to change or consider changing how you disposed of the item because of...**(READ LIST – SINGLE MENTION)**

- 1 Concern over the environmental impact;
- 2 Concern over facing a fine if you got caught; or
- 3 Concern over what others might think if they found out
- 7 **(DO NOT READ)** Don't know
- 8 **(DO NOT READ)** Never in this situation

Q13B. If you were disposing of an environmentally harmful material against regulations for some reason, how likely do you think it is that you would be caught and penalized for doing so? Please use a 7-point scale where '7' is "definitely would be caught" and '1' is "definitely would not be caught."

- 7 Definitely would be caught
- 6
- 5
- 4
- 3
- 2
- 1 Definitely would not be caught
- 8 **(DO NOT READ)** Don't know

COMPLIANCE QUESTIONS

Q14. Are you aware of any companies or individuals in your community who have been penalized for not following environmental regulations?

- 1 Yes
- 2 No → **Go to Q23**
- 7 Don't know → **Go to Q23**

Q15. What are the names of the companies and individuals you're aware of that have been penalized? **(IP & INTERVIEWER NOTE: SPECIFY COMPANY OR INDIVIDUAL IN A-D --- SINGLE MENTION--- THEN RECORD NAME)**

- A. 11 Company (RECORD NAME): _____
 12 Individual (RECORD NAME): _____
- B. 11 Company (RECORD NAME): _____
 12 Individual (RECORD NAME): _____
 88 No others
- C. 11 Company (RECORD NAME): _____
 12 Individual (RECORD NAME): _____
 88 No others
- D. 11 Company (RECORD NAME): _____
 12 Individual (RECORD NAME): _____
 88 No others

(IP NOTE: ROTATE Q16 – Q19 TOGETHER, i.e., Q16A, Q17A, Q18A, Q19A, etc.)

Q16 A to D. What kind of violation was (INSERT COMMENTS FROM Q15A-D) penalized for? **(UP TO 3 MENTIONS – READ LIST IF NECESSARY)**

- | | | | | |
|----|----|----|----|----------------------------------|
| A. | B. | C. | D. | |
| 11 | 11 | 11 | 11 | Water pollution |
| 12 | 12 | 12 | 12 | Air pollution |
| 13 | 13 | 13 | 13 | Hazardous waste handling/storage |
| 99 | 99 | 99 | 99 | Other (SPECIFY) |
| 97 | 97 | 97 | 97 | Don't know/remember |

Q17 A1 to D1. What penalty was assessed against (INSERT COMPANY OR INDIVIDUAL FROM Q15A-D)? **(DO NOT READ)**

11 Dollar fine (SPECIFY) --> (Q17A-Q17d) \$ _____ .00
 dollars

- 9999996 More than \$10 million
- 9999997 Don't Know
- 9999998 Refused

(IP NOTE: ALLOW DOLLARS UP TO \$X,XXX,XXX – DISALLOW 96, 97, 98, 996, 997, 998, 9996, 9997, 9998, 99996, 99997, 99998, 999996, 999997, 999998.)

- 12 Warning
- 13 Jail sentence
- 14 Company was shut down
- 99 Other (SPECIFY) _____
- 97 Don't know

98 Refused

Q18A to D. At the time that you learned of this penalty, did you know that the action (INSERT COMMENTS FROM Q15A-D) took violated an environmental regulation enforceable with some kind of penalty or fine?

- 1 Yes
- 2 No
- 7 Don't know/can't remember

Q19A to D. Do you believe that the penalty they received was appropriate for the violation?

- 1 Yes
- 2 No
- 7 Don't know/can't remember

Q20. How did you learn that these companies or individuals received a penalty?
(UP TO 5 MENTIONS)

- 11 Activist Groups
(Q20b: You mentioned activist groups – what groups were you thinking of?)

(SPECIFY)

- 12 City government (City of Portland, City of Salem, etc.)
- 13 County government
- 14 Department of Environmental Quality (DEQ)
- 15 Environmental Protection Agency (EPA)
- 16 Fire department
- 17 Friend/family member/some individual (word of mouth)
- 18 Garbage hauler/waste management company
- 19 Internet
- 20 Library
- 21 Local community center/grange hall
- 22 Metro
- 23 My place of work (person in my company)
- 24 Newspaper (daily paper – Oregonian, Statesman Journal, etc.)
- 25 Newspaper (local community paper)
- 26 Phone book
- 27 Radio
- 28 Schools
- 29 TV
- 30 US government
- 31 Direct mail/flyer to my home
- 99 Other **(SPECIFY):** _____
- 97 Don't know

Q21. Using a 7-point scale where '7' means "drastically changed" and '1' means "no change", how has learning of this penalty (these penalties) changed how you handle materials you know to be environmentally harmful?

- 7 Drastically changed
- 6
- 5
- 4
- 3
- 2
- 1 No change
- 8 **(DO NOT READ)** Don't know

Q22. Why did learning of this penalty (these penalties) have this impact on your behavior?

Q23. If you learned today that a company you regularly buy from was taking an action that was not good for the environment, what, if anything, do you think you would be likely to do?
(DO NOT READ LIST – UP TO 5 MENTIONS)

- 11 Tell your friends
- 12 Stop purchasing from the company
- 13 Reduce your purchasing from the company
- 14 Write a protest letter to the company
- 15 Inform an activist group
- 16 Start a protest action against the company (demonstrations, flyers, etc)
- 17 Participate in a protest action against the company
- 99 Other **(SPECIFY)** _____
- 97 Don't know
- 88 Nothing

Q24. If you learned today that a company you regularly buy from was being fined as a result of violating an environmental regulation, how likely would you be to reduce your patronage of this company? Please use a 7-point scale where '7' is "definitely would" and '1' is "definitely would not" change your use of the company.

- 7 Definitely would change
- 6
- 5
- 4
- 3
- 2
- 1 Definitely would not change
- 8 **(DO NOT READ)** Don't know

Q25. If you discovered a company was illegally disposing of environmentally hazardous material, how likely would you be to report this violation to the authorities? Please use a 7-point scale where '7' is "definitely would" and '1' is "definitely would not" report the violation.

- 7 Definitely would report
- 6
- 5
- 4
- 3
- 2
- 1 Definitely would not report
- 8 **(DO NOT READ)** Don't know

Q26. If you discovered the company you work for was illegally disposing of environmentally hazardous material, how likely would you be to report this violation to the authorities? Again, use a 7-point scale where '7' is "definitely would" and '1' is "definitely would not" report the violation.

- 7 Definitely would report
- 6
- 5
- 4
- 3
- 2
- 1 Definitely would not report
- 8 **(DO NOT READ)** Don't know

Q27. How likely do you think Oregon companies are to change their own practices once they hear about penalties given to other, similar companies? Please use a 7-point scale where '7' means hearing about a penalty "definitely would" and '1' means hearing about it "definitely would not" change other companies' behavior.

- 7 Definitely would change
- 6
- 5
- 4
- 3
- 2
- 1 Definitely would not change
- 8 **(DO NOT READ)** Don't know

Q28. How likely do you think Oregon **individuals** are to change their own practices once they hear about penalties given to other individuals? Please use a 7-point scale where '7' means hearing about a penalty "definitely would" and '1' means hearing about it "definitely would not" change other individuals' behavior.

- 7 Definitely would change
- 6
- 5
- 4
- 3
- 2
- 1 Definitely would not change
- 8 **(DO NOT READ)** Don't know

Q29. Do you think that a company's size or type of business should be a factor in assessing the size of a civil penalty?

- 1 Yes
- 2 No
- 7 Don't know

Q30. Do you think that individuals and companies who violate environmental regulations should be treated the same in assessment of civil penalty?

- 1 Yes
- 2 No
- 7 Don't know

DEMOGRAPHICS

(READ) Now, I just have a couple of questions to help classify your answers...

D1. Would you consider the area you live in to be....**(READ LIST)**

- 1 Urban,
- 2 Suburban, or
- 3 Rural?
- 8 **(DO NOT READ)** Refused

D2. Do you belong to any environmental groups?

- 1 Yes
- 2 No
- 8 Refused

D3. What is your age? **(READ LIST IF NECESSARY)**

- 1 18 to 24
- 2 25 to 34
- 3 35 to 44
- 4 45 to 54
- 5 55 to 64
- 6 or, 65 or older
- 8 **(DO NOT READ)** Refused

D4. What is the last level of education that you have had the opportunity to complete?
(READ LIST IF NECESSARY)

- 1 Less than high school
- 2 Completed high school
- 3 Some college/associates/vocational school
- 4 Completed 4-year college (BA or BS)
- 5 Some graduate school
- 6 Completed graduate degree
- 8 **(DO NOT READ)** Refused

D5. Which of the following categories contains your household's total annual income?
(READ LIST)

- 1 Less than \$20,000
- 2 \$20,000 to less than \$40,000
- 3 \$40,000 to less than \$60,000
- 4 \$60,000 to less than \$80,000
- 5 \$80,000 to less than \$100,000
- 6 \$100,000 to less than \$120,000
- 7 \$120,000 or more
- 8 **(DO NOT READ)** Refused

D6. **RECORD GENDER**

- 1 Male
- 2 Female

D7. **RECORD FIRST NAME**

D8. **RECORD/VERIFY PHONE NUMBER**

Thank you very much for your time and

APPENDIX II

Company Survey

RESPONDENT SEARCH

Hello, my name is _____, calling from Market Decisions Corporation, an independent Oregon research firm. We're calling Oregon businesses regarding the Oregon Department of Environmental Quality to conduct a brief **CONFIDENTIAL study** and I need to speak to your operations officer or environmental manager. (INTERVIEWER NOTE: Who would that be? RECORD NAME BEFORE BEING TRANSFERRED)

RECORD CONTACT NAME & JOB TITLE:

(IF NO OPERATIONS OFFICER/ENVIRONMENTAL MANAGER OR SMALLER FIRM: Who would be the person who would make decisions about changes to your company's environmental policies and procedures?)

(AS NECESSARY READ): Our study objective is to gather honest and unbiased responses from a representative group of state businesses. Your company has been selected at random and all of your opinions and responses will remain ANONYMOUS and CONFIDENTIAL. This means that Market Decisions as an independent 3rd party company WILL NOT reveal any identifying information about your company to DEQ or to anyone else. Responses from you or your company will not be associated with any of your identifying information).

INTRODUCTION

Hello, my name is _____, calling from Market Decisions Corporation, an independent Oregon research firm. We're calling Oregon businesses regarding the Oregon Department of Environmental Quality to conduct a brief **CONFIDENTIAL study**.

As an independent 3rd party company, Market Decisions WILL NOT reveal any identifying information about your company to DEQ or to anyone else. Your responses will be combined with feedback from hundreds of other Oregon businesses for analysis and will not be associated with any identifying company or personal information.

(AS NECESSARY READ): Our study objective is to gather honest and unbiased responses from a representative group of state businesses. Your company has been selected at random and all of your opinions and responses will remain ANONYMOUS and CONFIDENTIAL. This means that Market Decisions as an independent 3rd party company

WILL NOT reveal any identifying information about your company to DEQ or to anyone else. Responses from you or your company will not be associated with any of your identifying information).

SCREENERS

S1 Do you have responsibility, or share in the responsibility, of making business decisions regarding environmental rules and regulations for your facility?

1 Yes

2 No → **Get referral to decision maker when it comes to the impact of environmental regulations on business**

LIST QUESTIONS

S2 (AUTOMATED) RECORD LIST SOURCE

			<u>Large</u>	<u>Small</u>
1	DEQ Water	Quota =	NPDES Major	WPCF
2	DEQ Air	Quota =	TITLE V	ACDP
3	DEQ Hazardous Materials	Quota =	LQG	SQG

S3 (AUTOMATED: IF S2=1, 2, or 3) RECORD INFRACTION STATUS FROM LIST

1 Violator

2 Non-violator

S4 (AUTOMATED) RECORD SIC CODE FROM LIST

RECORD SIC CODE: _____

S5 How many employees does your company have at all locations?

(Qx: WE MAY NEED TO SET SOME TYPE OF QUOTA ON EMPLOYEE SIZE -)

RECORD: _____

99996 More than 99995 (specify)

99998 Refused → **Get referral or thank and terminate**

99997 Don't know → **Get referral or thank and terminate**

S6 What is your job title?

(Qx: MAY NEED TO ALLOW OR DISSALLOW INTERVIEWS WITH DIFFERENT JOB TITLES DEPENDENT UPON THE SIZE OF THEIR COMPANY)

- 11 Executive Officer/CEO
- 12 Environmental Manager
- 13 President
- 14 Owner/sole proprietor
- 15 Operations Officer/COO
- 16 Health and Safety Officer (OSHA, DEQ, etc)
- 99 Other → **specify**

S7 What county is your facility located in?

CODE	COUNTY	REGION ASSIGNMENT	CODE	COUNTY	REGION ASSIGNMENT
51	Baker	1	44	Lincoln	3
21	Benton	3	23	Linn	3
11	Clackamas	2	60	Malheur	1
41	Clatsop	2	24	Marion	3
42	Columbia	2	61	Morrow	1
43	Coos	3	12	Multnomah	2
52	Crook	1	25	Polk	3
31	Curry	3	62	Sherman	1
53	Deschutes	1	45	Tillamook	2
32	Douglas	3	63	Umatilla	1
54	Gilliam	1	64	Union	1
55	Grant	1	65	Wallowa	1
56	Harney	1	66	Wasco	1
57	Hood River	1	13	Washington	2
33	Jackson	3	67	Wheeler	1
58	Jefferson	1	26	Yamhill	3
34	Josephine	3	98	Refused → Get referral or thank and terminate	
35	Klamath	1	97	Don't know → Get referral or thank and terminate	
59	Lake	1			
22	Lane	3			

S8 (AUTOMATED) RECORD REGION FROM S7.

- 1 Eastern
- 2 Northwestern
- 3 Western

S9 What is the primary business in which your company is engaged? **(RECORD CLOSEST MATCH)**

- | | | | |
|----|--|----|-----------------------------------|
| 11 | Agriculture, Forestry, Fishing (SIC 01-09) | 22 | Transportation (SIC 40-42, 44-47) |
| 12 | Construction (SIC 15-17) | 23 | Utilities (SIC 49) |
| 13 | Education | 24 | Wholesale (SIC 50-51) |
| 14 | Engineering, Architecture, Mgt. Consult. (SIC 87 - Except 872) | 99 | Other → Specify _____ |
| 15 | Government | | |
| 16 | Health Care (SIC 80) | | |
| 17 | Hospitality (SIC 70) | | |
| 18 | Manufacturing/Production (SIC 20-26, 28-39) | | |
| 19 | Mining (SIC 10-14) | | |
| 20 | Printing and Publishing (SIC 27) | | |
| 21 | Retail (SIC 52-59) | | |

BACKGROUND (COMPANY STRUCTURE)

Q1. Which positions or job titles in your company have primary responsibility for decisions regarding environmental law compliance? **(DO NOT READ LIST – UP TO 5 MENTIONS)**

- 11 President / Owner
- 12 Vice President
- 13 Environmental Manager
- 14 Health and Safety Officer
- 15 General Manager
- 16 Other Manager (with day-to-day production responsibilities)
- 18 Production staff
- 99 Other **(SPECIFY):** _____
- 97 Don't know

Q2. Generally speaking, which ONE of the following statements would you say BEST describes how your company typically deals with environmental matters? Would you say... **(READ LIST – SINGLE MENTION)**

- 1 Your company avoids dealing with environmental matters, occasionally receiving notices of noncompliance or noncompliance fines;
- 2 Your company deals with environmental matters as problems arise or are given notice of noncompliance;
- 3 Your company considers environmental law compliance when making business decisions and works to maintain compliance; or
- 4 Your company makes business decisions to assure compliance with environmental laws and encourages internal efforts to reduce pollution.
- 7 Don't know

Q3. Has your company recently made any management, production or operation changes that incorporated environmental issues, or were as a result of, environmental issues?

- 1 Yes
- 2 No → **SKIP TO Q6**
- 7 Don't know → **SKIP TO Q6**

Q4. What issues led your firm to make production and operation changes that relate to the environment?
(DO NOT READ - MULTIPLE MENTION)

- 11 Community interest
- 12 Company policy/directive from upper management
- 13 Customer demand
- 14 Costs of input materials or disposal costs
- 15 DEQ enforcement against your company
- 16 DEQ enforcement against other companies
- 17 Government awards or other incentives
- 18 State toxics use reduction planning requirements

- 19 Just became aware of existing compliance law
- 20 Change was made to compliance law
- 99 Other (specify) _____

Q5. Exactly what management production and/or operation changes has your company made that incorporated environmental issues or was as a result of environmental issues?

Q6. When your company develops new management, operational or production process, which ONE of the following statements BEST describes the point at which environmental compliance concerns are considered? **(READ LIST – SINGLE MENTION)**

- 1 During the initial concept design
- 2 During the development
- 3 After implementation
- 4 When (or if) a notice of noncompliance is given
- 5 After a fine was assessed
- 8 (DO NOT READ) No production process/not applicable

CURRENT ACTIVITY

(INTERVIEWER NOTE: As necessary, read: Again, I want to stress that your responses to this research are completely anonymous and confidential.)

Q7. If for some reason your company found itself in noncompliance with environmental laws, please tell me how influential the following items would be in motivating your company to get back into compliance. Please rate the degree of influence each item would have using a scale from 1 to 7 where '7' means a "tremendous influence" and '1' means "no influence." How much influence would (INSERT ITEM) have on motivating your company to get back into compliance? **(ROTATE LIST)**

- A Pressure or concern from the community
- B Pressure or concern from customers
- C Pressure or concern from employees

- D Pressure or concern from company insurers
- E Company concern about the environment
- F Company concern about corporate reputation

- G Financial pressure of potential fines
- H Financial pressure of actual fines
- I Concern over criminal prosecution
- J Concern over a forced shut-down
- K Possible withholding of future state or federal contracts

- 7 Tremendous influence
- 6

5
4
3
2
1
9

No influence
(DO NOT READ) Don't know

Q8. (REMOVED)

Q9. If there were an environmental penalty assessed against your facility/company, please rate the likelihood of upper management getting involved to do the following things. Would upper management be very likely, somewhat likely, not too likely, or not at all likely to get involved to... **(ROTATE)**

- A Direct an effort to attain compliance
- B Allocate resources to fix the problems
- C Address public perception
- D Discipline staff
- E Educate staff

- 4 Very likely
- 3 Somewhat likely
- 2 Not too likely
- 1 Not at all likely
- 7 Don't know

Q10. When it comes to making production and operation changes in order to maintain compliance with environmental laws, are employees at your company generally required to...? **(MARK BEST FIT)**

- 1 Obtain the approval of upper management prior to addressing these issues
- 2 Make necessary changes, then seek approval of upper management to maintain changes
- 3 Make the necessary changes (decision are made by individual other than upper management)

PERCEPTIONS OF DEQ & ENFORCEMENT

(INTERVIEWER NOTE: As necessary, read: Again, I want to stress that your responses to this research are completely anonymous and confidential.)

Q11. Based on what you have heard, do you think DEQ's penalty assessment process is...?

(READ LIST)

- 4 Very fair
- 3 Somewhat fair
- 2 Not too fair
- 1 Not at all fair
- 7 (DO NOT READ) Don't know/have not heard
- 8 (DO NOT READ) Refused

Q11B. Based on what you have heard, do you think DEQ's inspection process is...?
(READ LIST)

- 4 Very fair
- 3 Somewhat fair
- 2 Not too fair

- 1 Not at all fair
- 7 (DO NOT READ) Don't know/have not heard
- 8 (DO NOT READ) Refused

Q12. If your company experienced a significant environmental violation for some reason, how likely do you think it is that DEQ would find out about it? Please use a 7-point scale where '7' is "DEQ definitely would find out" and '1' is "definitely would not find out."

- 7 Definitely would find out
- 6
- 5
- 4
- 3
- 2
- 1 Definitely would not find out
- 9 **(DO NOT READ)** Don't know

Q13. If your company experienced a less significant environmental violation for some reason, how likely do you think it is that DEQ would find out about it? Please use a 7-point scale where '7' is "DEQ definitely would find out" and '1' is "definitely would not find out."

- 7 Definitely would find out
- 6
- 5
- 4
- 3
- 2
- 1 Definitely would not find out
- 9 **(DO NOT READ)** Don't know

Q14. If you learned in the following year DEQ planned to assess one of the following types of civil penalties, which ONE of these would raise the most concern for your company? (READ) (SINGLE MENTION)

- 11 DEQ issuing \$500 civil penalties to 1,000 companies
- 12 DEQ issuing \$1,000 civil penalties to 500 companies
- 13 DEQ issuing \$5,000 civil penalties to 100 companies
- 14 DEQ issuing \$10,000 civil penalties to 50 companies
- 15 DEQ issuing \$50,000 civil penalties to 10 companies
- 16 DEQ issuing a \$500,000 civil penalty to one company

Q15. Now thinking about specific factors used to assess penalties for environmental violations, which of the following do you think DEQ should consider when they assess penalties or increase the size of penalties assessed against Oregon companies? **(ROTATE LIST A-L, THEN ASK M)**

- A Whether the law violated is new
 - B The size of the company
 - C The extent to which the company actually knows the environmental regulations
 - D The amount of DEQ resources it would take to handle the case
 - E Whether the penalty would economically damage the company
 - F Whether the company has had previous violations
 - G Whether the violation caused a risk to public health and the environment
 - F Actual amount of environmental damage
 - H Whether the violation was accidental, intentional, or due to negligence on the part of the company
 - I The duration of the violation
 - J Whether the company cooperated with DEQ in correcting the violation
 - K Whether the company avoided or delayed compliance
 - L Whether the media will publicize the penalty
 - M Whether the company has the ability to pay the penalty
- 1 Yes, DEQ should consider
 - 2 No, DEQ should not consider
 - 7 Don't know

Q15N. Are there any other factors DEQ should consider?

- 99 Yes (specify)_____
- 88 No other factors

COMPLIANCE QUESTIONS

(INTERVIEWER NOTE: As necessary, read: Again, I want to stress that your responses to this research are completely anonymous and confidential.)

Q16. During the past 3 years, how many times have you personally...**(READ LIST)**
RECORD

NUMBER

- A. Read or heard about DEQ inspections? _____
- B. Read or heard about DEQ technical assistance efforts? _____
- C. Read or heard about DEQ penalties against other firms? _____

9997=Don't Know

Q17. During the past 3 years, how many times has your company made a change to its production, manufacturing or operating practices as a result of learning about...**(READ LIST)**

RECORD

NUMBER

- A. DEQ inspections? _____
- B. DEQ technical assistance efforts? _____
- C. DEQ penalties against other firms? _____

9997=Don't Know

Q18. During the past 3 years, how many times have you personally or has someone within your company...**(READ LIST)**

RECORD

NUMBER

- A. Attended DEQ advisory committees or rulemaking hearings? _____
- B. Made DEQ permit applications, modifications, or reviews? _____
- C. Requested technical assistance from DEQ not related to permit application or inspection? _____

9997=Don't Know

Q19. During the past 3 years, how many times has your company ...

RECORD

NUMBER

- F. Been inspected by DEQ? _____
- G. Received a notice of noncompliance? _____
- H. Been assessed penalties due to cited noncompliance? _____

9997=Don't Know

Q20. How often, if ever, does your company perform comprehensive internal inspections for environmental compliance each year?

RECORD _____

- 000 Less than once per year
- 888 Never

Q21. Now I'd like you to think about the economic aspects of environmental compliance. I'm going to read you some statements, and for each one I'd like you to tell me whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

The first statement is... **(ROTATE LIST)**

- A Companies can save significant money by avoiding compliance with environmental regulations because they are not likely to get caught
- B Companies can save significant money by avoiding compliance with environmental regulations because if they do get caught, the penalty

assessed is likely to be less than the amount they saved through noncompliance

- C Companies can save significant money by avoiding compliance but there is a moderate risk of getting caught
- D Companies cannot save significant money by avoiding compliance because there is a good chance of receiving a penalty
- E Companies cannot save significant money by avoiding compliance because the risk of bad press and public exposure is great

- 4 Strongly agree
- 3 Somewhat agree
- 2 Somewhat disagree
- 1 Strongly disagree
- 7 **(DO NOT READ)** Don't know

Q22. Has your company ever been penalized for not following environmental regulations?

- 1 Yes
- 2 No → **Go to Q25**
- 7 Don't know → **Go to Q25**

Q23. Did the penalty cause your company to correct the noncompliance violation(s)?

- 1 Yes
- 2 No → **Go to Q25**
- 7 Don't know → **Go to Q25**

Q24. How much impact did the actual penalty (or fine) have on your company's business decision to correct the noncompliance violation(s)? Please rate the impact on a scale of 1 to 7 where '7' means the penalty had a "tremendous impact" on our business decision and '1' means the penalty had "zero impact" on our business decision.

- 7 Tremendous impact
- 6
- 5
- 4
- 3
- 2
- 1 Zero impact
- 9 **(DO NOT READ)** Don't know

Q25. Are you aware of any **other** companies in your industry or community who have been penalized in Oregon by DEQ for not following environmental regulations?

- 1 Yes
- 2 No → **Go to Q32**
- 7 Don't know → **Go to Q32**

Q26. What are the names of the companies you're aware of that have been penalized? **(IP & INTERVIEWER NOTE: SPECIFY COMPANY IN A-C --- SINGLE MENTION--- THEN RECORD NAME – TOP 3 MENTIONS)**

- A. 99 Company (RECORD NAME): _____
- B. 99 Company (RECORD NAME): _____
- 88 No others
- C. 99 Company (RECORD NAME): _____
- 88 No others

(IP NOTE: ROTATE Q27 – Q30 TOGETHER, i.e., Q27A, Q28A, Q29A, Q30A)

Q27A to C. Is this company in your same industry, a similar industry or a completely different industry from your company?

- 1 Same industry
- 2 Similar industry
- 3 Completely different industry

Q28 A to C. What penalty was assessed against (INSERT COMPANY FROM Q26A-C)?

(DO NOT READ)

- 11 Dollar fine (SPECIFY) → (Q28A1-Q28C1) \$ _____
- .00 dollars
- 9999996 \$10 million+ (Q28A2-D2: SPECIFY AMOUNT)

- 9999997 Don't Know
- 9999998 Refused
- 12 Warning / Notice of Non-compliance (NON)
- 13 Jail sentence
- 14 Company was shut down
- 99 Other (SPECIFY) _____
- 97 Don't know
- 98 Refused

Q29A to C. At the time that you learned of this penalty, did you know that the action (INSERT COMPANY FROM Q26A-C) took violated an environmental regulation enforceable with some kind of penalty or fine?

- 1 Yes
- 2 No
- 7 Don't know
- 8 Can't remember

Q30A to C. Do you believe that the penalty they received for the violation was...(READ LIST)?

- 1 Too high / severe
- 2 Appropriate
- 3 Too low / lenient
- 7 (DO NOT READ) Don't know/can't remember

Q31. What management, production and/or operation changes has your company made as a result of learning about other companies being penalized for environmental non-compliance?

Q32. How do you typically learn about companies receiving a penalty(s)?
(UP TO 5 MENTIONS)

- 11 Industry newsletter
- 12 Newspaper (daily paper – Oregonian, Statesman Journal, etc.)
- 13 Newspaper (local community paper)
- 14 Department of Environmental Quality (DEQ)
- 15 Environmental Protection Agency (EPA)
- 16 Friends/colleagues in the industry/company
- 17 City government (City of Portland, City of Salem, etc.)
- 18 County government
- 19 Internet
- 21 Radio
- 22 TV
- 99 Other (SPECIFY): _____
- 97 Don't know

Q33. Using a 7-point scale where '7' means "extremely interested" and '1' means "not at all interested", how interested would you be in finding out when other companies violate environmental regulations?

- 7 Extremely interested
- 6
- 5
- 4
- 3
- 2
- 1 Not at all interested
- 9 **(DO NOT READ)** Don't know

Q34. If you were in charge of the regulatory agency governing environmental regulations, what do you believe would be the best way to ensure compliance with these environmental regulations?

Q35. If DEQ offered the following methods of Technical Assistance, which ONE would best serve your organization's needs? (READ LIST & ROTATE) (SINGLE MENTION)

- 11 Phone contact
- 12 Site visit
- 13 Written documents such as brochures, fact sheets, handbooks, etc.
- 14 Web based information
- 15 Workshop or seminar
- 99 Others (please specify): _____
- 97 Don't know

Q36. Where do you typically obtain most of your information on compliance with environmental regulations? (DO NOT READ LIST) (MULTIPLE MENTION)

- 11 DEQ
- 12 Other state or federal agency
- 13 Trade or industry associations
- 14 Vendors or suppliers
- 15 Consultants
- 99 Other (Specify): _____
- 97 Don't know

DEMOGRAPHICS

(READ) Now, I just have a couple of questions to help classify your answers in relation to other Oregon businesses...

D1. Is your company located in an urban, suburban, or rural area....**(READ LIST)**

- 1 Urban,
- 2 Suburban, or
- 3 Rural?
- 7 **(DO NOT READ)** Don't Know
- 8 **(DO NOT READ)** Refused

D2. Is your company a member of any groups or organizations that promote environmental accountability for businesses?

- 1 Yes (*specify*)
- 2 No
- 7 **(DO NOT READ)** Don't Know
- 8 **(DO NOT READ)** Refused

D3. How long has your company been in business in Oregon?

- RECORD YEARS: _____
- 00 Less than one year
 - 97 **(DO NOT READ)** Don't Know
 - 98 **(DO NOT READ)** Refused

D4. Are the corporate offices of your company located in Oregon?

- 1 Yes
- 2 No

D5. What is your company's total annual revenue?

RECORD \$: _____
00000000 Less than one year
99999996 More than \$10 million (*specify*)
99999997 **(DO NOT READ)** Don't Know
99999998 **(DO NOT READ)** Refused

D6. **RECORD GENDER**

1 Male
2 Female

D7. **RECORD FIRST NAME**

D8. **RECORD/VERIFY PHONE NUMBER**

D9. **RECORD/VERIFY COMPANY NAME**
Thank you very much for your time and opinions!