



THE MASSACHUSETTS
TOXICS USE REDUCTION INSTITUTE

SURVEY EVALUATION OF THE MASSACHUSETTS TOXICS USE REDUCTION PROGRAM

Methods and Policy Report No. 14

1997

University of Massachusetts Lowell

February 1997

SURVEY EVALUATION OF THE MASSACHUSETTS TOXICS USE REDUCTION PROGRAM

Prepared by:

**Abt Associates Inc.
55 Wheeler Street
Cambridge, Massachusetts 02138**

Cheryl Keenan
Joshua L. Kanner
Diane Stoner

Prepared for:

**The Massachusetts Toxics Use Reduction Institute
University of Massachusetts Lowell**

Contract S963441

Monica M. Becker
Project Manager

All rights to this report belong to the Toxics Use Reduction Institute. The material may be duplicated with permission by contacting the Institute.

The Toxics Use Reduction Institute is a multi-disciplinary research, education, and policy center established by the Massachusetts Toxics Use Reduction Act of 1989. The Institute sponsors and conducts research, organizes education and training programs, and provides technical support to promote the reduction in the use of toxic chemicals or the generation of toxic chemical byproducts in industry and commerce. Further information can be obtained by writing the Toxics Use Reduction Institute, University of Massachusetts Lowell, One University Avenue, Lowell, Massachusetts 01854.

©Toxics Use Reduction Institute, University of Massachusetts Lowell

February 1997

SURVEY EVALUATION OF THE MASSACHUSETTS TOXICS USE REDUCTION PROGRAM

Prepared by:

**Abt Associates Inc.
55 Wheeler Street
Cambridge, Massachusetts 02138**

Cheryl Keenan
Joshua L. Kanner
Diane Stoner

Prepared for:

**The Massachusetts Toxics Use Reduction Institute
University of Massachusetts Lowell**

Contract S963441

Monica M. Becker
Project Manager

All rights to this report belong to the Toxics Use Reduction Institute. The material may be duplicated with permission by contacting the Institute.

The Toxics Use Reduction Institute is a multi-disciplinary research, education, and policy center established by the Massachusetts Toxics Use Reduction Act of 1989. The Institute sponsors and conducts research, organizes education and training programs, and provides technical support to promote the reduction in the use of toxic chemicals or the generation of toxic chemical byproducts in industry and commerce. Further information can be obtained by writing the Toxics Use Reduction Institute, University of Massachusetts Lowell, One University Avenue, Lowell, Massachusetts 01854.

©Toxics Use Reduction Institute, University of Massachusetts Lowell

Notice

This study was funded by the Toxics Use Reduction Institute under contract number S963441 to Abt Associates Inc.. This report has been reviewed by the Institute and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Toxics Use Reduction Institute, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

EXECUTIVE SUMMARY

The Massachusetts Toxics Use Reduction Act (TURA) was passed in 1989 with the objective of reducing toxic chemical waste in the Commonwealth. In 1996, TURI contracted with Abt Associates Inc. to conduct a survey to assess the effectiveness of the Massachusetts Toxics Use Reduction Program, the set of programs and resources established to help Massachusetts firms meet the goals of the act. The results of the survey are presented in this report.

TURA establishes six goals, one of which is to encourage the regulated community to use toxics use reduction (TUR) techniques and thereby reduce toxic or hazardous byproduct generation in Massachusetts by 50 percent from 1987 to 1997. TURA does not require Massachusetts facilities to implement TUR projects, nor does it require individual facilities to meet specific reduction goals. Rather, the objectives of the Act are to be met by requiring facilities to report on their use of toxics and their generation of toxic byproducts (via the Massachusetts Form S) and by requiring facilities to undergo a biennial planning process to identify TUR opportunities. Facilities are supported in their TUR efforts by the Office of Technical Assistance for TUR (OTA), the Toxics Use Reduction Institute (TURI), and the TUR Program Office of the Massachusetts Department of Environmental Protection (DEP).

To capture the input of the greatest number of TURA-filers, a census (rather than a sample) of all TURA filers from 1993 was conducted. Filers were contacted for a telephone interview in June and July 1996.¹ A survey response rate of 67% (434 of 645) was obtained. An analysis of the respondent and non-respondent populations (discussed briefly below) indicated that survey respondents were representative of the overall TURA filing population.

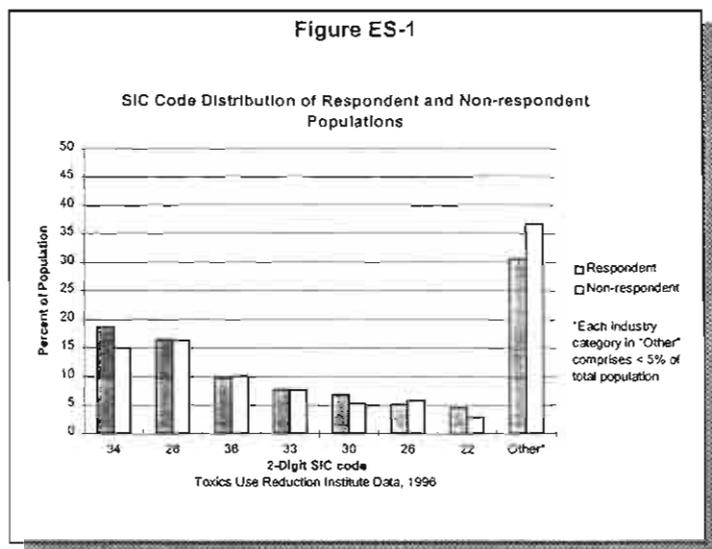
The survey included questions on a variety of topics relevant to the effectiveness of the TUR program. For example, facilities were asked about their involvement with TUR planning and project implementation, their experience with and opinion of Toxics Use Reduction Program elements, their involvement in TUR activities before and after enactment of TURA in 1990, their suggestions for improving the program, and the business impacts of TUR practices at their facilities. A quantitative assessment of the financial impact of TURA on the regulated community (based on the results of a portion of the survey that was faxed to phone survey respondents) is presented in a separate report by Abt Associates Inc., *Benefit-Cost Analysis of the Massachusetts Toxics Use Reduction Act*.

¹Database of filers from Toxics Use Reduction Institute, June 1996.

SURVEY POPULATION

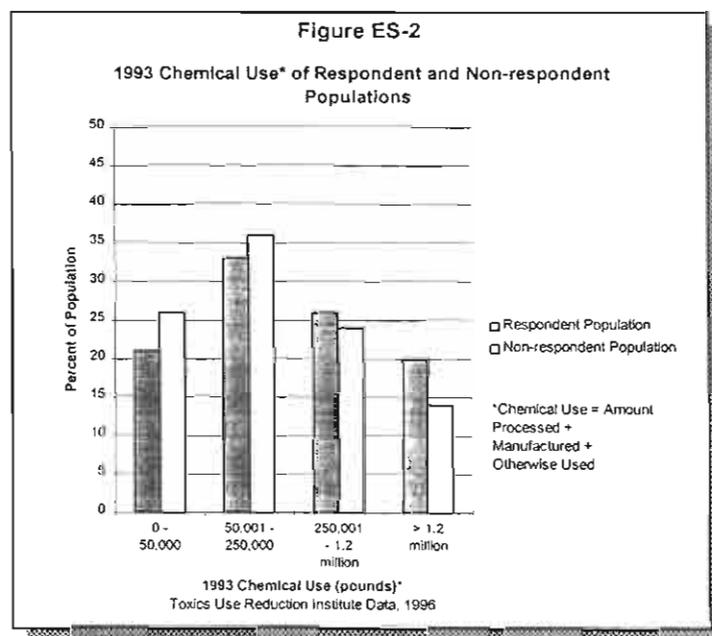
Sample bias was not a concern when analyzing survey results because the survey population was a census and not a sample. Several criteria were examined to determine if the non-respondent and respondent populations differed.

Industry sector and chemical use were two of the criteria evaluated. Overall, the seven largest industry sectors (based on 2-digit Standard Industrial Classification (SIC) codes) in the survey population accounted for 73% of facilities in the respondent population and 74% of facilities in the non-respondent population. Each of the top seven sectors was also compared individually and found to be very similar for the respondent and non-respondent populations, as shown in Figure ES-1. The analysis of chemical use for these populations also indicated that the respondent population was representative of the overall population of TURA-filers, as shown in Figure ES-2.



SURVEY FINDINGS

Facility involvement in TUR activities has increased dramatically since 1990. Respondents were asked about their facility's involvement in a number of TUR activities, listed in Table ES-1. Of these activities, the greatest number of facilities are currently involved in tracking quantities of wastes generated and chemicals used. The most significant change over time reported was in the number of facilities "very involved" in setting goals for waste reduction: 24% before 1990 and 73% in 1996. The passage of TURA is one of numerous factors potentially influencing



the increased facility attention to TUR activities since 1990. Note that respondents were asked if they were “very, somewhat, or not at all” involved in each of these activities. Only “very involved” (the highest level of involvement) responses are shown here.

Activity	Percentage of respondents “very involved” in [activity]**	
	Before 1990	Now
Tracking quantities of wastes generated	49%	89%
Tracking quantities of chemicals used	48%	90%
Reviewing changes in production processes for their environmental, health and safety impact	30%	76%
Establishing a corporate or facility environmental team	24%	68%
Setting goals for waste reduction	24%	73%
Allocating environmental costs to processes or products	21%	52%

*Total # of facilities = 434, Survey administered in June-July, 1996.
 **Note: only “very involved” responses shown.

The majority of respondents (81%) intend to implement a few, most or all of the projects identified in their 1994 plans. While firms can identify TUR projects in numerous ways, most respondents (70%) reported that the TUR planning process led to the identification of TUR projects in their facility.

The majority of facilities that have implemented TUR projects identified in their plans say they have realized benefits. Sixty-seven percent of respondents reported direct cost savings on materials use or waste disposal. Improved worker health and safety was the other major benefit of TUR implementation, as shown in Table ES-2.

Benefit	% of Respondents that “actually saw” benefit to:*		
	A great extent	Somewhat	Not at all
Cost savings	17%	50%	31%
Improved worker health and safety	21%	45%	31%
Reduced regulatory compliance requirements	11%	34%	52%
Improved environmental image	11%	27%	59%
Other benefit provided by respondent	15%	15%	-
Marketing advantage	7%	20%	72%

*Total facilities = 351. Rows may not add to 100% because refused and “Don’t Know” responses are not presented.

Eighty-six percent of respondents said they would continue to conduct TUR planning even if the legal requirement to conduct it was removed. Twelve percent (50 of 434 facilities) said they would discontinue such plans, and 2% (9 facilities) were unsure.

The most commonly cited barrier to TUR project implementation was company concern with the impact of the project on product quality. Fifty-one percent of respondents cited company concern with the impact of the project on product quality as a "very important" factor in the company's decision not to implement a TUR project. This may be one reason why 81% of respondents intended to implement at least a few of the TUR projects they identified through the 1994 planning process, but 65% of respondents said they had not implemented all of their projects.

TURA resources were found to be useful in implementing toxics use reduction by most of the respondents that have had exposure to them. Eighty-five percent of respondents who have had experience with the Toxics Use Reduction Planner Training reported that it was useful. Of the respondents that had experience with site visits from the Office of Technical Assistance (OTA), 86% found this to be a useful resource, as shown in Table ES-3.

Resource	How useful was [item] in helping your company implement TUR?		
	Very	Somewhat	Not at all
Toxics Use Reduction Planner Training	46%	39%	13%
Site visits from the Office of Technical Assistance (OTA)	42%	44%	13%
Toxics Use Reduction conferences and workshops	38%	48%	14%
Assistance from the Department of Environmental Protection (DEP)	34%	53%	12%
Toxics Use Reduction Institute (TURI) information services or library	31%	53%	15%
Getting toxics use reduction information from industry trade associations	27%	65%	7%

Respondents offered many suggestions on how the TURA program could be improved. Seventy-eight percent of respondents (340 facilities) responded to this question with some facilities offering several comments for a total of 410 suggestions. Some (40 of 340) said the TURA program should be eliminated altogether. Others (47 facilities) said that it should be left unchanged. Some respondents (66) felt the program could be improved if the paperwork burden were reduced and the reporting process were simplified. Others gave more specific recommendations for simplifying the process, such as making Form S consistent with Form R or allowing electronic filing of TURA reports. Some respondents felt that certain exemptions should be considered, such as those for wholesalers and distributors, and "manufacturers with no room for improvement." Program flexibility was an issue for some who requested that the program "recognize that some toxic chemicals have no alternatives for certain uses." Forty-eight respondents mentioned that the fees associated with filing under TURA were too high. Several mentioned that it was particularly burdensome to small businesses. One respondent suggested that "if you've reached the [50% reduction] goal, then you shouldn't have to pay fees or report yearly."

DIFFERENCES BY FACILITY TYPE

When survey responses were further evaluated based on facility size, some differences were found between the responses of small and large facilities. Small facilities (fewer than 50 employees) tended to identify TUR opportunities and implement TUR projects less frequently than larger facilities. Fifty-seven percent of these small facilities had identified opportunities for TUR in their TUR plan, compared to 74% in facilities with more than 50 employees. Seventy-three percent of the small facilities had implemented at least a few of the projects identified in their TUR plan, while 83% of the larger facilities had done so. Small and large facilities reported the same barriers to implementing projects and, for the most part, reported the same benefits, with the exception of cost savings. Small facilities were less likely than large facilities to report cost savings as a benefit of implementing TUR projects: while 28% of facilities with more than 50 employees reported they had not seen any cost savings as a result of implementing TUR projects, 41% of facilities with less than 50 employees indicated they had not seen cost savings.

Only slight differences existed between the responses of industry sectors and chemical use categories. Survey responses were also evaluated based on the 2-digit SIC code of the respondent's facility. Cost savings was one issue that showed some differences: the Rubber and Miscellaneous Plastics Products, Electrical and Electronic Equipment, and Fabricated Metal Products industries were more likely than others to see cost savings "to a great extent" from TUR project implementation, as shown in Table ES-4 below.

<i>Industry</i>	<i>To What Extent Did Your Company Actually See Cost Savings...</i>			
	<i>A Great Extent</i>	<i>Somewhat</i>	<i>Not At All</i>	<i>Number of Facilities*</i>
Rubber and Miscellaneous Plastics Products (SIC 30)	29%	43%	25%	28
Electrical and Electronic Equipment (SIC 36)	28%	58%	14%	36
Fabricated Metal Products (SIC 34)	23%	52%	23%	71
All Other Industries	12%	49%	38%	216

*Total number of facilities = 351

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
I. INTRODUCTION	1
A. Overview	1
B. TURA Requirements	2
II. SURVEY METHODOLOGY	4
A. Survey Administration	4
B. Selection of 1993 Filers as the Survey Population	4
C. Telephone Survey Design and Respondent Selection	5
D. Steps Taken to Reduce Survey Bias	5
E. Examination of Non-respondent Bias	5
Chemical Use Data	6
Industry Type	7
TRI Reporters	7
TURPs Associated With the Facility	7
III. DISCUSSION OF RESULTS	9
A. Chapter Organization	9
B. Profile of Respondents	9
C. TUR Planning and Project Implementation	12
1. Identifying TUR Opportunities through the TUR Planning Process	12
2. Implementing TUR Projects	13
3. Barriers to Implementing TUR Projects	16
4. Value of the Components of the TUR Planning Process	18
5. TUR Practices at Reporting Facilities	19
6. Would Facilities Plan Voluntarily?	21
D. Value of Available TURA Resources	22
E. Is Toxics Use Reduction Good Business Practice?	27
F. Program Modification Suggestions	31
IV. SURVEY TEXT AND RESULTS	34
APPENDICES	
Appendix A: Open-ended Responses to the question: <i>What would you change about the TURA program?</i>	A-1
Appendix B: Survey Population by Two-Digit SIC Code	B-1

INDEX OF TABLES AND FIGURES

TABLES

Table ES-1. Facility Involvement in Toxics Use Reduction Activities, Before 1990 and Now	iii
Table ES-2. Benefits from TUR Project Implementation	iii
Table ES-3. Opinion of TURA Program Resources	iv
Table ES-4. Association of SIC Code with Extent to Which Companies Saw Cost Savings	v
Table 1. Total 1993 Chemical Use of Survey Population	6
Table 2. Industrial Categories In Survey Respondent Populations	7
Table 3. Facility Size as Reported by Survey Respondents	10
Table 4. Top 7 Respondent Industrial Categories, Examples of TURA Facility Activities	11
Table 5. Reduction in Net Toxics Use Since 1990 vs. TUR Project Implementation	15
Table 6. Reduction in Net Byproduct Use Since 1990 vs. TUR Project Implementation	15
Table 7. Barriers to TUR Project Implementation	17
Table 8. Value of TUR Planning Process Components	18
Table 9. Contribution of the TUR Planning Process to TUR Practices	20
Table 10. Continue to Plan vs. TUR Project Implementation	21
Table 11. Opinion of TURA Program Resources	23
Table 12. Facility Chemical Use and Opinion of TURA Resources	25
Table 13. Consultant Use and Exposure to TURA Program Resources	26
Table 14. Effect of Consultant Use on Opinion of TURA Program Resources	26
Table 15. Facility Involvement in Toxics Use Reduction Activities, Before 1990 and Now*	27
Table 16. Benefits from TUR Project Implementation	28
Table 17. Other Benefits Provided by Respondents from Implementing TUR Projects	29
Table 18. Frequency of Cost Savings, According to Facility Size	29
Table 19. Association of SIC Code with Extent to Which Companies Saw Cost Savings	30
Table 20. Improved Environmental Image From TURA vs. Facility Chemical Use Category	31
Table 21. What would you change about the TURA program?	32

FIGURES

Figure ES-1. SIC Code Distribution of Respondent and Non-respondent Populations	ii
Figure ES-2. 1993 Chemical Use of Respondent and Non-respondent Populations	ii
Figure 1. 1993 TURA Population by 2-digit SIC code	11

I. INTRODUCTION

A. Overview

In 1989, the Commonwealth of Massachusetts' Toxics Use Reduction Act (TURA - MGL 21I) was passed with the objective of reducing toxic chemical waste in the Commonwealth. The Act established six goals, one of which is to reduce toxic or hazardous byproduct generation in Massachusetts by half by the year 1997 from a baseline year of 1987. The Act promotes a variety of activities that would support reductions in toxic chemical waste, including: input substitution; product reformulation; product unit redesign or modification; product unit modernization, improved operation, and maintenance; and recycling, reuse, or the extended use of toxics (MGL Ch.21I§13(A)).

TURA does not require that Massachusetts facilities implement TUR projects, nor does it require that individual facilities meet specific reduction goals. Rather, the objectives of the Act are to be met by focusing the facility's attention on existing opportunities for toxics use reduction in their operations. This objective is met by requiring facilities to report on their use of toxics and their generation of toxic byproducts, as well as by requiring them to undergo a planning process to identify opportunities for toxics use reduction. Technical education, research, and regulatory support for TURA-reporting facilities is provided through the Office of Technical Assistance for TUR (OTA), the Toxics Use Reduction Institute (TURI), and the TUR Office of the Massachusetts Department of Environmental Protection (DEP).

In 1996, TURI set out to assess the effectiveness of the Massachusetts Toxics Use Reduction Program in promoting toxics use reduction in Massachusetts businesses. TURI contracted with Abt Associates Inc. to conduct a survey. To capture the input of the greatest number of TURA-filers, TURI elected to conduct a census (rather than a sample) where all filers from the selected year (1993) were contacted for a telephone interview in June and July, 1996.² Because feedback from the greatest number of facilities completing a TUR Plan was sought, the 1993 filers were chosen over the 1994 filers. Although 1994 was the most recent reporting year available at the time of the survey, a number of 1993 filers fell below the reporting threshold in 1994 and were not required to report. Of the 1993 filers, a survey response rate of 67% (434 of 645) was obtained. An analysis of the respondent and non-respondent populations indicated that survey respondents were representative of the overall TURA filing population.

The survey was conducted with both a telephone interview of TURA reporters and a written fax survey to collect data for a benefit-cost analysis. The results of the fax survey are analyzed in a separate report by Abt Associates Inc., *Benefit-Cost Analysis of the Massachusetts Toxics Use Reduction Act*. The results of the program evaluation telephone survey are presented in this report. Survey methodology is described in Chapter II. Chapter III examines the survey responses along the following thematic lines:

²Database of filers from Toxics Use Reduction Institute, June 1996.

- ▶ TUR Planning and Project Implementation
- ▶ Value of Available TURA Resources
- ▶ Is Toxics Use Reduction Good Business Practice?
- ▶ Suggestions from Respondents for Program Modifications

The survey questions and the results for each question are presented in Chapter IV.

B. TURA Requirements

As of 1996, approximately 600 Massachusetts facilities are subject to the planning and reporting requirements of TURA. Massachusetts facilities are required to file Form S annually if they satisfy all of the following criteria during a given reporting year:

- ▶ employ the equivalent of at least 10 full-time employees;
- ▶ conduct *any* of the business activities defined within Standard Industrial Classification (SIC) codes 10-14, 20-39, 40, 44-51, 72, 73, 75, and 76; and
- ▶ qualify as a large quantity toxics user (LQTU).

TURA defines an LQTU as any facility that manufactures or processes 25,000 pounds or more of a toxic substance or otherwise uses 10,000 pounds or more of a toxic substance. Facilities that satisfy either of these threshold quantities must report on every listed toxic substance that they manufacture, process or otherwise use at an amount equal to or greater than 10,000 pounds. As a result, certain manufactured or processed chemicals in the range of 10,000 to 25,000 pounds are reportable under TURA. Toxic substances subject to TURA reporting include any of the toxic substances identified by either of two federal programs: the Section 313 EPCRA list for reporting to the Toxics Release Inventory (TRI) and any chemical on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) reportable quantities list.

TURA reporting differs primarily from TRI reporting in that TURA requires chemical use reporting (as opposed to only chemical releases) and it requires the development of a toxics use reduction (TUR) plan. The planning process is intended to help firms identify more efficient production methods that will both prevent pollution and save money. TURA requires that plans be certified by "Toxics Use Reduction Planners," or TURPs, who have themselves passed a uniform certification examination developed by the Massachusetts DEP. Because TUR planning is intended to be a continuous process, plans must be updated and recertified every two years. While TURA does require TUR planning and reporting, it does not require that facilities implement toxics use reduction projects, nor does it require that toxics be reduced.

Although the specific guidelines for conducting TUR planning are somewhat flexible, leaving companies free to use whatever process and format is most useful and efficient, all TUR plans must contain the following elements:

- ▶ *Management policy statement* describing company policies regarding toxics use reduction;
 - ▶ *Scope of plan* describing the production units and chemicals included in the plan and the types of TUR techniques evaluated;
 - ▶ *Employee notification* to solicit ideas from every member of the company on increasing the efficiency of chemical use and reducing waste;
 - ▶ *Process characterization*, for each production unit/chemical combination, including a discussion of the purpose of each chemical in the process, unit of product, process flow diagram, and a materials accounting describing total inputs and outputs of the chemical in the production unit;
 - ▶ *Costs of toxics* describing the total costs of using a toxic chemical in each production unit;
 - ▶ *Options identification, evaluation, and implementation.*
 - *Identify* the universe of TUR options available to the firm;
 - *Evaluate* the universe of options to determine if any are not technically or economically feasible; and
 - *Decide* which -- if any-- of the options will be *implemented*.
- For those options that the facility plans to implement, the regulations require that an implementation schedule be developed specifying the reductions in toxic chemicals used and projected amounts of generated byproduct;
- ▶ *Certification* by the senior plant manager and a DEP approved Toxics Use Reduction Planner (TURP); and,
 - ▶ *Plan summary* to be submitted to DEP.

II. SURVEY METHODOLOGY

A. Survey Administration

The survey was conducted in three steps: a notification advance letter, a telephone interview, and a written survey sent by fax. The advance letter, sent to all 1993 TURA filers³, described the evaluation project and the need for their participation, and notified them that they would be receiving a phone call from an interviewer. The phone survey was administered using computer assisted telephone interviewing (CATI), a process by which the interviewer reads questions from a computer screen and enters responses directly into the database, thus minimizing data processing errors and time. The total number of facilities in the 1993 survey population was 645. Of the 645 1993 TURA filers, 434 phone surveys were completed for a response rate of 67%. Non-respondents were categorized by their reason for not completing the survey: 16% (104) were facilities that decided not to participate in the survey; 11% (72) were a result of schedule conflicts during the study's time frame; 3% (20) were companies that had gone out of business; 2% (11) ended participation while the survey was being administered; and the remaining 1% (4) were due to unavailable phone numbers.

Interviews were conducted during five weeks in June and July of 1996 by interviewers briefed on the requirements of TURA and the purpose of the survey. The average time required to complete the telephone survey was 13 minutes.

At the conclusion of the telephone survey, participants were asked if they would be willing to participate in the written fax portion of the survey. The written fax survey was intended to collect data for a benefit-cost analysis. Of the 434 respondents that participated in the telephone survey, 420 agreed to participate in the written fax portion. Of the 420 fax surveys administered, 215 were returned with varying response rates for each of the five questions. The results of the written fax survey are analyzed in a separate report by Abt Associates Inc. under contract to TURI, *Benefit-Cost Analysis of the Massachusetts Toxics Use Reduction Act*.

B. Selection of 1993 Filers as the Survey Population

The survey population consisted of 1993 TURA data filers. The 1993 filers were selected for this survey to maximize the number of respondents that had been through the TUR planning process and to capture firms that might have dropped out of the Program in subsequent years as a result of TUR implementation. Approximately 40 of the 1993 filers did not file again for 1994 and were thereby not required by law to plan (although they may have done so).

³Database of filers from Toxics Use Reduction Institute, June 1996.

C. Telephone Survey Design and Respondent Selection

Survey design and respondent selection were used to identify the employee most knowledgeable about toxics use reduction activities at a particular facility. Names and telephone numbers for each facility's Toxics Use Reduction Planner (TURP), Toxics Release Inventory Technical Contact, and Form S senior management signatory were collected from the Toxics Use Reduction Institute (TURI) and the 1994 Toxics Release Inventory (TRI) Public Data Release for all 1993 TURA filers. Interviewers asked first for the TURP. If unavailable, the interviews were conducted with the TRI Technical Contact or, lastly, with the Form S signatory. In all cases, the respondent was asked a confirmation question: "Are you the employee, and not a consultant, of this company (at this location) who knows the most about your toxics use reduction activities?" If the answer to this question was "no," the respondent was prompted to provide the appropriate contact name and telephone number.

D. Steps Taken to Reduce Survey Bias

A variety of steps were taken to reduce strategic responses and other bias in the telephone survey. Strategic responses occur when respondents alter their answers in an attempt to influence conclusions drawn from the survey overall or from their response in particular. Such responses can be particularly problematic during evaluations where respondents may think that the survey outcome may directly alter regulatory requirements, alter resources available, or result in additional scrutiny by regulatory agencies. To reduce strategic answering, the respondents were guaranteed anonymity at the outset of the survey. Second, interviewers described the importance of the respondents' input in the overall program evaluation and explained how the results would be used. Third, open-ended responses were offered for questions asking respondents to rank information. Respondents could therefore offer their own response, even if it was not available in the answer categories. For example, respondents were asked if their company actually saw certain benefits from TUR planning. After responding to a list of possible benefits read by the interviewer, respondents were asked if there "was some other benefit from implementing TUR projects?" Thirty percent gave an additional benefit. The responses were recorded verbatim and then categorized following review of all responses.

A draft version of the survey was administered to 12 randomly selected facilities to pretest the survey instrument for suitability of its length and complexity. Some questions were removed after the pretest to shorten survey length, but the remaining questions were not modified significantly. Because these remaining questions were almost identical to those asked on the final survey, results from the pretest were included in the final survey results for the analysis.

E. Examination of Non-respondent Bias

Interviewers attempted to contact all facilities filing under TURA for 1993. Because the survey was a census of all available facilities, as opposed to a sampling, any differences or similarities among values are actual and not due to the chance selection of a non-representative

subpopulation for a survey sample. Potential for bias still exists, however. If there are significant differences between the respondent population (434 facilities) and non-respondents (211 facilities), then the survey results may not accurately reflect the opinions and activities of all TURA-reporting firms.

To determine the extent of respondent bias in the survey results, the respondent and non-respondent populations were compared on several criteria: total chemical use, industry type, Toxics Use Reduction Planner activity, and TRI reporting status. As presented below, the respondent and non-respondent populations are almost identical when compared by industry type, total chemical use, and TRI reporting. The percentage of facilities with an on-site Toxics Use Reduction Planner differs slightly between respondents and non-respondents. The consistency of these criteria indicates that respondent bias in this survey is unlikely, although the possibility of bias from other unexamined factors remains.

Chemical Use Data

Chemical use is an important consideration for bias between the respondent and non-respondent populations. Facilities that use very large quantities of chemicals may respond differently to TURA than facilities that use lesser quantities. Total 1993 chemical use was calculated for each facility by summing the amount of TURA chemicals processed, manufactured, and otherwise used according to TURA Form S data. A comparison of the total TURA population to the telephone survey respondent and non-respondent populations does not indicate any large differences in the distribution of chemical use across these groups. As chemical use distribution is consistent across these chemical use groups, bias based on the chemical use of the responding facility is not an issue for this survey.

Table 1. Total 1993 Chemical Use of Survey Population			
<i>Range of Chemical Use (pounds)*</i>	% of Facilities in Range		
	<i>Total Survey Pop.</i>	<i>Telephone Survey Respondents</i>	<i>Telephone Survey Non-respondents</i>
1 - 50,000	23%	21%	26%
50,001- 100,000	13%	13%	13%
100,001 - 150,000	9%	9%	11%
150,001 - 200,000	6%	6%	6%
200,001 - 250,000	5%	5%	6%
250,001 - 1,200,000	25%	26%	24%
>1,200,000	19%	20%	14%
Total %	100%	100%	100%
Number of Facilities**	631	424	207

*Total TURA Chemical Use (Pounds) = Amount Processed + Amount Manufactured + Amount Otherwise Used

** Total number of facilities=Number of facilities in population for which chemical use data were available. TURA data supplied by the Toxics Use Reduction Institute, 1996

Industry Type

The 1993 TURA population includes facilities distributed across 28 different industries as defined by two-digit standard industrial classification (SIC) code (See Appendix B for full listing). Prior to the survey administration, SIC codes were assigned to each TURA-reporting facility by TURI based on the SIC code they reported as their primary business in their 1993 TRI report. If one SIC was reported for the facility it was used; if multiple SICs were reported, a primary code was chosen based on knowledge of the firm's processes and products. Seven industries account for 71% of the TURA-reporting facilities. The distribution of major industry categories in the survey respondent and non-respondent populations is almost identical, as shown in Table 2; therefore, industry sector-based bias is not considered to be an issue for the survey.

Table 2. Industrial Categories In Survey Respondent Populations				
SIC	Text	<i>Percent of Total Facilities</i>		
		<i>Survey Population</i>	<i>Respondent Population</i>	<i>Non-respondent Population</i>
34	Fabricated Metal Products	18%	19%	15%
28	Chemicals and Allied Products	16%	16%	16%
36	Electrical and Electronic Equipment	10%	10%	10%
33	Primary Metal Industries	8%	8%	7%
30	Rubber and Miscellaneous Plastic Products	8%	8%	8%
26	Paper and Allied Products	6%	7%	5%
22	Textile Mill Products	5%	5%	6%
	All Other SIC codes ⁴	29%	27%	32%
Total Number of Facilities in Population		644	434	208
SIC code data supplied by Toxics Use Reduction Institute, 1996.				

TRI Reporters

The percentage of TRI reporters in the respondent and non-respondent populations were almost identical; 86% of TURA-reporters, 86% of the respondent survey population, and 85% of the non-respondent population has a TRI number. The almost equal distribution of TRI reporters in the respondent and non-respondent groups and the TURA reporters population is an additional indication that the potential for bias from non-respondents in the survey is minimal.

TURPs Associated With the Facility

According to TURI data, 28% of the TURA population had an in-house TURP associated with the facility. Respondents were more likely to have a TURP associated with their facility than non-respondents. Thirty-three percent of survey respondents (142 of 434 facilities) had a TURP

⁴Each of the other industry sectors comprised less than 5% of the survey population.

associated with their facility, as compared with only 18% (39 of 211) of non-respondents.

The higher percentage of TURPs in the respondent population may be due to a variety of factors. Facilities with TURP contacts may be less likely to refuse to be interviewed because the most appropriate individual was already identified. For example, 12% of non-responses were due to a 'gatekeeper' (e.g., secretary) refusing access to potential respondents. Because the TURP telephone numbers were available from the TURI database they could be contacted directly or asked for by name. Telephone numbers were not available from the TURI database for Form S signatories, so interviewers had to pass through a gatekeeper to access these respondents. Another reason may be that TURPs were more willing to participate in the survey due to their greater knowledge about and involvement with the program.

Whether and how the higher percentage of TURPs in the respondent population might bias the results is unclear. The TURP respondent has invested time and energy in TURP training and may view the program differently than other respondents. Because of their detailed knowledge of the program, they may have a better understanding of its strengths and weaknesses, and consequently may respond differently than non-TURP respondents. In some cases these differences may result in a more positive view of the TURA program, but in others there may be a more negative view. The overall effect of TURP respondent bias on survey results is assumed to be negligible in this analysis.

III. DISCUSSION OF RESULTS

A. Chapter Organization

This chapter discusses the results of the TURA survey along four thematic lines:

- ▶ TUR project implementation and planning requirements
- ▶ Value of available TURA resources
- ▶ Is TUR good business practice?
- ▶ Suggestions for TURA program modifications from survey respondents

In the discussion of each theme, data are presented and analyzed for all survey respondents first, then examined by three different respondent categories: facility size (employee number), industry type, and chemical use. The characteristics of each category are explained below in the Profile of Respondents section. A copy of the survey questionnaire and the results for each question are presented in Chapter IV.

B. Profile of Respondents

Of the 434 survey respondents, 60% (260 facilities) said their facility's net use of toxic chemicals per unit of production had decreased since 1990, 22% (97 facilities) reported no change, and 10% (42 facilities) said their net use of toxics had increased. Survey respondents were also asked whether their facility would be required to report to TURA for 1995. A large portion (87%) said they still met the reporting requirements, while 10% (45 facilities) were not required to report in 1995. Most facilities that did not have to report to TURA in 1995 (34 of 45 facilities) were exempt because they no longer used a listed chemical or no longer met the reporting threshold. Another five facilities responded they were no longer required to report because of a change in their production process.

Facility size

The survey responses were subdivided into employment categories to identify aspects of the TURA program that may be associated with facility size. During the survey, respondents were asked to report the number of employees at their facility. The employment categories and the distribution for the survey respondents are shown in Table 3.

Table 3. Facility Size as Reported by Survey Respondents		
<i>Number of Employees</i>	<i>Percent of Respondents*</i>	<i>Number of Facilities</i>
1 to 9	1%	4
10 to 49	25%	108
50 to 99	23%	98
100 to 499	42%	180
Over 500	10%	44
*Total number of respondents = 434		

If their facility was part of a larger organization, respondents further characterized their structure. Fifty-six percent (247 of 434) of respondent facilities were single location companies, 22% (94 facilities) were multi-location companies, and 21% (93 facilities) were characterized as multinational companies.

Industry Type

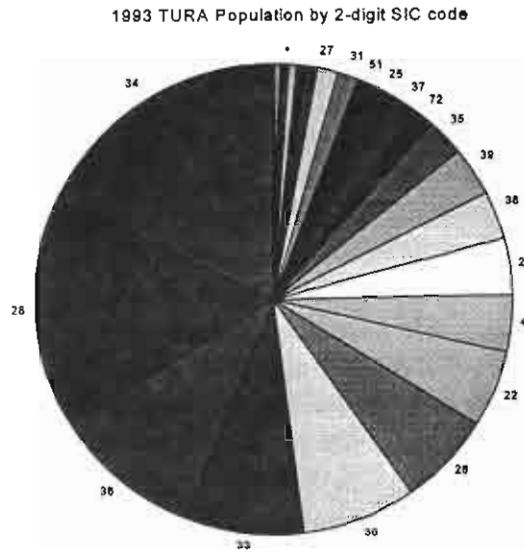
To identify associations specific to a certain industry sector, survey responses were summarized by two-digit SIC codes. As mentioned above, the 1993 TURA population contains 28 different industries as defined by two-digit SIC codes. Seventy-one percent of the TURA facilities fall within seven SIC codes; each of the other 21 codes comprise less than 5% of the respondent population. Because each of the other industry sectors contained only a few facilities, meaningful comparisons among all 28 industries were not possible. Instead, the responses of the seven largest industry populations were reviewed for this analysis.

It should be noted that a diverse array of products and processes can be included in a single two-digit SIC code. The results of this analysis should be viewed with this in mind. Analysis by three-or four-digit SIC code could be an interesting subject for future research. The list of all other SIC codes in the TURA population and the number within each category are presented in Appendix B. Respondent facilities fell into these categories in the proportions shown in Figure 1.

Types of Facilities in Top Seven SIC Codes

By categorizing respondents by two-digit SIC code, comparisons among groups of facilities that have very different operations can be made, but this categorization may hide important differences among facilities in the same sector. Not all facilities in the same two-digit SIC code conduct similar operations; thus, facilities in the same sector may respond differently to survey questions. It should not be assumed that industry sector results apply to every facility in a particular two-digit SIC code. Some specific examples of facility activities from the top seven two-digit SIC codes are presented in Table 4.

- Figure 1 -



Data from Toxics Use Reduction Institute, 1996

* SIC Codes Not Shown: 17, 23, 24, 29, 32, 45, 47, 75, 76

Table 4. Top 7 Respondent Industrial Categories, Examples of TURA Facility Activities

<i>SIC</i>	<i>Industry Sector</i>	<i>Examples of Specific Facility Activity</i>
34	Fabricated Metal Products	Plating and Polishing, Sheet Metal Work, Hand Saws and Saw Blades, Cutlery, Iron and Steel Forgings
28	Chemicals and Allied Products	Paints and Allied Products, Plastics Materials and Resins, Industrial Organic Chemicals, Cyclic Crude and Intermediates, Printing Ink
36	Electrical and Electronic Equipment	Printed Circuit Boards, Semiconductors and Related Devices, Residential Lighting Fixtures, Electronic Components, Motors and Generators
33	Primary Metal Industries	Copper Rolling and Drawing, Nonferrous Wire Drawing and Insulating, Steel Foundries, Cold Finishing of Steel Shapes, Copper Foundries
30	Rubber and Miscellaneous Plastic Products	Fabricated Rubber Products, Unsupported Plastics Film and Sheets, Plastics Pipe, Plastics Foam Products, Rubber and Plastic Footwear
26	Paper and Allied Products	Paper Mills (Except Building Paper), Paper (Coated and Laminated), Envelopes, Paperboard Mills, Sanitary Food Containers
22	Textile Mill Products	Coated Fabrics (Not Rubberized), Weaving Mills (Cotton or Synthetics), Thread Mills, Knitting Mills

Toxics Use Reduction Institute Data, 1996.

Chemical Use

The quantity of TURA chemicals used at a facility was also examined to elucidate its possible influence on the facilities' opinions of and experiences with the TURA program. Facility chemical use was calculated by summing the amount of TURA chemicals processed, manufactured, and otherwise used at each facility in 1993 according to TURA Form S data. The population was divided into four different size categories as follows:

- less than 50,000 pounds
- 50,001 to 250,000 pounds
- 250,001 to 1,200,000 pounds
- greater than 1,200,000 pounds

These categories were chosen because each contains roughly one-quarter of the respondent population. The facilities contained within each chemical use category were examined by 2-digit SIC code to determine if any industry sectors might be over represented in a particular category and thus bias results. Industry types were found to be distributed evenly amongst the four chemical use categories.

C. TUR Planning and Project Implementation

1. Identifying TUR Opportunities through the TUR Planning Process

Because the primary purpose of the TUR planning process is to identify opportunities within facilities for toxics use reduction, survey respondents were asked if they had indeed identified TUR opportunities *as the result of* their 1994 planning process. Seventy percent of respondents (302 facilities) answered that they had identified such opportunities. Twenty-five percent (109 facilities) said that no opportunities had been identified, and five percent (23 facilities) did not know.

A 70% positive response indicates that the planning process itself does indeed help facilities take the first steps toward reducing their toxics use; without the systematic process review and planning requirements of TUR, opportunities identified as part of their plan development may not have otherwise been discovered. It should be noted, however, that TUR activities previously planned by facilities can be included in the TUR plan required by TURA. The survey question, if understood correctly by respondents, should not include those opportunities identified by means other than the planning process.

Differences Among Respondent Groups

a. Facility Size

Small facilities were less likely than large facilities to identify opportunities for toxics use reduction. While 57% (63 of 111) of facilities with fewer than 50 employees identified TUR opportunities as the result of the planning process in 1994, 74% (239 of 323) of the larger facilities (those with more than 50 employees) identified TUR opportunities. Large facilities may have more processes, products, chemicals, and therefore more opportunity for TUR. In addition, this difference may be attributed to differences between small and large facilities in the resources available to develop a thorough plan. One respondent noted, “A small company can’t afford the man-hours.” Another possible explanation is that large facilities may have additional experience from conducting their own toxics use reduction planning prior to the TURA requirements. Facilities with fewer than 50 employees consistently reported being less involved with TUR activities prior to 1990 than did larger facilities. For example, 82% of facilities with more than 50 employees reported that they tracked quantities of waste generated prior to 1990, whereas 73% of facilities with fewer than 50 employees did.

b. Industry Type

Chemicals and Allied Products (SIC 28) and Primary Metal (SIC 33) industries were less likely than other industry categories to identify opportunities for toxics use reduction as a result of the 1994 plan. While 56% of respondents in SIC 28 and 33 identified TUR opportunities, approximately 74% of all other facilities had identified such opportunities. Many facilities in both of these industrial sectors use TURA chemicals as feedstock in their manufacturing operations; therefore, their ability to reduce their chemical use while meeting customer demands may be more limited than in some other industries. One respondent said, “When a company uses a chemical as a product, they can’t replace it...there should be exceptions made for people who have toxins as a product.”

c. Chemical Use

Identification of TUR opportunities as a result of the TURA plan did not vary by facilities’ chemical use. In fact, the largest and smallest toxic chemical users had the same proportion (67%) of facilities that identified TUR opportunities.

2. Implementing TUR Projects

In the TURA planning process, filers identify TUR opportunities for each toxic chemical used in each production unit in the facility. They then evaluate which opportunities could potentially achieve toxics use reduction, determine which options are technically and economically feasible, and develop an implementation schedule to track progress for those options chosen for implementation. TURA does not *require* that facilities implement toxics use reduction projects identified. While implementation of projects may be motivated by TURA, they are voluntarily

undertaken by facilities. In the survey, facilities were asked how many of the TUR projects selected for implementation have been, or will be, fully implemented. They were asked to respond: *all, most, a few, or none.*

Eighty-one percent of respondents (351 of 434 facilities) have or will fully implement at least a few of the projects selected for implementation in their 1994 plan. Nine percent (41 facilities) of respondents did not think that any of the projects would actually be implemented.

Some facilities that did not *identify* TUR opportunities as a result of the TURA planning process still said they *implemented* projects from their 1994 plan. For example, 27% (30 of 111) of those facilities claiming to have implemented all of the TUR projects "selected for implementation in [the] 1994 TUR plan" also said they did *not* "identify any opportunities for toxics use reduction as the result of [the] 1994 TUR plan."

There are several possible explanations of this finding. While the identification question asked if projects were identified "*as the result of*" the 1994 TUR plan, the implementation question asked how many of the TUR projects *selected for implementation* in the 1994 plan were actually implemented. TUR projects that were not identified through the planning process, but were included in the plan, qualify for the implementation question. This finding indicates that facilities are identifying TUR opportunities through methods other than the planning process and were probably already implementing a TUR project that was not driven by TUR planning.

An interesting comparison is a facility's change in its toxics use or byproduct production (have they increased, decreased, or remained unchanged?) since 1990 and whether it implemented projects identified in its 1994 TUR plan. Survey respondents were asked if overall toxics use and byproduct production at their facilities had increased, decreased, or remained the same since 1990. These responses were based on the respondents' knowledge of their operations and were not confirmed by an analysis of the facilities' TURA data. Based on these responses, 67% of facilities that have implemented at least a few of the projects identified in their TUR plans said they have successfully reduced their toxics use since 1990, as shown in Table 5. Toxics use has either remained unchanged or increased at 27% of these facilities. In contrast, only 22% of the facilities that have *not* implemented any of their identified TUR projects have reduced their toxics use, while at 66% of these facilities toxics use has increased or remained unchanged since 1990.

Table 5. Reduction in Net Toxics Use Since 1990 vs. TUR Project Implementation			
<i>Proportion of Projects Implemented from 1994 Plan</i>	<i>% Respondents* Saying Toxics Use Since 1990 Has:</i>		
	<i>Increased or Remained Unchanged</i>	<i>Decreased</i>	<i>Don't Know</i>
All, Most, or A Few	27%	67%	5%
None	66%	22%	12%
*Total number of respondents = 434			

The relationship between 1994 TUR project implementation and byproduct reduction per unit production was similar to the relationship between project implementation and net toxics use, as shown in Table 6.

Table 6. Reduction in Net Byproduct Since 1990 vs. TUR Project Implementation			
<i>Proportion of Projects Implemented from 1994 Plan</i>	<i>% Respondents* Saying Toxics Use Since 1990 Has:</i>		
	<i>Increased or Remained Unchanged</i>	<i>Decreased</i>	<i>Don't Know</i>
All, Most, or A Few	32%	61%	7%
None	61%	27%	12%
*Total number of respondents = 434			

The association between implementation of 1994 TUR projects and overall toxics use and byproduct generation reduction since 1990 may indicate that facilities implementing TUR projects from the 1994 plan have a long-standing commitment to TUR or have benefited from TUR practices in the past. Facilities that have not attempted and/or benefited from previous successes in toxics use reduction may have less incentive to implement additional TUR projects.

Differences Among Respondent Groups

a. Facility Size

Small firms were less likely than larger firms to have implemented the TUR projects selected in the 1994 plan. Sixteen percent (18 of 111) of facilities with fewer than 50 employees had not implemented any of their identified projects, whereas only 7% (23 of 323) of larger facilities had not implemented any identified projects. As noted previously, the fact that small facilities were also less likely than larger facilities to identify TUR opportunities as a result of their plan is one explanation of why smaller facilities implemented fewer TUR projects. As discussed below under *Barriers to Implementing TUR Projects*, lack of capital availability at smaller facilities may be another reason for the lower proportion of project implementation among small facilities.

b. Industry Type

Overall, an average of 9% (41 of 434 facilities) of survey respondents did not think that any of the projects identified in their 1994 plan would actually be implemented. When the responses were examined based on primary SIC code, one industry category deviated from the average. This exception was the Primary Metal (SIC 33) industry where 21% (7 of 34) of facilities indicated that “none” of the TUR projects will be implemented. The fact that Primary Metals facilities were less likely than facilities in other industry sectors to identify TUR opportunities as a result of their plan is likely to contribute to lower implementation rates.

c. Chemical Use

Implementation of TUR opportunities did not vary by facilities’ chemical use.

3. Barriers to Implementing TUR Projects

While 81% of respondents had or will implement at least a few of the TUR projects they identified through the planning process, 65% (281 of 434) of respondents said they had not implemented *all* of the projects selected for implementation in the plan. These respondents were asked which, if any, factors were barriers to implementation. The most important barrier was company concern with impact on product quality; 71% of respondents (198 of 434) said this was very or somewhat important. All of the responses are summarized in Table 7.

Table 7. Barriers to TUR Project Implementation

<i>Factor</i>	<i>How important were each of the following factors in your company's decisions not to implement TUR projects?*</i>		
	<i>Very</i>	<i>Somewhat</i>	<i>Not at all</i>
Company concern with impact on product quality	51%	20%	27%
Customers not accepting change in the product	31%	14%	51%
Capital not readily available	26%	26%	46%
Lack of management support for changes	9%	20%	66%

*Total number of facilities not implementing all projects = 281
Row totals may not equal 100% because of "Don't Know" or refusal responses.

Differences Among Respondent Groups

a. Facility Size

Barriers to TUR implementation did not vary significantly across facility size classes.

b. Industry Type

The Electrical and Electronic Equipment (SIC 36) and Fabricated Metal Products (SIC 34) industries were the most likely to claim that capital availability was a barrier to TUR project implementation. In these two industry sectors, 64% and 63% of facilities, respectively, reported lack of capital as "very important" or "somewhat important" to their decision not to implement all projects, compared to 48% for all other industries.

In contrast, the Primary Metal (SIC 33) and Paper and Allied Products (SIC 26) industries were less likely than other industry groups to say availability of capital was a reason for not pursuing TUR projects; 63% of Primary Metal (15 of 24) and 62% of Paper and Allied Products (13 of 21) industries indicated capital availability was "not at all" a factor. For all other facilities, 43% (102 of 236) reported that availability of capital was not a barrier.

c. Chemical Use

There was some variation in reasons for lack of TUR implementation examined by chemical use category. Facilities using less than 50,000 pounds reported that capital availability was *not* a barrier (66%; 27 of 41) in greater proportion than other facilities (43%; 103 of 237). Respondents in the highest chemical use category (greater than 1.2

million pounds) reported that lack of management support for changes was a barrier (36%; 24 of 66) in greater proportion than other facilities (26%; 55 of 212).

4. Value of the Components of the TUR Planning Process

The survey asked all respondents which specific component of the TUR planning process was the most valuable to their company. They were also asked to state which was the least valuable. Results are shown in Table 8.

Table 8. Value of TUR Planning Process Components			
<i>Process component</i>	<i>% Most Valuable Responses*</i>	<i>% Least Valuable Responses*</i>	<i>Combined score</i>
Materials accounting (of toxic chemical use and byproduct generation)	30%	12%	18
The development of TUR options	22%	10%	12
The development of byproduct reduction goals	16%	24%	-8
The cost of toxics calculation	11%	23%	-12
The financial evaluation of TUR options	9%	18%	-9
Don't know/Refused	12%	13%	-1
*Total responses = 434			

The combined scores of each component are calculated by subtracting the percentage of respondents that answered "least valuable" from the percentage reporting "most valuable." *Materials Accounting* and *Development of TUR Options* were the most favorably viewed components of the program. Combined, these two components were chosen by 52% of the respondents as the most valuable parts of the TUR planning process.⁵ The two financial-based components, *Cost of Toxics Calculation* and *Financial Evaluation of TUR Options*, and *Developing Byproduct Reduction Goals*, were the least popular options; together these three planning components comprised 65% of all "least valuable" responses.

⁵It is important to note that this question is a relative ranking of most or least valuable, but does not provide an absolute score of good or bad for each element. One of the options could still be considered useful to a respondent, but simply be not as useful as other parts of the TUR planning process.

Differences Among Respondent Groups

a. Facility Size

Responses from small facilities differed from other respondents on which components were most and least valuable. Forty-two percent (47 of 111) of facilities with fewer than 50 employees chose *Materials Accounting* as the most valuable part of the planning process. All other options followed in popularity at 9% to 15% each. When asked about the least valuable part of the planning process, *Development of By-product Reduction Goals* was chosen more often than other choices by small facilities; 28% (31 of 111) chose this option. All other options were selected by 9% to 17% of the respondents as least valuable.

b. Industry Type

Responses to the question of the least valuable components of the planning process did not differ across industry sectors. "Most valuable" responses were similar to the average across all industry sectors with the exception of the Chemicals and Allied Products (SIC 28) industry. In this industry 49% (35 of 71) of the respondents indicated that *Materials Accounting* was the most valuable part of the planning process. On average, 26% of other industry categories (96 of 363) said that it was the most valuable part of the process.

c. Chemical Use

Results were similar across all chemical use categories.

5. TUR Practices at Reporting Facilities

The 302 facilities (of 434) that said they found opportunities for toxics use reduction as the result of their 1994 plan were asked to what extent the TUR planning process had contributed to the adoption of certain TUR practices at their facility. The results are summarized in Table 9.

Table 9. Contribution of the TUR Planning Process to TUR Practices			
<i>TUR Practice</i>	<i>% responding* that planning process itself contributed to [practice]</i>		
	<i>To a great extent</i>	<i>Somewhat</i>	<i>Not at all</i>
Management attention to environmental practices	38%	50%	12%
Implementation of toxics use reduction	33%	56%	11%
Improvements in materials management	25%	55%	20%
Allocating environmental costs to processes or products	22%	54%	23%
* Total number of respondents = 302			

The majority of respondents indicated that the TUR planning process itself contributed in some way to TUR practice implementation at the facility. For each of the four categories of TUR activities, 76% to 89% of respondents indicated that the TUR planning process contributed either somewhat or to a great extent to the adoption of the TUR practice. While positive responses for all TUR practices were high, Management Attention to Environmental Practices and Implementation of Toxics Use Reduction were the most prevalent with 88% and 89% of respondents, respectively, saying that the TUR planning process contributed to implementing these practices in their facility. Four percent of respondents (13 of 302) said that the TUR planning process had not contributed to the adoption of *any* of these TUR practices.

Differences Among Respondent Groups

a. Facility Size

The smallest facilities reported slightly greater influence of TURA on two of the TUR practices than the largest facilities. For facilities with fewer than 50 employees, 43% (27 of 63) said that TUR planning contributed to a great extent to management attention to environmental practices, while 33% of facilities (12 of 36) with more than 500 employees said that it had contributed to a great extent.

At facilities with fewer than 50 employees, 30% (19 of 63) of facilities saw improvements in materials management as a result of the TUR planning process, whereas 19% (7 of 36) of facilities with more than 500 employees did. The results across all facility sizes are similar for the other two TUR practices.

b. Industry Type

Results were similar across industry sectors.

c. Chemical Use

The facilities with chemical use of less than 250,000 pounds reported that the TUR planning process itself contributed to allocating of environmental costs to products or processes (82%; 129 of 158) more frequently than other facilities (70%; 97 of 139). Results for all other TUR practices were similar across chemical categories.

6. Would Facilities Plan Voluntarily?

Eighty-six percent of all respondents (375 of 434 facilities) said that if the TUR planning requirement were removed, they would continue to conduct some type of TUR planning. Twelve percent (50 facilities) said that they would discontinue such plans and 2% (9 facilities) were unsure.

Facilities that had not implemented any projects identified in their 1994 TUR plan were more likely than other facilities to say they would not continue to plan if the requirements of the act were removed, as shown in Table 10. These facilities may not have seen benefits from TUR planning and project implementation, and therefore would not continue planning if not required to do so under the Toxics Use Reduction Act.

Table 10. Continue to Plan vs. TUR Project Implementation			
<i>Projects implemented that were identified in the 1994 plan</i>	<i>If the planning requirement were removed would you continue to plan?</i>		
	<i>Yes</i>	<i>No</i>	<i>Don't know</i>
All	92%	8%	0%
Most	90%	8%	2%
A Few	84%	12%	4%
None	56%	42%	2%

Differences Among Respondent Groups

a. Facility Size

Facility size had no effect on the willingness to continue planning.

b. Industry Type

There were only slight differences in willingness to plan voluntarily across industry types.

c. Chemical Use

The likelihood that a facility would continue to plan varied slightly among the different chemical use categories. Facilities with greater chemical use tend to be slightly less willing to continue TUR planning; while 91% (81 of 89) of the facilities that use up to 50,000 pounds of TURA chemicals said they would continue to plan, this figure drops slightly to 84% (72 of 86) for the facilities using over 1.2 million pounds per year.

D. Value of Available TURA Resources

Respondents were asked which TURA program resources they had used in their TUR activities, from Form S filing to project implementation. If a respondent had used a resource, they were then asked if it was very, somewhat, or not at all useful in the implementation of TUR at their facility.

Ninety-seven percent of respondents had used at least one TURA resource. Toxics Use Reduction conferences and workshops were the most commonly used TURA resource; 77% of respondents reported going to such conferences or workshops. Toxics Use Reduction Planner training (67%) and assistance from the Department of Environmental Protection (65%) were next in prevalence. Rounding out the list of utilized TURA resources were: toxics use reduction information from industry trade associations (54%), the Toxics Use Reduction Institute (TURI) information services or library (46%), and site visits from the Office of Technical Assistance (44%).

Toxics Use Reduction conferences and workshops were the most frequently utilized TURA resource for two potential reasons. First, TUR conferences and workshops are opportunities to accumulate continuing education credits TURPs need to maintain their certification. Consequently, TURPs are very likely to attend such events. Second, the conferences and workshops may offer specific guidance on a particular subject or industry. Non-TURPs may attend these conferences or workshops because they are a relatively low-cost way to obtain technical assistance information.

OTA site visits may not be utilized to the extent possible due to the time and effort required by facilities to prepare for, manage, and follow up on a visit from OTA staff. Some facilities may also be wary of inviting government officials into their facility, even though the information provided by OTA is confidential and kept from the Department of Environmental Protection. OTA visits were reported to be helpful by 86% of those facilities visited.

TURA resources were found to be “very” or “somewhat” useful in implementing toxics use reduction by almost all of the respondents that have had exposure to them, as shown in Table 11. Toxics Use Reduction Planner Training and site visits from the Office of Technical Assistance (OTA) were regarded as the most useful TURA resources. Forty-six percent of respondents using TURP training and 42% of respondents that received OTA site visits described them as “very useful” in the implementation of TUR at their facility.

Table 11. Opinion of TURA Program Resources

<i>Resource</i>	<i>How useful was [item] in helping your company implement TUR?</i>		
	<i>Very</i>	<i>Somewhat</i>	<i>Not at all</i>
Toxics Use Reduction Planner Training	46%	39%	13%
Site visits from the Office of Technical Assistance (OTA)	42%	44%	13%
Toxics Use Reduction conferences and workshops	38%	48%	14%
Assistance from the Department of Environmental Protection (DEP)	34%	53%	12%
Toxics Use Reduction Institute (TURI) information services or library	31%	53%	15%
Getting toxics use reduction information from industry trade associations	27%	65%	7%

Some respondents voiced specific concerns about the quality or availability of specific TURA resources. In response to the question, "What would you change about the TURA program?" the following resource-related comments were made by 24 facilities (others offered no changes):

- ▶ Change the certification or recertification process (4)
- ▶ Change the training, class, and exam (4)
- ▶ Offer alternative, nontoxic products (1), technologies (1), or general substitutes (3)
- ▶ Establish/continue long-range education plan (2)
- ▶ Establish better communication between government and industry (2)
- ▶ Expand Internet services (1)
- ▶ Set up a database with certification numbers (1)
- ▶ Do more with technology transfer (1)
- ▶ Have TURA employees be more available (1)
- ▶ Earlier follow-up by the agencies (1)
- ▶ Prompt notification of changes to TURA chemical list (1)
- ▶ Quicker response with exam results (1)

Differences Among Respondent Groups

Facilities' utilization and opinion of TURA resources were examined according to size of facilities, industry type, chemical use of facilities, number of TUR projects implemented, and consultant use.

a. Facility Size

Respondent facility size (measured by employee number) is associated with utilization of some TUR resources. The largest facilities (those with greater than 500 employees) were more likely to have site visits from OTA (57%, 25 of 44 facilities) than other facilities (42%, 164 of 389 facilities) and more likely to utilize TURI information services or library (61%, 27 of 44) than other facilities (44%, 171 of 389). Other resources were utilized relatively equally. Unlike utilization rates, opinion of TUR resources did not vary by facility size.

b. Industry Type

The utilization of TURA Program Resources was similar to the overall mean across industry sectors for all resources except site assistance from the Office of Technical Assistance. A greater percentage of Fabricated Metal Products (SIC 34), Textile Mill Products (SIC 22), and Paper and Allied Products (SIC 26) industries have experience with OTA technical assistance than other industries. Over one half of respondents, 58% (77 of 133) in each of these three industry types, said they had experience with OTA site assistance, compared to 38% (114 of 301) of respondents in other industries.

Facilities' opinions of TURP training, TUR conferences and workshops, and TURI information services and library vary by industry type. Industries' opinions of other TURA resources were similar to the overall average.

Toxics Use Reduction Planner Training

Sixty-four percent (14 of 22) of the Rubber and Miscellaneous Plastics Products (SIC 30) and 63% (19 of 30) of the Electrical and Electronic Equipment (SIC 36) industries responded that TURP training was "very useful." The percentage of other industry categories reporting "very useful" was 42% (100 of 240).

Toxics Use Reduction Conferences and Workshops

Most industries were similar in their opinions of this TURA resource. The lowest approval ratings were from the Primary Metals (SIC 33) and the Chemicals and Allied (SIC 28) products industries. Twenty-one percent of both (22 of 28, 45 of 57) indicated that TUR Conferences and Workshops were "not at all" useful, compared to 11% (27 of 249) of other industry sectors.

Toxics Use Reduction Institute (TURI) Information Services or Library

Most industries were similar to the overall average in their opinions of this resource. However, the Chemicals and Allied Products industry (SIC 28) was least likely of all industry groups to say that this resource was useful; 66% of this sector (21 of 32) indicated that the Toxics Use Reduction Institute (TURI) information services or library was very or somewhat useful, compared to 87% (146 of 167) for all other industry sectors.

c. Chemical Use

The utilization rates of TURA resources by respondents in different chemical use categories were close to the overall average.

Large chemical use facilities were more than twice as likely to report three TUR resources "not at all useful" than facilities using smaller amounts of chemicals, as shown in Table 12.

Table 12. Facility Chemical Use and Opinion of TURA Resources		
<i>TURA Resource</i>	<i>Percent of facilities responding that resource was "not at all" useful</i>	
	<i>Facilities using less than 250,000 pounds/year</i>	<i>Facilities using more than 250,000 pounds/year</i>
Toxics Use Reduction Planner Training	7% (10 of 145)	19% (27 of 142)
Toxics Use Reduction conferences and workshops	9% (14 of 164)	19% (31 of 162)
Toxics Use Reduction Institute (TURI) information services or library	10% (10 of 104)	21% (19 of 92)

Opinions of the other three resources (assistance from the Department of Environmental Protection (DEP), site visits from the Office of Technical Assistance (OTA), and toxics use reduction information from industry trade associations) were similar across chemical use categories.

d. Other Factors: Rate of TUR Project Implementation, Consultant Use

Regardless of whether facilities had implemented all, most, some, or none of the TUR projects selected for implementation in the 1994 plan, their rate of TURA resource utilization and approval ratings were similar.

Those facilities that used consultants to prepare "most" of their plan were half as likely to have experience with toxics use reduction planner training and toxics use reduction conferences and workshops than facilities that had no consultant involvement, as shown in Table 13. There was little to no difference between these respondent groups on experience with other TURA resources.

<i>Experience With</i>		<i>Proportion of TUR Plan Prepared by a Consultant*</i>		
		<i>None</i>	<i>Some</i>	<i>Most</i>
TUR Planner Training?	Yes	53% (156 of 292)	24% (70 of 292)	22% (65 of 292)
	No	26% (36 of 140)	26% (37 of 140)	44% (62 of 140)
TUR Conferences and Workshops?	Yes	50% (167 of 334)	26% (87 of 334)	23% (78 of 334)
	No	26% (26 of 99)	20% (20 of 99)	49% (49 of 99)

*Percentages may not add to 100% because refused and "Don't Know" responses are not presented

Consultant use had a slight effect on facility opinions of these resources. These facilities were less likely than others to think that toxics use reduction planner training and toxics use reduction conferences and workshops were very useful, as shown in Table 14. Consultant use had little to no effect on facility opinions of other TURA resources.

<i>% of facilities responding that:</i>	<i>No part of TUR Plan Prepared by Consultant</i>	<i>Some of TUR Plan Prepared by Consultant</i>	<i>Most of TUR Plan Prepared by Consultant</i>
TUR Planner Training was "very useful"	51% (80 of 156)	44% (31 of 70)	34% (22 of 65)
TUR Conferences and Workshops were "very useful"	43% (71 of 167)	36% (31 of 87)	32% (25 of 78)

These utilization and opinion differences reflect that the resources are likely to be used by an in-house TURP. By definition, facilities without in-house TURPs would be much less likely to have experienced TURP training. Facilities without TURPs may also be less likely to have attended TUR conferences and workshops because they may not be required to do so. TURPs are required to attend some of these conferences and workshops in order to maintain their certification. Because conferences and workshops are not as relevant to non-TURPs, these respondents were also more likely to find them less useful.

E. Is Toxics Use Reduction Good Business Practice?

The TURA goal "to sustain, safeguard and promote the competitive advantage of Massachusetts businesses, large and small, while advancing innovation in toxics use reduction and management" (TURA, MGL. c.21I) was examined in the phone and fax portions of the survey. The fax portion of the survey collected quantitative data on the benefits and costs of compliance with all parts of TURA. These quantitative results are presented in a companion report, *Benefit-Cost Analysis of the Massachusetts Toxics Use Reduction Act*. Qualitative assessments of TURA benefits from the phone survey are discussed below.

Data from two phone survey questions address the business competitiveness effects of TURA. The first provides context for discussion of TURA effects by determining the extent to which facilities are currently involved in TURA activities. The second explores whether implementation of TURA projects has resulted in specific qualitative benefits for respondent facilities. These questions are discussed below.

Facility involvement in TUR activities has increased substantially since the implementation of TURA requirements in 1990. Evidence of this trend is shown in Table 15.

Activity	Percentage of respondents "very involved" in [activity]**	
	Before 1990	Now
Tracking quantities of wastes generated	49%	89%
Tracking quantities of chemicals used	48%	90%
Reviewing changes in production processes for their environmental, health and safety impact	30%	76%
Establishing a corporate or facility environmental team	24%	68%
Setting goals for waste reduction	24%	73%
Allocating environmental costs to processes or products	21%	52%

*Total # of facilities = 434, Survey administered in June-July, 1996.
 **Note: only "very involved" responses shown.

The direct causality between passage of TURA and increased facility involvement in TUR activities cannot be proven without further study. Consequently, whether passage of TURA is the sole reason that facilities are much more involved in TUR activities now cannot be determined from the results of this question.

Facilities were asked if TUR project implementation had positive impacts on various components of business competitiveness. The results from this question are summarized in Table 16.

Table 16. Benefits from TUR Project Implementation			
<i>Benefit</i>	<i>% of Respondents that "actually saw" benefit to:*</i>		
	<i>A great extent</i>	<i>Somewhat</i>	<i>Not at all</i>
Cost savings	17%	50%	31%
Improved worker health and safety	21%	45%	31%
Reduced regulatory compliance requirements	11%	34%	52%
Improved environmental image	11%	27%	59%
Other benefit provided by respondent	15%	15%	-
Marketing advantage	7%	20%	72%

*Total facilities = 351, Rows may not add to 100% because refused and "Don't Know" responses are not presented

The most frequently reported benefits from implementing TUR projects were cost savings and worker health and safety. As a result of implementing their TUR projects, 67% (235 of 351) of respondent companies claimed they actually saw direct cost savings, for example, on materials use or waste disposal. Improved worker health and safety was the other major benefit of TUR implementation, a total of 66% (230 of 351) of respondents realized some improvements in this area. Worker health and safety improvements also create competitive advantage for a facility. Decreased worker sick days or accidents may improve facility productivity and decrease other potential costs (e.g., insurance premiums). Other competitive advantages were seen by a minority of respondents. Forty-five percent (158) saw reduced regulatory compliance requirements as the result of project implementation. Thirty-eight percent (133) indicated that they improved their environmental image, for example, in the surrounding community. Twenty-seven percent (95) of respondents realized marketing advantage, such as environmentally-friendly products, from TUR project implementation.

Questions concerning the benefits of TUR projects were not asked to the 83 respondents that did not implement projects as a result of their 1994 TUR plan.

"Other" responses

Approximately 30% of facilities (105 of 351) provided an additional benefit, which they had seen to a great extent (51%) or somewhat (48%). Of these additional responses, 58% (61 facilities) mentioned management or employee awareness of TUR-related issues. The additional benefits

are summarized in Table 17.

Table 17. Other Benefits Provided by Respondents from Implementing TUR Projects	
<i>Benefit</i>	<i>Number of Respondents that "actually saw" benefit*</i>
Improved management or employee awareness of TUR-related issues	61
Reduced emissions	14
Improved materials accounting	12
Improved product quality	8
Beneficial effects on suppliers or customers	5
Other benefits	5
*Total number of facilities = 105	

A small proportion of facilities implemented projects but saw no benefits.

Nine percent (31 of 351) of facilities implementing projects indicated that no benefits were seen at all. The two primary industries in this group were the Chemicals and Allied Products (SIC 28) (32%, 10 of 31) and Fabricated Metal Products (SIC 34) (23%, 7 of 31) industries.

Differences among Respondent Groups

Facilities of different sizes, chemical use amounts, and industry types were examined for differences in benefits from project implementation.

a. Facility Size

As shown in Table 18, small facilities were less likely than large facilities to see cost savings as the result of implementing TUR projects. Other benefit categories did not vary by facility size.

Table 18. Frequency of Cost Savings, According to Facility Size	
<i>Facility size</i>	<i>Percent Answering: Cost Savings Not Seen at All</i>
≤50 employees	41% (33 of 81)
>50 employees	28% (76 of 270)

b. Industry Types

Some industries benefit more than others from implementation of TUR projects. The

differences among various industry sectors are explored below, by type of benefit.

Cost Savings

The Rubber and Miscellaneous Plastics Products (SIC 30), Electrical and Electronic Equipment (SIC 36), and Fabricated Metal Products (SIC 34) industries were more likely than other respondents to see cost savings "to a great extent," as shown in Table 19.

<i>Industry</i>	<i>To What Extent Did Your Company Actually See Cost Savings...</i>			<i>Number of Facilities*</i>
	<i>A Great Extent</i>	<i>Somewhat</i>	<i>Not At All</i>	
Rubber and Miscellaneous Plastics Products (SIC 30)	29%	43%	25%	28
Electrical and Electronic Equipment (SIC 36)	28%	58%	14%	36
Fabricated Metal Products (SIC 34)	23%	52%	23%	71
All Other Industries	12%	49%	38%	216

*Total number of facilities = 351

Improved Worker Health and Safety

All industries had similar distributions of responses for this question.

Marketing Advantage, Such as Environmentally Friendly Products

The Paper and Allied Products industry (SIC 26) was distinguished by having the highest percentage (16%, 4 of 25) of "a great extent" responses to this question. All other industries saw marketing advantage to "a great extent" 7% of the time (22 of 326).

Improved environmental image, for example, in the surrounding community

The Electrical and Electronic Equipment (SIC 36) and Paper and Allied Products (SIC 26) industries were most likely to say that TURA projects improved their environmental image. Fifty-two percent (32 of 61) of facilities in these industries said TURA actually improved their environmental image somewhat or a great extent. All other industries averaged 34% (99 of 290).

Reduced Regulatory Compliance Requirements

The Rubber and Miscellaneous Plastics Products (SIC 30) and the Primary Metal (SIC 33) industries saw reduced regulatory compliance requirements most frequently as the result of TURA projects (57%, 30 of 53). Forty-three percent (128 of 298) of other

facilities reported this benefit.

c. Chemical use

Facilities in the lowest chemical use category were most likely to see an improvement in environmental image, as shown in Table 20.

Table 20. Improved Environmental Image From TURA vs. Facility Chemical Use Category			
<i>Facility Chemical Use (Lbs/year)</i>	<i>Percent of facilities that "actually [saw] improved environmental image, for example in the surrounding community," as a result of implementing the TUR projects:</i>		
	<i>To a great extent or somewhat</i>	<i>Not at all</i>	<i>Number of facilities</i>
0 - 50,000	48%	51%	73
50,001 - 250,000	39%	57%	112
250,001 - 1.2 Million	34%	65%	92
>1.2 Million	34%	59%	68

F. Program Modification Suggestions

The answers to the question, "What would you change about the TURA program" were recorded verbatim by interviewers and grouped into categories. Respondents offered a wide range of suggestions for improving TURA. At the extremes, 12% recommended eliminating the program while 14% recommended leaving it unchanged. The full text of all responses are presented in Appendix A and summarized in Table 21.

Table 21. What would you change about the TURA program?***

<i>Open-ended responses</i>	<i>Percent of facilities*</i>	<i>Number of facilities*</i>
Reduce paperwork burden/Simplify process	19%	66
Change toxics list (e.g., make Form S=Form R, exclude chemical manufacturers, exclude metals use)	16%	53
Reduce/Remove/Restructure fees	14%	48
Nothing	14%	47
Eliminate it	12%	40
Change reporting threshold/Too difficult for small businesses	6%	20
Other**	40%	136

*Percentages do not add to 100 because facilities provided more than one response. **Total facilities = 340.**

** See Appendix A for text of all open-end responses.

Many of the changes suggested by respondents addressed the issue of the time and expense of meeting specific TURA requirements. Thirty-nine percent of facilities responding to this question (134 of 340) indicated that TURA compliance could be a paperwork burden, was complex, carried heavy fees, or was particularly difficult for small businesses. A few facilities specifically reported that TURA requirements hindered business competitiveness by diverting time and financial resources away from other more productive uses.

Some facilities requested that their particular chemicals, products, or industry sectors be delisted due to a lack of toxics use reduction opportunities. These sectors (and the number of facilities that suggested them) included:

- ▶ distributors and wholesalers (3),
- ▶ manufacturers with no room for improvement (2), and
- ▶ food industry (1).

The most frequently mentioned product was metals. Six facilities requested TURA exemptions for manufacture of metals products (including stainless steel).⁶

⁶Two changes have already been made by the TURA program to ease the burden on stainless steel and other metal manufacturers. First, DEP has broadened the “article” exemption under EPCRA to exempt the use of copper, copper alloys, and any constituent of steel or stainless steel from full TURA reporting, planning, and fee paying requirements as long as several conditions are met (see BWP 94-014). Second, as of 1995, copper, nickel, chromium, cobalt, and manganese in a solid or molten metal alloy were delisted and are no longer reported under TURA.

Some responses could not be grouped into categories that were specific enough to accurately convey their meaning. However, the suggestions in the "other" category can be grouped under three general subheadings: flexibility, definition of terms, and administration. Some examples of each are presented below.

Flexibility

- ▶ Have the program be more flexible; allow exemptions (14 responses)
- ▶ Recognize that some toxic chemicals have no alternatives for certain uses (9)
- ▶ Address industry-specific or company-specific concerns (8)
- ▶ Make the program voluntary (4)
- ▶ Recognize that some industries or facilities can only improve so much before reaching a plateau (2)

Definition of Terms

- ▶ Change/clarify the definition of "unit of product" (5)
- ▶ Change/clarify the definition of "by-product" (5)
- ▶ Change/clarify/expand the definition of "recycling" (2)

Administration

- ▶ Electronic filing of the TURA program (4)
- ▶ Offer alternative nontoxic products (1), technologies (1), or substitutes (3)
- ▶ Eliminate certification or certified planner (5)
- ▶ Establish better communication between government and industry (2)
- ▶ Devise toxicity rating system, or method that recognizes relative toxicity (2)
- ▶ Make reporting required annually (1), every three years (2), every five years (2)

Overall, although some facilities chose to make extreme statements, most offered some specific suggestions for improving TURA. A review of these suggestions in Appendix A will help guide program improvements.

IV. SURVEY TEXT AND RESULTS

The following chapter contains the script of the telephone interview and the responses for each question. Text in ALL CAPITALS were instructions to the interviewer and were not read to respondents. The response code DK means, "don't know," and REF means, "refused to answer". When comparing these percentage responses, note the total number of facilities responding to the question. DK responses are not presented for multi-part questions.

-TURA PROGRAM EVALUATION SURVEY-

ASK TO SPEAK WITH PERSON NAMED IN SAMPLE.

IF SAMPLE DOES NOT HAVE A NAME, ASK TO SPEAK WITH THE PERSON WHO KNOWS THE MOST ABOUT THE COMPANY'S TOXIC USE REDUCTION ACTIVITIES.

INTRODUCTION

Hello, my name is _____ I am calling from Abt Associates, a research firm in Cambridge, on behalf of the Massachusetts Toxics Use Reduction Program. We are conducting a short telephone survey to find out how the Massachusetts Toxics Use Reduction program is working and how it could be made more effective. As a facility with experience with the Toxics Use Reduction Act, or TURA, your input is very valuable.

- 1.1 Just to confirm that we're talking to the right person:
ASK 1.2 IF SAMPLE HAS NAME
SKIP TO 1.3 IF THERE IS NO NAME IN SAMPLE

- 1.2. Our records indicate you are a (Toxics Use Reduction Planner/Toxics Release Inventory Technical Contact/Form S senior management signatory). Is that correct?

YES - TOXICS USE REDUCTION PLANNER, TECHNICAL CONTACT, OR
FORM S SIGNER 100%
NO -

Total number of facilities responding: 434

1.3 Are you an employee, NOT a consultant, for [company name] in [city name] who knows the most about the company's toxics use reduction activities at this location?

YES -
NO (ASK FOR NAME AND PHONE NUMBER OF APPROPRIATE
PERSON, RECORD AND ASK TO BE TRANSFERRED. WHEN
CONNECTED, READ INTRODUCTION. -

Total number of facilities responding: 434

2.1 OK. I'd like to assure you that participation in this study is voluntary and your answers will be kept strictly confidential. Please be aware that I am not a TURA expert and so will not be able to answer any questions you may have about your responsibilities under the Act.

Is your facility required to report to TURA for 1995?

YES (SKIP TO Q.2.4) 87.3%
NO 10.4%
DK (SKIP TO Q.2.4) 2.3%
REF (SKIP TO Q.2.4) -

Total number of facilities responding: 434

2.2 What changed in your business so that you were not required to report in 1995?

DON'T MEET THE REPORTING THRESHOLD
ANY LONGER 71.1%
GOING OUT OF BUSINESS (SKIP TO 2.4) -
CHEMICAL WAS DELISTED (SKIP TO 2.4) 26.7%
OTHER (SPECIFY) (SKIP TO 2.4) -
DK (SKIP TO Q.2.4) 2.2%
REF (SKIP TO Q.2.4) -

Total number of facilities responding: 45

2.3 What changed your status? READ CATEGORIES, IF NEEDED.

TOXICS USE REDUCTION, OR T.U.R., IMPLEMENTATION 76.0%
CHANGE IN PRODUCT -
CHANGE IN PRODUCTION PROCESS 12.0%
DK (SKIP TO Q.2.4) 8%
REF (SKIP TO Q.2.4) -
OTHER 4%

Total number of facilities responding: 25

2.4 Now I'd like to ask whether your company was involved in the following activities before and after implementation of the Toxics Use Reduction Act **in 1990**.

- A. **Before 1990**, was your company very involved, somewhat involved or not involved in (READ ITEM)?
- B. How involved is your company **now**? (Very involved, somewhat involved, or not involved at all)? (MARK IF DON'T KNOW)

ITEM	A. BEFORE 1990			B. NOW		
	Very involved	Some-what involved	Not involved	Very involved	Some-what involved	Not involved
Tracking quantities of wastes generated	49.1%	30.4%	10.8%	88.7%	9.0%	1.6%
Tracking quantities of chemicals used	47.7%	34.6%	8.5%	89.9%	8.5%	0.9%
Establishing a corporate or facility environmental team	23.7%	37.3%	29.0%	67.7%	24.9%	5.3%
Setting goals for waste reduction	24.4%	37.8%	27.6%	72.6%	21.9%	4.4%
Reviewing changes in production processes for their environmental, health and safety impact	29.7%	39.6%	18.9%	76.3%	20.0%	2.3%
Allocating environmental costs to processes or products	21.0%	32.0%	32.9%	52.1%	36.2%	7.8%
	Number of facilities responding: 434			Number of facilities responding: 434		

Now I'd like to ask you about the extent to which TURA has been effective in reducing toxics use or byproduct production at your facility.

3.1 Since 1990, has your facility's **net** use of toxic chemicals **per unit of total production**

Increased	9.7%
Decreased	59.9%
Remained unchanged	22.4%
DK	7.6%
REF	0.5%

Total number of facilities responding: 434

(IF ASKED MEASURE IS FOR WHOLE FACILITY, NOT A PARTICULAR PRODUCTION LINE)

3.2 Since 1990, has your facility's **net** byproduct generation **per unit of total production** increased, decreased or remained unchanged?

Increased	7.4%
Decreased, or	54.8%
Remained unchanged	27.9%
DK	9.7%
REF	0.2%

Total number of facilities responding: 434

(IF ASKED MEASURE IS FOR WHOLE FACILITY, NOT A PARTICULAR PRODUCTION LINE)

Now, I have some questions about the TUR process itself starting with your **TUR Plan**.

4.1 Did you identify any opportunities for toxics use reduction **as the result of your 1994 TUR Plan?**

YES	69.6%
NO (SKIP TO 4.3)	25.1%
DK	5.3%
REF	-

Total number of facilities responding: 434

4.2 To what extent did the T.U.R. planning process itself contribute to the following- to a great extent, somewhat, or not at all?

EXTENT	WHAT	AT ALL	GREAT	SOME-	NOT
	Management attention	to environmental practices?	38.4%	49.3%	12.3%
	Improvements in materials management?		24.5%	55.3%	19.5%
	Allocating environmental costs to processes or products?		22.2%	54.0%	22.8%
	Implementation of toxics use reduction		33.1%	55.6%	10.9%

Total number of facilities responding: 302

4.3 If the planning requirement were removed, would your facility continue to plan?

Yes	86.4%
No	11.5%
DK	2.1%
REF	-

Total number of facilities responding: 434

4.4 Now, which of the following parts of the T.U.R. planning process is **most** valuable to your company and which is **least** valuable? The parts of the planning process are:

RECORD **ONE ANSWER** for each.

	<u>MOST</u>	<u>LEAST</u>
materials accounting (IF NECESSARY, PROMPT... "OF TOXIC CHEMICAL USE AND BY-PRODUCT GENERATION")	30.2%	12.2%
cost of toxics calculation	10.6%	23.3%
development of T.U.R. options	21.7%	9.9%
financial evaluation of T.U.R. options	9.4%	17.7%
developing by-product reduction goals	16.4%	24.2%

Total number of facilities reporting (for each): 434

4.5 When you filled out your Form S, did you request trade secret protection?

YES (SKIP TO 4.7)	8.1%
NO	85.9%
DK	6.0%
REF	-

Total number of facilities responding: 434

4.6 Why not? Was it...

Not relevant	91.7%
Too much paperwork	5.4%
Some other reason (SPECIFY)	1.3%
DK	1.6%
REF	-

Total number of facilities responding: 373

4.7 How many of the T.U.R. projects that you selected for implementation in your 1994 plan have, or will be, fully implemented? Would you say...

All	25.6%
Most	28.6%
A few	26.7%
None (SKIP TO 4.10)	9.4%
DON'T KNOW	9.4%
REF	0.2%

Total number of facilities responding: 434

4.8 As a result of implementing the T.U.R. projects, to what extent did your company actually see (READ ITEM) Would you say to a great extent, somewhat, or not at all?

	GREAT EXTENT	SOME- WHAT	NOT AT ALL
a) Cost savings, for example, on materials use or waste disposal	17.1%	49.9%	31.1%
b) Improved worker health and safety	20.8%	44.7%	31.3%
c) Marketing advantage, such as environmentally friendly products	7.4%	19.7%	71.5%
d) Improved environmental image, for example in the surrounding community	10.8%	27.1%	59.0%
e) Reduced regulatory compliance requirements	11.4%	33.6%	52.4%

Total number of facilities answering (a) through (e): 351

f) Was there some other benefit from implementing T.U.R. projects? (SPECIFY) _____	47.7%	50.5%
---	-------	-------

Of facilities providing other benefits in f)
 Management awareness/involvement: 10.8%
 Employee awareness/involvement: 6.6%

Total number of facilities answering (f) and "Other": 107

4.9 IF MORE THAN ONE POSITIVE RESPONSE TO 4.8, ASK:
Which benefit was most valuable to your company? CIRCLE LETTER FROM LIST IN Q. 4.8.

a	b	c	d	e	f
32.0%	29.4%	3.1%	4.6%	8.8%	13.3%

Total number of facilities responding: 194

4.10 IF 4.7 = 1 (ALL), SKIP TO Q. 4.12.
You indicated that not all the T.U.R. projects that were selected for implementation in your 1994 plan were actually implemented. How important were each of the following factors in your company's decisions **not** to implement T.U.R. projects? Was (READ ITEM) very important, somewhat important, or not important at all to your company's decision not to implement a T.U.R. project.

	VERY IMPORTANT	SOMEWHAT	NOT AT ALL
a) Capital not readily available	26.3%	25.6%	46.3%
b) Customers not accepting change in the product	31.0%	13.9%	50.9%
c) Company concern with impact on product quality	50.9%	19.6%	27.0%
d) Lack of management support for changes	8.9%	19.6%	66.2%

Total number of facilities responding: 281

4.11 IF MORE THAN ONE POSITIVE RESPONSE, ASK:
Which factor was most important? CIRCLE LETTER FROM LIST IN Q.4.10

a	b	c	d
21.1%	31.7%	34.1%	4.9%

Total number of facilities responding: 123

4.12 The next question applies to all phases of your toxics use reduction activities, in other words, from Form S to project implementation.

We are interested in the extent to which your facility used the **program resources** available under the Toxics Use Reduction Act.

A: Do you have experience with (ITEM)...YES/NO?

IF YES, ASK B:

B: How useful (were they/was it) in helping your company implement T.U.R.? Would you say very useful, somewhat useful, or not useful at all?

ITEM	A. Experience?		B. Useful?			
	Yes	No	Very	Some-what	Not at all	Number of facilities responding
Toxics Use Reduction Planner Training	67.3%	32.3%	45.5%	39.0%	13.0%	292
Toxics Use Reduction conferences and workshops	77.0%	22.8%	38.8%	48.2%	13.5%	334
Assistance from the Department of Environmental Protection (DEP)	64.5%	35.3%	33.6%	52.9%	12.1%	280
Site visits from the Office of Technical Assistance (OTA)	43.8%	56.0%	42.1%	44.2%	12.6%	190
Getting Toxics Use Reduction information from industry trade associations	53.7%	45.2%	27%	65.2%	6.9%	233
Toxics Use Reduction Institute (TURJ) information services or library	53.0%	45.9%	31.2%	52.8%	15.1%	199
	Facilities responding: 434					

5.1 What would you change about the TURA program?

5.1 What would you change about the TURA program? Open-ended responses, by category	
<i>Open-ended responses</i>	<i>Percent of facilities responding*</i>
Reduce paperwork burden/Simplify process	19%
Change toxics list (e.g., make Form S=Form R, exclude chemical manufacturers, exclude metals use)	16%
Reduce/Remove/Restructure fees	14%
Nothing	14%
Eliminate it	12%
Change reporting threshold/Too difficult for small businesses	6%
Other**	40%
*Percentages do not add to 100 as facilities may respond more than once. Total facilities = 340. ** See Appendix A for text of all open-end responses, including "Other"	

Now I have a few questions about this facility for background information.

6.1 How would you characterize your company? Is it a....

Single location company	56.9%
Multi-location company	21.7%
Multinational company	21.4%
DON'T KNOW	-
REF	-

Total number of facilities responding: 434

6.2 What is the approximate number of employees at this location?

READ CATEGORIES IF NECESSARY.

1-9	0.7%
10-49	24.9%
50-99	22.6%
100-499	41.5%
500 or more	10.1%
DON'T KNOW	-
REF	-

Total number of facilities responding: 434

6.3 Which of the following best describes your job title?

facility or plant manger	15.7%
environmental health and safety specialist	47.9%
production engineer	12.7%
corporate executive	20.5%
OTHER	1.6%
DON'T KNOW	-
REF	-

Total number of facilities responding: 434

6.4 To what extent did you use a consultant to help you with your T.U.R. Plan? Would you say...

you did not use a consultant	44.5%
you had some help from a consultant	24.7%
a consultant prepared most of the plan	29.5%
DON'T KNOW	1.4%
REF	-

Total number of facilities responding: 434

7.1 Lastly, we are collecting some cost information to evaluate the costs and benefits of the TURA program. To do an accurate analysis, your input is essential and we appreciate your help. The information we need has been condensed into a short fax to make it easier to respond. Can I please have a fax number where I can send it to you? You may then fax your responses at any time before the end of next week.

YES, HAS FAX	96.8%
YES, MAIL	-
REFUSED	3.2%

Total number of facilities responding to this question: 434

CLOSING: Thank you very much for your time. We really appreciate your cooperation and look forward to receiving your fax.

Appendix A: Open-ended responses to “What would you change about the TURA program?”

340 facilities responded with 410 replies.

The numerical codes:

1 = Eliminate the program.

2 = Nothing.

3 = Reduce the paperwork burden; simplify the process.

4 = Reduce/Remove/restructure the fees.

5 = Change the toxics list (e.g., make Form S consistent with Form R, exclude chemical, etc.)

6 = Change the reporting threshold; the program is burdensome and difficult for small business.

0 = Other.

Summary:

Numerical code of response	1	2	3	4	5	6	0
Number of facilities responding	40	47	66	48	53	20	136

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

Code	Response
1	Besides eliminating it?! I can't think of anything offhand.
1	I would eliminate it. It does not go beyond what the Form S requires. It is a duplication of work.
1	Get rid of it. No fees. Shouldn't have to file every year. If you've reached the goal, then you shouldn't have to report yearly or pay fees.
1	I would eliminate it. It is unrealistic. It appears to be put in place to justify a new program at a university at lowell. The 30-hour requirement is ridiculous for what is offered- so is planning certification as well as the outside consultants. It is a waste of small companies' resources.
1	Get rid of the plan. Match chemicals with feds (they're killing us).
1	Eliminate it.
1	Eliminate TURA plan. Stress fining instead.
1	I'm not sure if it includes the Form S, but I think we should just have to comply with federal EPA guidelines, and that's it.
1	It should be voluntary, because it makes sense but it's so much paperwork to do.
1	Whole thing scrapped and redone, restructuring guidelines and classes.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
1	Discontinue TURA. Reduce fees. Change compliance requirements.
1	Eliminate it. Any of the toxics use reduction we did, we were going to do it any way for cost efficiency.
1	Repeal it to save jobs, because the benefits it has produced to the damage it has done to the job opportunities to the employees and customers' employees.
1	I would delete it. There are other more cost efficient ways for businesses to reduce chemicals than TURA.
1	The training. Get rid of the institute.
1	Remove it. These programs should be run by federal not state. There are enough federal programs, it makes it hard to compete with companies nationwide when you are limited differently by the states.
1	I would get rid of it. It is useless to our industry where we don't have control over the toxics. We are a chemical distributor.
1	I would eliminate it. It is so plainly a revenue-raising tool. It is a department with no scientific merit. It is run by non-scientists and is being run without regard to science, environment, or health and safety.
1	I would eliminate it. It duplicates what the federal agency is doing. It seems like another way to tax industry.
1	Get rid of mandatory planning. Eliminate fees. Substitute whole law with pollution prevention law that is more industry-friendly. The company doesn't need TURA. Volunteer basis is significant. Change the regulations to agree with the law. Don't allow the regulations to add to what's law.
1	Who would have to comply. A company who distributes chemicals has no need to comply with TURA. We don't use them; we just distribute them. The program is no use to me--it doesn't help me. It is just paperwork and a check I have to send.
1	Vote for repeal of act. Substitute a pollution prevention act. Eliminate TURI.
1	Eliminate it. There's no need for it anymore.
1	I would eliminate it. I think it is redundant with the EPA.
1	Drop it.
1	I'd eliminate it. I think there is too much time spent for too little return. I think it's too time consuming and repetitive. It's really not necessary, especially for small businesses.
1	Eliminate it.
1	Change the name to toxics use management. Get rid of the program.
1	I would repeal it.
1	Get rid of it. Think it is good, but our industry does not have opportunity for great reduction.
1	Waste of time. Hidden state tax/fee goes to general fund. The chemicals which we use cannot be substituted (pH acid/base). Duplicative of SARA program.
1	I would eliminate it, or at least eliminate the cost for the manufacturer. It is very costly when you have to use a consultant in a small shop.
1	I would eliminate it. They have substantially increased our cost of working in Massachusetts and increased our bureaucratic burden.
1	I would like to change from something that has to be done as an incentive as oppose to requirement.
1	Do away with it.
1	Make it go away. Too much paperwork.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
1	The whole method of reporting. The hours spent trying to straighten the forms out is ridiculous. If we could just report the amount of chemicals. A small company can't afford the man-hours. Eliminate the program.
1	I would eliminate it. It is proven useless and burdensome.
1	I would eliminate it. I don't think it serves a purpose.
1	Eliminate it.
2	Nothing.
2	I'd like to see chemical use reduction in every industry, speaking as an individual.
2	Can't say anything.
2	I think it's pretty all-inclusive. The name of the game is to reduce the amounts of toxics used. It's going along pretty well.
2	Nothing.
2	Would not change anything.
2	No problem with it, because they deal with copper. It's not really applicable
2	None.
2	It's good program; nothing.
2	Nothing.
2	No changes. We don't generate waste. We don't fit the niche well; we consume/we do not produce by-products.
2	Nothing
2	Nothing.
2	Pretty happy with how it worked. Have nothing to change.
2	Nothing.
2	I think it's important to the environment and the people in the commonwealth, and as a responsible company, we find it important to reduce toxic chemical use.
2	Nothing.
2	It's fine.
2	Nothing.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
3	Change some of the ridness about the plan, what goes into the plan. Making it more effective. Too much time with paperwork vs. actually implementing plan for reduction. Too narrow a definition of toxic reduction. Should also reduce utilities. Format is somewhat laborious to complete.
3	Way too much paperwork. The terms are very confusing, hard for people in general to understand what we report.
3	Easier paperwork. On a computer disc for electronic filing.
3	The Form S itself, it can get confusing. Some clarification in certain areas of the regulation (wn?) like definition of by-product, etc.
3	List of chemicals way too long. Forms are different, too long, and very difficult and very confusing. List of chemicals different from federal. No one utilizing information for the betterment of environment. Not possible to be involved and stay out trouble without hiring a consultant.
3	The cost. It is a little too detailed, in depth.
3	Simplified. Too time-consuming for small companies where there are many different projects.
3	Fees are quite stiff--costs a lot of money. Reduce the cost program. Reduce the paperwork requirements--quite an extensive thing. Reduce time spent on paperwork.
3	It should be voluntary, because it makes sense but it's so much paperwork to do.
3	Simplify cost calculations. Allow us to figure that out for ourselves.
3	The amount of work required is too much work and money. Make it simpler.
3	Simplify paperwork and process for small companies.
3	Too much paper which does not add value. Brings everyone down to the lowest level.
3	Hard to understand forms to fill out. It is a big task for us to determine what information is needed. Only one of our raw materials is in the program.
3	Paperwork burden; too much work. Government can tell you how to run your business.
3	Decrease paperwork.
3	I would like to see the Form S and the TURA program incorporated into one. I think it would simplify everything, especially paper work.
3	Most of it, the emphasis should be the reduction of chemicals used, not complete stoppage. Too much paperwork. Company doing well.
3	Simplify calculation of by-product reduction, simplify Form S.
3	Reduce paperwork. Make it appear that we have to do something.
3	Reporting complex and record keeping.
3	Too complex for our facility. With less toxics, set cut-offs to lower limit or thresholds.
3	The compilation of the study at the end is a lot of work, like a paperwork exercise.
3	The redundancy of some of the reporting work. The benefit of TURA was changing the way business looks at environment, but there's too much paperwork.
3	Reduce paperwork.
3	The language.
3	Simplify things. Go after big problems first.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
3	Reducing paperwork. Getting information should be proprietary.
3	As a company that uses a fairly large number of chemicals as raw product and has a low volume of by-product, I had to go through a lot of planning exercises for very little benefit. For example, we use a lot of chromium compounds in our liquid acid blends, but because of the way TURA is, measurable releases to the air and water are less than a pound per year. I have to go through a lot of paperwork for nothing, and I'm not about to give our customers a weaker product. I find the TURA process rather frustrating. I do not see ease of toxic use in the business of making toxic chemicals as defined by the TURA program.
3	Better paperwork, better written.
3	Less complicated paperwork.
3	I'm not sure the program itself is needed. Chemical companies should just use less toxic chemicals in general, but the small business community should be forced to comply with separate state and federal regulations that are different for different materials. It's a real paperwork nightmare, a bureaucratic mess.
3	I would gear it more towards small business, and make it more understandable. I had to hire someone to make sense of it for me and fill out the forms.
3	Make it easier to write a program.
3	I would eliminate a lot of the paperwork and calculations. Figures should be submitted, but the state should do the evaluation. It would be more meaningful.
3	Majority of paperwork--it's very costly. Do not see purpose of Form S when there is Form R, but only written differently.
3	Less complicated paperwork.
3	Some confusion of forms and what they ask you for. Go from one office to another without real answers. Program much better now than at the beginning.
3	I'd overhaul it. We did all the work TURA asks us to do before TURA was implemented, so it's just a bunch of extra paperwork. Revise Form S to be more like the EPA's Form R. Change reporting requirement time limits from two years to five years.
3	I'd eliminate it. I think there is too much time spent for too little return. I think it's too time consuming and repetitive. It's really not necessary, especially for small businesses.
3	Reduce the length of the TURA process. It's very time consuming. Also, the reporting cost.
3	They don't track with SARA for federal. They don't have the same regulations, and it is hard to know when we have to file and don't have to and for whom.
3	It is very involved and we have to hire a consultant. It could be simplified.
3	Simplify paperwork.
3	Try to make material balances and cost accounting simplified and streamlined.
3	It seems to be heavily slanted toward paperwork.
3	Make simplified reporting.
3	The publishers of TURA, when they update the concrete boiler plate. (???) Make a format that would eliminate fluff. Get right to the numbers--it would save time in doing updates and make it easier to read.
3	Some of the reporting contracts are confusing.
3	I would streamline it extremely, and I'd include it with federal reporting requirements. I think companies that want to stay competitive) would do it anyway.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
3	Get rid of paper-pushing. Certain manufacturing fields are such that only so much can be done. Year after year of TURA reporting is not productive when so little can be improved. We are still burdened by the reporting requirements.
3	Less paperwork.
3	The companies I deal with would have to have enough quantity generated to make them worth dealing with. So TURA wouldn't be hassling small companies. Be more concerned about goals and results than tracking paperwork.
3	Make it go away. Too much paperwork.
3	The complexity of the report. It is very time consuming.
3	The whole method of reporting. The hours spent trying to straighten the forms out is ridiculous. If we could just report the amount of chemicals. A small company can't afford the man-hours. Eliminate the program.
3	Reduce paperwork if possible.
3	Same chemicals as the federal government. Less paperwork.
3	Too much paperwork. More credit given for recycling of material not integral to the process.
3	Plan too in-depth and should simpler. Let us decide on the details. Otherwise, the plan process is good.
3	Try to change the paperwork aspect. Reduce the amount of time it takes to complete the forms. I also think that the state forms and federal forms overlap quite a bit.
4	We like the voluntary requirement aspect. Do more with the technology transfer. The fees are a little pricey.
4	Lower the fees.
4	The fees. Greater flexibility for different companies. Being a recycling plant, we don't have much flexibility.
4	Reduction in fees.
4	I wouldn't require certification of turps or planners, and reduce the fees.
4	Would eliminate bri and eri from production unit. Use only bri and eri from facility-wide. Continue process characterizations by production unit. Reduce the price.
4	Get rid of it. No fees. Shouldn't have to file every year. If you've reached the goal, then you shouldn't have to report yearly or pay fees.
4	Cost to be certified as a TURA planner.
4	Change the frequency--every two years is aggressive. I would make it every 5 years. Reduce the fees for the annual report.
4	I would not charge the \$9000. The TURA program is very expensive.
4	Cost structure.
4	Would change the number of hours the planner has to accumulate within given time. Small firm has to spend same number of hours, spend a lot of time getting things delisted. Very irate about list of things that are listed but not really toxic. Only company to get certain chemicals get delisted. Fees are unfair, disproportionate for small firms. Whopping fees--it's unfair.
4	The cost. It is a little too detailed, in depth.
4	Cost

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
4	I don't like the fact that you need to have a certified planner sign the plan. I'd remove that. I also think that the fees are a little high. I do like the fact that numbers are normalized to production units.
4	The cost. The high base cost. Give a chance to get some of the cost back through grants. Delist the same chemicals as the federal programs. I would like to see some consistency between state and federal.
4	Fees are quite stiff--costs a lot of money. Reduce the cost program. Reduce the paperwork requirements--quite an extensive thing. Reduce time spent on paperwork.
4	Discontinue TURA. Reduce fees. Change compliance requirements.
4	I would not make us pay the high fee. We should have some kind of incentive.
4	Restructure fees; structure so that states do not collect fee. Instead, have 'fee' go directly to reduction. Do not eliminate fee. Just have the amount directly used by firms.
4	Fees are too high and keep having to pay fees. Lower them!
4	The fees are way too high. The processes should be reviewed---some people just can't reduce their usage and have to pay for it. They should look at effects on other programs like air quality. For example, in order for Company R to improve air quality emissions, Company R has to use more TURA chemicals.
4	Reduce fees for general practice terps. Change the plan summary sheet.
4	Reduce fees. Publish what data is available in the library, so we do not have to search.
4	The cost.
4	Lower the fees. The state has an established goal of 50% by-product reduction a few years down the road, and I don't see how that is possible. I would figure out how I wanted the companies to do so prior to requiring it.
4	Get rid of mandatory planning. Eliminate fees. Substitute whole law with pollution prevention law that is more industry-friendly. The company doesn't need TURA. Volunteer basis is significant. Change the regulations to agree with the law. Don't allow the regulations to add to what's law.
4	Eliminate planning, reporting, and fees associated with combustion by-products, because it is duplicative with the Clean Air Act. Difficult to quantify amount of by-products going up the stack. Information created from planning/reporting of combustion by-products serves no useful purpose under intent of TURA.
4	I would eliminate the TURA summary plans every other year. The plan summaries tend to get a bit expensive. Some cost reduction is needed. It's just a headache for small companies, where everyone wears many hats. I think the general public will make TURA happen without the state's involvement.
4	The check we have to send in. Some of the reporting requirements. Review and change, in some cases, some of the limits.
4	Eliminate the fees. Program keeps people honest.
4	Reducing the fees, as well as delisting more metals.
4	Make exceptions for certain companies. Change the fees.
4	The fee structure, flat fee. Need incentive when showing reduction, e.g., credit or reduced fees for favorable reduction. Take out the accounting portion--it is no one's business.
4	Reduce the length of the TURA process. It's very time consuming. Also, the reporting cost.
4	I would throw out the fees. They are too expensive.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
4	It seems to be more focused on decreasing by-products rather than having actual toxics decreased. We're involved in chemically converting toxic chemicals in a reaction process, so the TURA program is in many ways not applicable to us. I would lower the fees on toxic chemicals use.
4	The fee structure is excessive.
4	By-product reduction index. Long-term projections. Fee system.
4	I would eliminate it, or at least eliminate the cost for the manufacturer. It is very costly when you have to use a consultant in a small shop.
4	The fees. I'd lower them.
4	It is not doing what it was intended to do. If your company is dealing with raw materials, you can't change them. TURA is putting a burden on those companies. The fee is too high.
4	The way they figure out the fees. They hit you harder on the amount of workers than on the amount of chemicals. I reduced chemicals, but I still have a lot of fees because I have a lot of workers.
4	The fees. Employee counts should be reduced. And money sent back for reduction.
4	The fees structure. Lower the cost.
4	Drop the annual fee.
4	Fees are excessive for small companies. Delisted items should be reviewed more quickly by the state.
4	The fees. Fees for wastewater treatment chemical use. Recertification requirements--recertification for specific certification should be less demanding than the general one.
5	De-list what materials have been federally listed (vs state listings).
5	The differences between the state and federal requirements.
5	The extent that the requirements are so rigid, and they don't always apply to every industry. I don't think they are narrowing in on the right toxins and pollutants with the threshold at 10000.
5	We can't affect toxic use reduction because we are only distributors. We have no say about what goes into the products, so the question doesn't really apply.
5	Recognize more ways to recycle, and re-evaluate the list of chemicals that TURA uses. It seems all right to meet TURA requirements without meeting the spirit.
5	Get rid of the plan. Match chemicals with feds (they're killing us).
5	Delist more metals for the metal stamping industry.
5	Would change the number of hours the planner has to accumulate within given time. Small firm has to spend same number of hours, spend a lot of time getting things delisted. Very irate about list of things that are listed but not really toxic. Only company to get certain chemicals get delisted. Fees are unfair, disproportionate for small firms. Whopping fees--it's unfair.
5	When a company uses a chemical as a product, they can't replace it. TURA should define more clearly the difference between a product and by-product. There should be exceptions made for people who have toxins as a product.
5	Chemicals removed from the list.
5	List of chemicals way too long. Forms are different, too long, and very difficult and very confusing. List of chemicals different from federal. No one utilizing information for the betterment of environment. Not possible to be involved and stay out trouble without hiring a consultant.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
5	The cost. The high base cost. Give a chance to get some of the cost back through grants. Delist the same chemicals as the federal programs. I would like to see some consistency between state and federal.
5	Reevaluation of listed chemicals, whether they should be deleted or not.
5	Align with federal line r form.
5	I would change reporting requirements from the federal to the state level. For example, the feds last year de-listed sulfuric acid.
5	I would like to see the Form S and the TURA program incorporated into one. I think it would simplify everything, especially paper work.
5	Food industry for cleaning chemicals should not be applicable. Food companies should be exempt for cleaning compounds.
5	Make it more user-friendly. It's too bureaucratic. The data they put out, the reporting package should be tied to Form R, which is put out by the EPA. It's really just a duplicate of Form R.
5	If there's no waste being generated, but we are using a chemical, like lead, (that is listed as a hazardous chemical) in a solid form (which we're not putting it into the environment), we should not have to file or get involved in these elaborate plans to reduce. They tell us to reduce it but we're not polluting with it. If we reduce, we lose profits with no benefit to the environment.
5	Method in which chemicals are listed and the way they are determined. Should follow federal guidelines, so there is one list.
5	Should look over how toxic particular chemicals are. Delisting some chemicals--too many. Fairly easy-to-follow format.
5	Delisting the elaminates associated with raw materials. I would like to see less waste.
5	Remove copper wire from list of toxic chemicals.
5	Delist common practices (common water). Base upon toxic management, not toxic reduction.
5	Delist certain chemicals.
5	Who would have to comply. A company who distributes chemicals has no need to comply with TURA. We don't use them; we just distribute them. The program is no use to me--it doesn't help me. It is just paperwork and a check I have to send.
5	Eliminate planning, reporting, and fees associated with combustion by-products, because it is duplicative with the Clean Air Act. Difficult to quantify amount of by-products going up the stack. Information created from planning/reporting of combustion by-products serves no useful purpose under intent of TURA.
5	Change the filing for stainless steel, or define those better for filing purposes.
5	There are some changes. The list of chemicals is confusing. The Form R is unnecessary, duplicative. The planning process, the second and third time around, is not yielding a lot of new information. Modify Form S to include questions on Form R and thus eliminate Form R.
5	I wouldn't require the development of Form R. Revise list of chemicals, because some are not that dangerous to the environment;
5	Majority of paperwork--it's very costly. Do not see purpose of Form S when there is Form R, but only written differently.
5	Like to see them not spend so much money promoting themselves. Additional state chemicals and limits should be changed to the federal level. (Form R and 16 s reports)
5	Reducing the fees, as well as delisting more metals.
5	Make exceptions for certain companies. Change the fees.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
5	I'd overhaul it. We did all the work TURA asks us to do before TURA was implemented, so it's just a bunch of extra paperwork. Revise Form S to be more like the EPA's Form R. Change reporting requirement time limits from two years to five years.
5	Like to see chemicals covered by TURA also be the same as those under SARA 313 federal regulation.
5	Cut back requirements on the pure metals.
5	Delist silver for manufacturers of silver products.
5	TURA requires specific SIC codes to file toxic plans. Wholesale distribution are such an SIC. This company repackages finished products that have reportable chemicals as a component which are purchased from third parties. By doing no blending, manufacturing, or processing, there is no toxic reduction available for a wholesaler.
5	Waste of time. Hidden state tax/fee goes to general fund. The chemicals which we use cannot be substituted (pH acid/base). Duplicative of SARA program.
5	Get rid of paper-pushing. Certain manufacturing fields are such that only so much can be done. Year after year of TURA reporting is not productive when so little can be improved. We are still burdened by the reporting requirements.
5	Change the list.
5	It is not doing what it was intended to do. If your company is dealing with raw materials, you can't change them. TURA is putting a burden on those companies. The fee is too high.
5	The list should match the federal list. I would like to see a financial incentive for going beyond the federal list.
5	Exclude stainless steel from the list.
5	Some of the chemicals don't belong on the list.
5	Same chemicals as the federal government. Less paperwork.
5	I think they go after the wrong people. I feel that the manufacturers of these materials should be targeted--force them to make the materials safer. TURA mandates the user and not the manufacturer. The manufacturer should bear the burden of making less toxic products.
5	I'd like to see some of the lists reduced. Either that or increasing threshold limits.
5	List of chemicals should be reduced over time.
5	Try to get list of chemicals coordinated with the federal programs. It gets a little confusing.
5	I'd target certain chemicals. I wouldn't make it as broad-based as it is.
5	Not classify copper as a toxic chemical.
6	Change threshold for defining who should be included. People in program should be those who can gain from reducing.
6	Easier for the small guy to fill out paperwork, more understandable.
6	I'd put in an exemption for small quantity emissions.
6	It is very time consuming. If companies are small it is very time consuming. It takes us away from doing those things that are important.
6	Eliminate the cost of toxics. And the financial analysis is too expensive for small companies.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
6	Financial planning requirements are covering a large range of companies, small and large. The amount of man-hours required for reporting is hard for a smaller company.
6	Simplify paperwork and process for small companies.
6	Discontinue TURA. Reduce fees. Change compliance requirements.
6	I think that they paint everything with a very broad brush. A small company with very few chemicals has to spend as much time and money as a large company. For a small company, we had to spend a lot of money between an outside consultant, lost time, etc. We are losing out. If it remains this way, us small guys will be gone. A company in a highly competitive industry can't have much expenses--we're on a 1.5 profit.
6	Too complex for our facility. With less toxics, set cut-offs to lower limit or thresholds.
6	I think they need to look at smaller companies and really look at the products. They should cut smaller companies some slack. They don't have all the facts from all the industries.
6	Lower the threshold to below 10,000 pounds.
6	I would eliminate the TURA summary plans every other year. The plan summaries tend to get a bit expensive. Some cost reduction is needed. It's just a headache for small companies, where everyone wears many hats. I think the general public will make TURA happen without the state's involvement.
6	The check we have to send in. Some of the reporting requirements. Review and change, in some cases, some of the limits.
6	I'm not sure the program itself is needed. Chemical companies should just use less toxic chemicals in general, but the small business community should be forced to comply with separate state and federal regulations that are different for different materials. It's a real paperwork nightmare, a bureaucratic mess.
6	I would gear it more towards small business, and make it more understandable. I had to hire someone to make sense of it for me and fill out the forms.
6	The companies I deal with would have to have enough quantity generated to make them worth dealing with. So TURA wouldn't be hassling small companies. Be more concerned about goals and results than tracking paperwork.
6	The whole method of reporting. The hours spent trying to straighten the forms out is ridiculous. If we could just report the amount of chemicals. A small company can't afford the man-hours. Eliminate the program.
6	Lower the thresholds for planning and reporting for people who use smaller quantities. Lower threshold for more hazardous chemicals.
6	I'd like to see some of the lists reduced. Either that or increasing threshold limits.
0	The basis for getting unit product. We need a more defined industry-specific definition.
0	We like the voluntary requirement aspect. Do more with the technology transfer. The fees are a little pricey.
0	Make the rules more specific to individual industries.
0	The fees. Greater flexibility for different companies. Being a recycling plant, we don't have much flexibility.
0	They are a manufacture and everything is based on usage; should be based on actual product.
0	The extent that the requirements are so rigid, and they don't always apply to every industry. I don't think they are narrowing in on the right toxins and pollutants with the threshold at 10000.
0	It's too hard to determine the difference between the bri and eri. It's a foreign number to us--it should be something more tangible.
0	Would eliminate bri and eri from production unit. Use only bri and eri from facility-wide. Continue process characterizations by production unit. Reduce the price.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
0	Don't know really anything specific to change. We're a freane industry; they should learn more about us.
0	Less prescriptive. Leave it up to the firms for compliance decisions.
0	Allow more flexibility in structure of TURA program. So much is irrelevant.
0	Get rid of it. No fees. Shouldn't have to file every year. If you've reached the goal, then you shouldn't have to report yearly or pay fees.
0	Control of unit of product.
0	I would like the program to be more localized.
0	Reporting language and definitions. Earlier follow-up on the part of regulating agencies. Simpler language in rule or regulation changes.
0	Lack of availability of TURA members--it can take up to a week to get an answer from them. The TURA planner requirement for applications should be 3 years, not two.
0	Recognize more ways to recycle, and re-evaluate the list of chemicals that TURA uses. It seems all right to meet TURA requirements without meeting the spirit.
0	They make it too difficult to estimate 4 years down the road--all we can do guess.
0	Change the frequency--every two years is aggressive. I would make it every 5 years. Reduce the fees for the annual report.
0	Better correlation between management and officials on the tracking of chemicals.
0	Everything should be tried and true. Too expensive to register. Conflicting information comes down, business gets blamed. They don't accept responsibility.
0	Point of diminishing returns where product substitution may be less toxic material but no vehicle on forms to show it (by quantity amount).
0	Start by doing electronic filing of reports and plans. Relook at toxics being selected on the list.
0	Easier paperwork. On a computer disc for electronic filing.
0	More information for primary people planning for company (new alternatives). General lingo on toxic reduction not laws and rules, but what's going on in the industry
0	Eliminate the cost of toxics. And the financial analysis is too expensive for small companies.
0	I think if anything, you could expand the internet services and make people more aware of this library of information.
0	Forecasting the plan summaries. Automating Form S.
0	When a company uses a chemical as a product, they can't replace it. TURA should define more clearly the difference between a product and by-product. There should be exceptions made for people who have toxins as a product.
0	New technologies for the program. Sometime it is very cloudy what I can use, as far as new technologies go.
0	Financial planning requirements are covering a large range of companies, small and large. The amount of man-hours required for reporting is hard for a smaller company.
0	In the plan update: 1) updated plan is going to require more work than it used to; and 2) once you reach a plateau, reduction is a waste of effort and capital.
0	Machining operations.
0	Make provisions for certain companies who can't reduce, because of what their customers require. For example, they make wire and cable that must be flame-retardant, but flame retardants are on the list.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
0	I don't like the fact that you need to have a certified planner sign the plan. I'd remove that. I also think that the fees are a little high. I do like the fact that numbers are normalized to production units.
0	The cost. The high base cost. Give a chance to get some of the cost back through grants. Delist the same chemicals as the federal programs. I would like to see some consistency between state and federal.
0	It's so new; can't say.
0	Regulators should do more audits.
0	I don't see much usefulness of TURA in my (semiconductor) industry. We have to use those chemicals. It's a big hassle because I only have to report a few chemicals.
0	I don't know.
0	I would get lists specific to chemical use at each production unit, in order to better track chemical use.
0	Make it easier for single site toxic planners to be certified based upon experience and projects on site. Encourage round table discussion at OTA/TURI for presentation on a case by case basis.
0	The plan summary data. Five years is a long way to project.
0	A data base with certification numbers. TURA planner has to keep track of ceu more classes to learn about new technology.
0	Take the regulatory part out and make it voluntary.
0	Make it relevant to the environment, not to raising money.
0	It's formed a large bureaucracy thing. Need to base themselves against standard. Take 1990 as a base to 1996 and see if it's made a difference (a state with TURA and a state without it, like Conn. and Mass.). Like to see TURA decreased. Go back to basics, more administrative.
0	It's difficult area. We're a unique business--only 2 of us in the world. Only problem is reduction of chemicals we use. We can't go more environmentally friendly for some chemicals. TURA plan only looks at numbers.
0	Wish TURA had more specific knowledge about their industry. They would be more effective if they knew more about the paper industry. They haven't offered much help.
0	It does have a limited benefit for companies, but it can only go so far in our company. There is only so far we can go in compromising our product. The enforcement of the program can be reduced because a company can only reduce so far. Some of the bureaucracy can be cut out. I wonder how important it is for the government to get all this information. Some of the information doesn't seem like it serves a great purpose.
0	I'd make it flexible enough to keep up with technology advancements in the industry. The program has very rigid dates of compliance to comply with regulations for finding new products and materials. TURA needs to be more industry-specific to tap for new guidelines.
0	Too much money in promotion of bureaucracy.
0	It has a lot of duplicity. They said it would not be punitive--now they're talking punitive. OTA is not worthwhile. It overlaps to many other reports we have to do. They ought to leave the administration in private tur hands. Get the government out of it.
0	The reporting elements. Some of the data doesn't serve a purpose, (indexes eri.) DEP being behind schedule.
0	Better defining the exemptions available to certain industries and certain materials. Prompt notification of changes to procedure (e.g., delisted metal chemicals--but the guidance is not yet available as to how they apply).

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
0	I don't see the point of it with the strict regulations under this state. With permits and the DEP, it is like a duplicate of work.
0	Reduce the formality of it, especially the report requirements and calculations. Not having to have it certified.
0	Unnecessary, repetitive, burdensome regulations, when fed regulations already exist. Law does not require goals to be met or actions to be taken. Environmental benefits of program do not equate to costs of implementing program. What program asks are already being done by good management practices. Law attacks problem from wrong perspective--look at total materials optimization (toxics and non-toxics).
0	Automate it like EPA has done.
0	Change the entire format for trying to produce a plan in-house. Being required to come up with a plan and implement it is not feasible. Because it is required, makes them use time to make up impractical plan.
0	Maintaining the license. They should have a more long-range education program.
0	I would reduce toxic waste use.
0	Less structured and less specific.
0	I think the top management needs to be better motivated to accept TURA seriously. That is where the problem lies.
0	I would get more seminars and meetings together for people involved in it. This guy loved TURA---it saved his company at least \$20,000.
0	I'd get rid of the by-products index.
0	The training. Get rid of the institute.
0	Work with industry to come up with other non-toxic products.
0	Have a broader selection of ways to get turp credits.
0	Allow exemptions for individual cases.
0	To maintain a constant number of chemicals. If they add chemicals, they should drop others that are less important.
0	I'd like to see it phased out after its goal has been achieved.
0	Make the program so a company can evaluate its process and report to the DEP. Right now, the companies are forced to do things whether they want to or not. The program needs to be more flexible. They need to work with industry more.
0	Make plan less prescriptive.
0	Simplify things. Go after big problems first.
0	Make some of the format of the report a little more flexible. Some parts seem very relevant while others are not. The program would be best if you determined what the results you wanted were.
0	The fees are way too high. The processes should be reviewed---some people just can't reduce their usage and have to pay for it. They should look at effects on other programs like air quality. For example, in order for Company R to improve air quality emissions, Company R has to use more TURA chemicals.
0	Prioritizes things which should not and it is too time consuming for a large company like ours. Give us the option of setting priorities or alternative options.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
0	As a company that uses a fairly large number of chemicals as raw product and has a low volume of by-product, I had to go through a lot of planning exercises for very little benefit. For example, we use a lot of chromium compounds in our liquid acid blends, but because of the way TURA is, measurable releases to the air and water are less than a pound per year. I have to go through a lot of paperwork for nothing, and I'm not about to give our customers a weaker product. I find the TURA process rather frustrating. I do not see ease of toxic use in the business of making toxic chemicals as defined by the TURA program.
0	Have the state not convince my customers that my products are toxic.
0	It's expensive to change things, and they have to realize that sometimes there are no substitutes for hazardous chemicals.
0	Reduce fees for general practice terms. Change the plan summary sheet.
0	I would change some regulations and approaches, but overall it's pretty comprehensive.
0	Address company-specific concerns. More information about TURA.
0	1994 summaries were very confusing--change the form of the data reports.
0	Usage should be important as by-products.
0	The people who give the class, write the test.
0	Get rid of mandatory planning. Eliminate fees. Substitute whole law with pollution prevention law that is more industry-friendly. The company doesn't need TURA. Volunteer basis is significant. Change the regulations to agree with the law. Don't allow the regulations to add to what's law.
0	Eliminate planning, reporting, and fees associated with combustion by-products, because it is duplicative with the Clean Air Act. Difficult to quantify amount of by-products going up the stack. Information created from planning/reporting of combustion by-products serves no useful purpose under intent of TURA.
0	I would eliminate the TURA summary plans every other year. The plan summaries tend to get a bit expensive. Some cost reduction is needed. It's just a headache for small companies, where everyone wears many hats. I think the general public will make TURA happen without the state's involvement.
0	The initial program is very drawn out, but finally now we see the benefits.
0	Frequency of having to do it.
0	Credit updates. Continuing education.
0	Make the reporting more voluntary, something you could do if you felt it was useful.
0	I would eliminate a lot of the paperwork and calculations. Figures should be submitted, but the state should do the evaluation. It would be more meaningful.
0	The certification process.
0	More communication between federal government and management.
0	I have a big problem with TURA's unit measurement. It's not relevant to my industry. It is difficult to calculate anything meaningful.
0	It would help if the Form S and toxic reduction form were due at different times. It would make the clerical work easier.
0	You need to spend more time on TURA in a company on the law than on the actual program.
0	Don't have the time to tell you. This is an inappropriate forum to discuss that.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
0	I'd overhaul it. We did all the work TURA asks us to do before TURA was implemented, so it's just a bunch of extra paperwork. Revise Form S to be more like the EPA's Form R. Change reporting requirement time limits from two years to five years.
0	The fee structure, flat fee. Need incentive when showing reduction, e.g., credit or reduced fees for favorable reduction. Take out the accounting portion--it is no one's business.
0	Some of the details of toxics not being significant.
0	Make chemicals cheaper.
0	Change the name to toxics use management. Get rid of the program.
0	It seems to be more focused on decreasing by-products rather than having actual toxics decreased. We're involved in chemically converting toxic chemicals in a reaction process, so the TURA program is in many ways not applicable to us. I would lower the fees on toxic chemicals use.
0	The reporting--it asks to go very in-depth about your finances in the report.
0	We have to use specific toxic chemicals which make it hard for us to comply.
0	It doesn't do anything for us, because if we change what we do, we're out of business.
0	Chemicals we used are those which our competitors use, and if we reduce or change chemical use, our product would be inferior.
0	By-product reduction index. Long-term projections. Fee system.
0	Change the definition of use. We don't use any toxic chemicals. It drives companies out of Massachusetts. We only process one chemical, and we can't replace it.
0	I don't know if I would have gotten into it in the first place. A lot of the bases TURA covers is covered by other regulations. Water is one of our most valuable resources, so changing toxins for water as a cleaner is just trading one for another.
0	Not to have to be a certified planner. This is a lot of effort and is too complicated. There are only a couple things we can do and we knew them already.
0	The way they figure out the fees. They hit you harder on the amount of workers than on the amount of chemicals. I reduced chemicals, but I still have a lot of fees because I have a lot of workers.
0	Not require a certified planner to plan.
0	Make the planning done once a year. As the planning gets better, make the requirements more stringent. Put in article exemptions (e.g., stainless). Make by-products such as weight of steel ground away used rather than total weight of product.
0	The planner training didn't outline the exam very well. The timeliness could be better. I have not received the results of my exam in time to finish the program.
0	I would reduce funding to zero. I'd put in a system, essentially a business decision. I'd keep TRI and make TRI more enforceable. The goals are good, but they try to bring everyone under the umbrella, even those who don't really apply. The costs of TURA make us less competitive than out-of-state competitors who don't have to deal with TURA. There is no cost-competitive alternative to many of the chemicals we use, so we have to pay a fine. If you want to implement TURA, give us alternatives.
0	The list should match the federal list. I would like to see a financial incentive for going beyond the federal list.
0	The fees. Employee counts should be reduced. And money sent back for reduction.
0	More proactive for specific solutions for our industry.

Appendix A: Verbatim responses and response codes for question 5.1: "What would you change about the TURA program?"

<i>Code</i>	<i>Response</i>
0	Since implementation, chemicals have gone on the list and been delisted. If you target a chemical and the list changes, you're lost. They're giving us regulations on the fly and expecting us to adapt. It is redundant of other programs, and I think the intent is being lost in the bureaucracy. For the company, it is a bitter pill, because we have to use a consultant, and there is a cost thing.
0	Fees are excessive for small companies. Delisted items should be reviewed more quickly by the state.
0	Make the reporting requirements every three years.
0	TURA was implemented in mirroring the 20-39. They pulled TURA in, and it is not even applicable. One of our chemicals is water. We're not even responsible under DEP. We're just feeding money to the state. It has becoming a political parasite. I hear they are misappropriating the funds.
0	Eliminate the need for certification to be a planner.
0	Too much paperwork. More credit given for recycling of material not integral to the process.
0	Change the whole program.
0	Offer financial assistance for small to medium-sized companies for capital improvements.
0	I think they go after the wrong people. I feel that the manufacturers of these materials should be targeted--force them to make the materials safer. TURA mandates the user and not the manufacturer. The manufacturer should bear the burden of making less toxic products.
0	The type of training. Material is very confusing--very confusing case study.
0	Devise rating system for toxicity of chemicals.
0	The fees. Fees for wastewater treatment chemical use. Recertification requirements--recertification for specific certification should be less demanding than the general one.
0	Change from federal government to state could have been clearer. More informed and better organized government level.

Appendix B: Survey Population by 2-digit SIC Code

SIC	Industry Sector	Percent in SIC Code		
		Survey Pop.	Respondents	Nonrespondents
34	FABRICATED METAL PRODUCTS	17.7%	18.7%	15.4%
28	CHEMICALS AND ALLIED PRODUCTS	16.3%	16.4%	16.3%
36	ELECTRICAL AND ELECTRONIC EQUIPMENT	9.9%	9.9%	10.1%
33	PRIMARY METAL INDUSTRIES	7.9%	7.8%	7.7%
30	RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS	7.8%	7.6%	8.2%
26	PAPER AND ALLIED PRODUCTS	6.4%	6.9%	5.3%
22	TEXTILE MILL PRODUCTS	5.3%	5.1%	5.8%
49	ELECTRIC, GAS, AND SANITARY SERVICES	4.0%	4.6%	2.9%
20	FOOD AND KINDRED PRODUCTS	3.7%	3.2%	4.8%
38	INSTRUMENTS AND RELATED PRODUCTS	3.6%	3.5%	3.8%
39	MISCELLANEOUS MANUFACTURING INDUSTRIES	3.3%	3.2%	3.4%
35	MACHINERY, EXCEPT ELECTRICAL	2.3%	2.8%	1.4%
25	FURNITURE AND FIXTURES	1.6%	1.8%	1.0%
72	PERSONAL SERVICES	1.6%	1.4%	1.9%
37	TRANSPORTATION EQUIPMENT	1.6%	1.4%	1.9%
31	LEATHER AND LEATHER PRODUCTS	1.4%	0.9%	2.4%
51	NONDURABLE GOODS	1.4%	1.2%	1.9%
27	PRINTING AND PUBLISHING	1.2%	1.4%	1.0%
32	STONE, CLAY, AND GLASS PRODUCTS	0.9%	0.9%	1.0%
24	LUMBER AND WOOD PRODUCTS	0.5%	0.2%	1.0%
29	PETROLEUM AND COAL PRODUCTS	0.5%	0.0%	1.4%
23	APPAREL AND OTHER TEXTILE PRODUCTS	0.3%	0.2%	0.5%
47	TRANSPORTATION SERVICES	0.2%	0.2%	0.0%
17	SPECIAL TRADE CONTRACTORS	0.2%	0.2%	0.0%
45	TRANSPORTATION BY AIR	0.2%	0.0%	0.5%
00	UNKNOWN	0.2%	0.2%	0.0%
75	AUTOMOTIVE REPAIR, SERVICES, AND PARKING	0.2%	0.0%	0.5%
76	MISCELLANEOUS REPAIR SERVICES	0.2%	0.2%	0.0%

		Total Facilities:	100%	100%	100%
SIC	Industry Sector	Number in SIC Code			
		Survey Population	Respondents	Nonrespondents	
34	FABRICATED METAL PRODUCTS	114	81	32	
28	CHEMICALS AND ALLIED PRODUCTS	105	71	34	
36	ELECTRICAL AND ELECTRONIC EQUIPMENT	64	43	21	
33	PRIMARY METAL INDUSTRIES	51	34	16	
30	RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS	50	33	17	
26	PAPER AND ALLIED PRODUCTS	41	30	11	
22	TEXTILE MILL PRODUCTS	34	22	12	
49	ELECTRIC, GAS, AND SANITARY SERVICES	26	20	6	
20	FOOD AND KINDRED PRODUCTS	24	14	10	
38	INSTRUMENTS AND RELATED PRODUCTS	23	15	8	
39	MISCELLANEOUS MANUFACTURING INDUSTRIES	21	14	7	
35	MACHINERY, EXCEPT ELECTRICAL	15	12	3	
25	FURNITURE AND FIXTURES	10	8	2	
72	PERSONAL SERVICES	10	6	4	
37	TRANSPORTATION EQUIPMENT	10	6	4	
31	LEATHER AND LEATHER PRODUCTS	9	4	5	
51	NONDURABLE GOODS	9	5	4	
27	PRINTING AND PUBLISHING	8	6	2	
32	STONE, CLAY, AND GLASS PRODUCTS	6	4	2	
24	LUMBER AND WOOD PRODUCTS	3	1	2	
29	PETROLEUM AND COAL PRODUCTS	3	0	3	
23	APPAREL AND OTHER TEXTILE PRODUCTS	2	1	1	
47	TRANSPORTATION SERVICES	1	1	0	
17	SPECIAL TRADE CONTRACTORS	1	1	0	
45	TRANSPORTATION BY AIR	1	0	1	
00	Unknown (or 72)	1	1	0	
75	AUTOMOTIVE REPAIR, SERVICES, AND PARKING	1	0	1	
76	MISCELLANEOUS REPAIR SERVICES	1	1	0	
Total Facilities:		644	434	208	