

# Study of the Lithographic Printing Industry in Wisconsin

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## Results of a Mailed Questionnaire

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Prepared for:  
Citizens for a Better Environment

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# Executive Summary

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## Purpose

This report presents the results of a survey of Wisconsin lithographic printers. In 1997, the Great Printers Project was initiated by a partnership of public and private organizations. One of the partners, Citizens for a Better Environment (CBE), assumed responsibility for developing baseline measures for the Project against which changes could be measured. This research was undertaken to provide those baseline measures.

## The Study

The research was conducted during the summer and fall of 1997 by Applied Research Systems, Inc. (ARS), an independent consulting group located in Madison, Wisconsin. The report draws on a mailed questionnaire administered to the 695 lithographic printers in Wisconsin; 116 printers which signed up for the Great Printers Project and 579 other printers identified by the Department of Industry, Labor and Human Relations' Standard Industrial Code 2752. Standard mailed questionnaire techniques were used to implement the study. All correspondence to and contacts with the printers were made by staff of ARS. After four mailed contacts, useable questionnaires were returned by 52 percent of the Great Printers and 21 percent of the non-Great Printers yielding a combined response rate of 26 percent.

In addition to the survey data, this report includes direct quotations generated from in-depth personal interviews conducted with printers. These quotations have been inserted to add context to some of the thinking that underlies the survey responses.

## Findings

To anticipate the detailed findings in the report, survey results disclosed:

Great Printers tend to be larger companies than non-Great Printers.

Printers that enrolled in the Great Printers Project are larger than non-Great Printers; a typical Great Printer has more than twice as many employees and operates a few more presses.

Great Printers are more concerned than are non-Great Printers about waste management and environmental regulations.

Printers are concerned about numerous waste and regulatory issues. They expressed particular concern for rule applications, obtaining information on how to comply with regulations, health effects from printing chemicals, and possible liability from the generation of hazardous wastes. Overall, on nine of 10 waste and regulatory issues, Great Printers were significantly more concerned than non-Great Printers.

Great Printers and non-Great Printers rely on different methods to manage their wastes.

All lithographic printers generate similar wastes. However, survey results disclose that printers manage their wastes differently. In general, Great Printers are more likely than non-Great Printers to use a treatment, storage or disposal facility (TSD).

Waste ink presents the most difficult problem for printers.

Forty percent of the printers indicated that ink was most problematic for them to manage and one-third (34%) of all printers reported that ink was the most expensive waste for them to manage.

There is fairly strong support for a program to help printers dispose of waste inks and oils.

Nearly three-fourths of the printers said they were interested in a "clean-sweep" type program organized by local government and/or a trade association that would help them dispose of waste inks and oils.

Printers identified a number of different ways they've reduced or kept constant the wastes they generate.

During the past two years, the most common change printers have made to minimize the wastes they generate has been to change the chemicals used in the printing process. They've been reluctant to modify their press operations.

Printers joined the Great Printers Project because they want more information.

The incentive for joining the Great Printers Project was to become educated on environmental regulations and to learn better waste management practices. Marketing and public relations were insignificant reasons for joining the Project. Just over one-third of the Great Printers said they had already realized some direct benefit from the Project.

Customer demand for environmentally friendly printing is limited primarily to uncoated and/or recycled paper.

Paper type, meaning uncoated or recycled, is the most common customer request for printing options which are friendly to the environment. Requests for the use of unbleached paper, low or no-VOC chemicals, and recycled ink are almost unheard of.

Customers rarely, if ever, ask about a printer's chemistry (low VOC inks), equipment, or printing techniques (electronic pre-press).

Regardless of printer type, few printers receive inquiries about their printing operation. One possible conclusion is that customers are uneducated about the printing process. With the exception of recycled and uncoated paper, customers do not know what questions to ask a printer about his/her operation.

Suppliers are the most important source of information for printers on waste management and on health and safety issues.

Printers rely on their "own kind" for information on waste management and on health and safety issues; suppliers and vendors, TSD's, people within their own company and fellow printers were primary information sources. Minor sources of information include those employed by the Department of Natural Resources and the University Extension.

Employees of Great Printers are more likely than non-Great Printer employees to attend professional conferences and to have a wider range of information sources.

Printers that joined the Great Printers Project are more likely than non-Great Printers to attend Print 97/Converflex-USA. They are also more likely to have had contact with the University of Wisconsin-Extension's Solid and Hazardous Waste Education Center (SHWEC), and to have access to and to utilize the Internet. Very few printers are aware of the Printers' National Environmental Assistance Center (PNEAC) as a source of technical assistance for printers.

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# Introduction

This report summarizes the results of a survey of Wisconsin lithographic printers. In 1997 the Great Printers Project was initiated by a joint effort of the Department of Natural Resources, the Printing Industry of Wisconsin, Citizens for a Better Environment (CBE), and the University of Wisconsin-Extension's Solid and Hazardous Waste Education Center. CBE assumed responsibility for developing baseline measures for the Project against which changes could be measured. This study was undertaken to provide those baseline measures. The research was conducted during the summer and fall 1997 by Applied Research Systems, Inc. (ARS), an independent research group located in Madison, Wisconsin.

## Research Objectives

In meetings between ARS and CBE, the following research questions for a survey were defined:

- What wastes do printers generate?
- How are these wastes managed?
- What concerns do printers have about wastes they generate and the way they are regulated?
- What changes have printers adopted to minimize the wastes they generate?
- If printers signed up for the Great Printers Project, why did they do so?
- What requests are printers hearing from customers for "environmentally friendly" printing?
- Where do printers obtain information on waste management as well as health and safety issues?

## Data Collection and Methodology

A 16-page questionnaire was mailed to the 695 lithographic printers in Wisconsin; 116 printers which signed up for the Great Printers Project and the 579 non-Great Printer Project printers identified by the Department of Industry, Labor and Human Relations' Standard Industrial Code 2752. Standard mailed questionnaire techniques were used to implement the study. Four contacts were made using the following procedure:

- An advance letter announcing the survey and its purpose was mailed to all printers.
- Next, the questionnaire with accompanying cover letter and a stamped return envelope were mailed.
- About 10 days later, a postcard was mailed to all printers. The postcard served as a reminder to those who had failed to return the questionnaire and as a thank you to those who had already responded.
- About 10 days after the postcard, a second questionnaire with cover letter and stamped return envelope were mailed to all non-respondents.

Completed questionnaires were returned by 175 printers. Table 1 presents the number of completed questionnaires by printer type and their respective response rates. Eliminating the 29 questionnaires which were undeliverable brought the actual sample size down to 666. The final response rate was 26 percent; 52 percent of the Great Printers returned usable questionnaires compared to 21 percent for non-Great Printers.

Table 1: Completed questionnaires by Project participation

Printer Type	Mailed	Returned	Response Rate	Percent of Sample
Great Printer	116	60	52%	34%
Non-Great Printer	550	115	21%	66%
TOTAL			26%	100%

Data were disaggregated by Great Printer (GP) and non-Great Printer (non-GP) status. In addition, the data were examined by printer size, defined by number of employees—small printers with 1 to 10 employees and large printers with more than 10 employees. (See Appendix 1 for a summary of analysis by printer size.)

Throughout the report we have included direct quotations from personal interviews with printers conducted prior to and after the survey. The quotations appear in *italic* and have been inserted to add context to some of the thinking that underlies the survey responses.

# Survey Results

## Section I: Information on the Lithographic Printing Business

Great Printers tend to be larger companies than non-Great Printers.

Printers that enrolled in the Great Printers Project are larger than non-Great Printer companies; a typical Great Printer has more than twice as many employees and operates a few more presses. Great Printers are also more likely than non-Great Printers to operate web presses though the vast majority of all printers operate sheet fed presses. Somewhat surprising is that no difference is found between ownership by a parent company.

Table 2: Number of employees, number of presses, type of printer, and parent ownership.

	GP	Non-GP	Total
<b>Number of employees</b>			
1-2	0%	13%	9%
3-5	16	33	28
6-10	25	18	20
11-15	9	12	11
16-99	34	18	24
100 or more	16	6	9
Average number of employees	75	32	47
1-10 employees	41%	64%	57%
11+ employees	59	36	44

	GP	Non-GP	Total
<b>Number of presses</b>			
0	2%	2%	3%
1-2	14	29	25
3-5	52	47	47
6 or more	32	22	25
Average number of presses	6	4	5
<b>Press type</b>			
Primarily a sheet fed press	80%	90%	89%
Primarily a web press	16	7	9
Some other type?	4	3	4
<b>Owned by a parent company</b>			
Yes	11%	11%	11%

OBSERVATIONS: Large printers found the Project more attractive than did small printers.

- The Great Printers Project attracted larger printing companies. Great Printers had an average 75 employees while non-Great printers average 32 employees.

Five or fewer employees work at 16% of the Great Printers and 46% of the non-Great Printers.

- More than one-half (57%) of the printers are in business with 10 or fewer employees; 43% of the printers have 11 or more employees.

- Great Printers are slightly more likely to operate more presses than are non-Great Printers.

Three or more presses are operated by more than eight in 10 (84%) Great Printers and by nearly seven in 10 (69%) non-Great Printers. Overall, lithographic printers operate an average of five presses.

- The vast majority of lithographic printers in Wisconsin operate sheet fed presses. Approximately nine printers in 10 (89%) operate sheet fed presses.

Great Printers are more likely than non-Great Printers to operate web presses—16% compared to 7%, respectively.

- Non-Great Printers are just as likely as Great Printers to be owned by a parent company. Approximately one printer in 10 (11%) is owned by a parent company.

## Section II: Waste and Regulatory Concerns

More Great Printers than non-Great Printers say they have waste and regulatory concerns.

Printers are concerned about numerous waste and regulatory issues. They expressed particular concern for rule applications, obtaining information to comply with regulations, health effects from printing chemicals, and possible

liability from the generation of hazardous wastes. Overall, on nine of 10 waste and regulatory issues, Great Printers were significantly more concerned than non-Great Printers.

Table 3: Waste and regulatory concerns of lithographic printers.

	(% major concern)		
	GP	Non-GP	Total
Knowing which rules apply to you.	80%	69%	72%
Having enough information on how to comply with environmental regulations.	71	57	61
Possible health effects from printing chemicals.	64	52	57
Keeping current with environmental rules.	73	48	56
Potential liability for the hazardous wastes that printing generates.	60	50	54
The DNR's lack of understanding of the printing industry.	49	46	47
Knowing that your hauler properly disposes of hazardous wastes.	55	39	45
Educating pressmen and other employees on environmental management including pollution prevention.	44	36	39
Knowing who to contact to remove wastes that may be hazardous.	29	33	32
Knowing how to calculate air emissions from printing processes.	36	21	26

OBSERVATIONS: Significant differences were found between Great Printers and non-Great Printers for numerous waste and regulatory concerns.

- Knowing which rules apply to a printer was a major concern for eight in 10 (80%) of the Great Printers and nearly seven in 10 (69%) of the non-Great Printers.
- Having enough information on how to comply with environmental regulations was a major concern for approximately seven in 10 (71%) Great Printers and 57% of the non-Great Printers.
- Nearly two-thirds (64%) of the Great Printers compared to just over half (52%) of the non-Great Printers expressed major concern over the possible health effects from printing chemicals.
- Nearly three-fourths (73%) of the Great Printers compared to just under half (48%) of the non-Great Printers expressed major concern with keeping current with environmental rules.
- Potential liability for the hazardous wastes that printing generates was a major concern for 60% of the Great Printers and one-half (50%) of the non-Great Printers.
- Knowing that your hauler properly disposes of hazardous wastes was a major concern for slightly more than half (55%) of the Great Printers and 39% of the non-Great Printers.
- Overall, printers expressed less concern for knowing how to calculate air emissions from printing processes (26%), knowing who to contact to remove wastes that may be hazardous (32%), educating pressmen and other employees on environmental management including pollution prevention (39%), and the DNR's lack of understanding of the printing industry (47%).

During the interviews, some printers stated that they don't know how to dispose of some of their wastes. This may be symptomatic of waste management problems that printers may have. Others simply flush some wastes down the drain.

*We have a by-product from our plate processor when we process metal plates. That's the one thing I have yet to figure out what we're supposed to do with. I don't know what other people are doing. When we have to dump that thing out, we end up with about four gallons of gunk.*

*We had process plates and everything goes down the drain when we rinse it off. I'm not saying it's right, it's just what we do.*

*I've got a couple of 55 gallons of just sludge. Old ink. Old sludge. I'd like to find a place to get rid of it.*

Small printers would appreciate information not only on what the laws are but also how to comply with them.

*I heard air pollution laws mentioned. How come no one has told us what the new law is? What's with being so secretive? Why can we get information? If it affects our industry and it's aimed at us, why can't somebody tell us what this law is? We'd love to comply. It's going to be low cost, I'm sure. Help us comply.*

Printers are concerned about protecting their health and that of their workers. This motivates them to look for safer products.

*All those chemicals make me very nervous. Especially after going through a hazardous materials safety program.*

*Non-alcohol substitutes are the wave of the future. [Why?] Health and safety. Alcohol works fine but it's a safety issue.*

*There have been a lot of changes in the composition of blanket washes in the last five to 10 years. Used to be you'd walk in and smell them and they'd just about knock you out. Then you get the safety sheets on them and they'd say 'carcinogenic' and maybe we shouldn't be using this. A lot of them have become more water soluble and more user friendly.*

Some printers don't have time to comply.

*This is not something we devote a lot of time to. Because A: we don't have the time and B: we don't have to and C: it's just one more thing that's not getting done if we're doing this. It's not that we don't want to comply or do the right thing. It's just the mechanism to do it is so cumbersome, in many cases, or so expensive in others, that it's just easier to blow it off.*

There is also little likelihood of enforcement action.

*We're small printers. Low profile. I don't even have a sign outside my office. Chances of the DNR stumbling into my office are zero.*

Survey respondents were also asked to indicate which waste and regulatory issue is the greatest concern to them. Results indicate little difference between printers.

- The issue of greatest concern, expressed by 45% of both the Great Printers and non-Great Printers, is knowing what rules they are subject to.
- Other leading concerns, but to a much lesser degree include having enough information on how to comply with environmental regulations (13% overall) and possible health effects from printing chemicals (12% overall).

Discussions that were held with printers revealed that some printers were accumulating small quantities of waste inks, oils, etc. and didn't have a safe or convenient means of disposing of them. Survey results indicate that the accumulation of small quantities of waste inks and oils is a concern for only a minority of printers.

- Approximately one-fourth (26%) of the Great Printers and nearly one-third (31%) of the non-Great Printers expressed some concern.
- Overall, the accumulation of small quantities of waste inks and oils was a concern for 30% of the printers.

Small printers have a problem with hazardous wastes because they generate only small quantities of such wastes. This means they may have small quantities of such wastes around the shop for years, or may take a year or more before they accumulate a sufficient quantity of wastes to require the services of a TSD.

*Trouble is that we don't go through enough of it [fixer] and it takes us a year to get enough. And Safety-Clean doesn't like that.*

*I've got some ink that's 19 years old.*

During the personal interviews some printers suggested the creation of a clean sweep program for small printers with ink problems.

*You could be the biggest help to us by having a central point where you would collect ink every six months. Where all the little printers could say, 'Hey, we got a free day, we're going to dispose of it properly. Let's put it here. Thanks guys.'*

As a means to dispose of small quantities of troublesome waste, printers were asked if they would be interested in a "clean sweep" type program organized by local government and/or a trade association that would help them dispose of these wastes. Results indicate that there is fairly strong support for a program to help printers dispose of waste inks and oils.

- Overall, nearly three-fourths (73%) of the printers said they were interested.
- More than eight Great Printers in 10 (82%) and two-thirds (67%) of the non-Great Printers were interested.

Great Printers and non-Great Printers rely on different methods to manage their wastes.

All lithographic printers generate similar wastes. However, survey results disclose that printers manage their wastes differently. In general, Great Printers are more likely to rely on a treatment, storage or disposal facility (TSD) while non-Great Printers were more likely to rely on some other method for waste management.

Table 4: Waste generated by printers and how that waste is managed.

	GP	Non-GP	Total
Paper	97%	97%	97%
Recycled	98	94	96
Sent to a TSD	0	3	2
Other	2	3	3
Ink	93%	89%	91%
Recycled	13	14	14
Sent to a TSD	67	41	51
Other	20	45	35
Wipes/Rags	93%	95%	94%
Recycled	28	34	31
Sent to a TSD	56	45	48
Other	17	22	21
Spent developer	90%	81%	83%
Recycled	15	14	15
Sent to a TSD	54	29	38
Other	31	57	47
Spent fixer	86%	81%	83%
Recycled	16	20	19
Sent to a TSD	52	38	43
Other	32	42	38
Aluminum plates	88%	88%	88%
Recycled	78	95	89
Sent to a TSD	10	4	6
Other	12	1	5
Film	90%	82%	84%
Recycled	65	81	75
Sent to a TSD	23	7	13
Other	12	12	12
Blanket wash	74%	81%	79%
Recycled	5	13	10
Sent to a TSD	76	43	54
Other	19	44	35
Fountain solution	81%	81%	81%
Recycled	2	7	5
Sent to a TSD	33	20	24
Other	65	73	71
Empty containers	93%	94%	94%
Recycled	31	64	53
Sent to a TSD	19	4	9
Other	50	32	38
Wooden pallets	76%	66%	69%
Recycled	73	86	81
Sent to a TSD	4	0	2
Other	22	14	18

OBSERVATIONS: Substantive differences were not found between Great Printers and non-Great Printers in the wastes they generated. However, differences were found in how various wastes were managed by printers.

- Paper: Regardless of Great Printer status, nearly all paper is recycled.
- Ink: Great Printers are most likely to send waste ink to a TSD (67%) while non-Great Printers are most likely to manage it in some unknown manner (45%) or send it to a TSD (41%).
- Wipes/Rags: Great Printers are more likely (56%) than other printers (45%) to rely on a TSD.
- Spent developer: Great Printers are most likely to manage spent developer by relying on a TSD (54%) while non-Great Printers are most likely to manage it in some way other than a TSD or by recycling (71%).
- Spent fixer: Likewise, Great Printers are most likely to manage spent fixer by relying on a TSD (52%) while non-Great Printers are most likely to manage it in some unknown manner (42%) or send it to a TSD (38%).
- Aluminum plates: Regardless of Great Printer status, nearly all aluminum plates are recycled, although Great Printers are somewhat more likely to manage the waste via a TSD or in another manner.
- Film: Printers manage waste film primarily by recycling it, although more non-Great Printers rely on recycling (81%) and a significant minority of Great Printers rely on a TSD (23%).
- Blanket wash: Great Printers rely primarily on a TSD (76%) to manage their waste blanket wash while non-Great Printers are most likely to manage it in some unknown manner (44%) or send it to a TSD (43%).

- Fountain solution: Two-thirds (65%) of the Great Printers and three-fourths (73%) of the non-Great Printers manage this in some way other than by recycling or sending it to a TSD.
- Empty containers: Non-Great Printers recycle their empty containers (64%) while Great Printers use some way other than recycling or sending it to a TSD (50%).
- Wooden pallets: Regardless of Great Printer status, nearly all wooden pallets are recycled.

The printers we met with were diligent in managing their wastes. If they could recycle a waste, they did. If the waste was hazardous, they sent it to a TSD. One printer summarized the waste management practices of most printers by stating:

*We recycle all our film. The rags go to the rag people and get recycled. We recycle the developer. And the fixer is also recycled through the filtering system. The silver people provide the canister to filter your silver and pick up the film.*

## Paper waste

*The paper waste we generate is all recycled. We sell that back. We bundle it up. We sell it to Peltz.*

*Paper is the biggest recycling that we do. We have a company that comes in and picks up all our recycled paper. We keep it all separated from our trash.*

## Waste ink

*We use Safety-Clean as an ink recovery program. They provide us with a five gallon pail and we just put all our waste ink in there and when the five gallon pail is full they haul it off.*

*We try to use as much as we can because it's not cheap. Any leftover ink in the fountains are put in a little waste and once they dump that in a big waste can that gets hauled away by Safety-Clean.*

Some printers recycle and reuse their waste ink.

*When you finish the day's run there's oftentimes a lot of ink left in the fountain. They take a big spatula and run it across and put it back in the can. Maybe that's the cheap way to do it. We don't like to waste anything so that's what's done with the ink.*

Not every printer thinks the ink is a hazardous waste.

*In theory, the ink I put in my fountain, now it's in contact with the fountain concentrate, now it's hazardous. Come on. It's soy based ink. You can eat two pounds of it and you're not going to die.*

## Shop rags

*Our shop rags are given to an operation that collects them every week and they take them and they clean them and they dispose of that type waste.*

*My concern is the rags. The company we're using says that if you squeeze them the best you can, that's what we do. We put them in a strainer at the end of the day, the excess comes out and goes into the Safety Clean barrel. The rags go back to be recycled and washed and so on. Again, there's excess in there that I can't control. When they wash those rags, what happens to the fluid?*

## Spent fixer

*The fixer is the only thing you cannot, under any circumstances, get rid of. We put it in a drum and have Safety Clean come and get it.*

## Silver disposal

*The silver that is generated from the film is filtered out in our processors. And then after so long we'll take and sell the silver back. You don't make a ton of money, it's so slight. But that's all filtered out. None of that goes into the drain or anything.*

*We've got our waste pretty much under control. One of the things we're using is Environmental Silver to recover our waste from plate processing. They do a fine job for small printers and it's not a big cost. It's just a simple filtering unit and the filter itself will last four years. At the end of that time they come and change the filter in the canister. You get paid for the silver that's recovered.*

## Film

*Any extra film we may have is sold back or recycled. We don't throw a lot of stuff away. It's all recycled or dealt with in a different manner.*

*Were recycling all our scrap film and the recovered silver.*

*We use negatives and when we accumulate negatives that have no further use, we sell them for silver recovery.*

## Plates

*We're recycling our plates. We save a lot of the plates. We don't throw everything out.*

*The heaviest part of our work is on metal plates. We use paper plates for shorter runs. We accumulate a load and then we sell them for salvage.*

Some printers have a hard time finding someone to recycle their plates.

*We throw the silver master plates in the trash. We haven't anyone to recycle them.*

*There used to be companies that would take it and recover the silver but the recovery rate was so low that once the price of silver went down, it wasn't worthwhile anymore. We can't find anyone to take our plates.*

## Rinse water

*Everything is filtered and reused, filtered and reused. And we'll clean the filters out.*

## Wooden pallets

*One thing we had a terrible time getting rid of are wooden skids. The goddam things stack up in the shop and on the back dock. Nobody wants them. They're a pain in the neck to haul to the dump. It's hard to get rid of skids and they're a nuisance to have around.*

As a follow-up to the waste inventory, survey respondents were asked if there are wastes that are particularly difficult to manage. Regardless of printer status, waste ink presents the most difficult problem for printers—40% indicated that ink was most problematic for them.

- A distant second was blanket wash—one printer in eight (13%) said they had serious problems managing their waste blanket wash.

NOTE: The question of identifying the waste which is most difficult to manage resulted in a high non-response rate; many printers did not answer the question.

In addition, printers were asked which waste was the most expensive for them to manage. Again, results show that waste ink is most expensive for printers to manage.

- One-third (34%) of all printers reported that ink was the most expensive waste for them to manage—nearly one-half (47%) of the Great Printers and one-fourth (26%) of the non-Great Printers so indicated.
- Other wastes that were considered expensive to manage include paper (15%), wipes and rags (15%), and blanket wash (11%).

Small printers seem to have the most trouble managing their waste inks. They generate small quantities of such inks and these inks accumulate over time and printers don't have a ready outlet for their disposal.

*I think that ink is one of the main problems of the small printer. What are you going to do with the ink? It's well below the minimums but you got that much ink. Where do you go with it? It would be nice if you could put it in this five gallon bucket and one of these companies will come around, like they pick up your towels, and take it with them.*

*I think ink is the biggest question because we either dispose of it in small amounts or hold it in cans like everybody else does.*

*The inks are the thing that our main concern. We either dispose of it in small quantities or, if there's more sizable amounts, we put it in five pound cans and store the cans. We've also got 55 gallon drums of general sludge that I've got to find a source for. The inks are the number one concern for me.*

# Section III: Waste Minimization

Printers identified a number of different ways they've reduced or kept constant the wastes they generate.

During the past two years, the most common change printers have made to minimize the wastes they generate is a change in the chemi-

cals used in the printing process. Printers are least likely to modify their press operations.

Table 5: Changes made by printers to reduce or keep constant the wastes they generate.

	GP	Non-GP	Total
Modified or substituted chemicals such as less toxic inks, vegetable based inks, inks with low VOC's, low-VOC fountain solutions, adhesives with low VOC's, pre-press chemicals or films that are less toxic or that generate less waste, or blanket or roller washes lower in VOC's.	78%	79%	79%
Implemented good operating practices such as changed from small volume containers to bulk containers to minimize discarding of empty containers, began using alternative packaging to reduce amounts used or wasted, adopted inventory controls or better labeling procedures to reduce disposal of out-dated chemicals.	66%	53%	58%
Modified image-making or pre-press operations such as switched to computer image editing, adopted platemaking technologies that reduce waste such as waterless or non-silver plates.	48%	43%	45%
Modified press operations such as ink levelers, fountain chillers, automatic blanket washers, or water developed litho plates.	35%	27%	30%

**OBSERVATIONS:** As a way to minimize their wastes, printers have adopted chemical modifications or substitutes; they've been less likely to modify their press operations.

- Regardless of printer type, approximately eight printers in 10 (79%) said they had modified or substituted chemicals as a way to minimize their wastes.
- Great Printers were more likely than non-Great Printers to change their

operating practices in order to minimize their wastes; two-thirds (66%) of the Great Printers and just over half (53%) of the non-Great Printers made such changes.

- Just over two printers in five (45%) said they modified their image-making and pre-press operations.
- A significant minority of 30% said the modifications to their press operations resulted in reduced wastes.

Some printers told us they are having a hard time eliminating isopropyl alcohol. This is due, in part, to how their equipment responds to alcohol substitutes.

## Chemical modifications

*We are working very hard on replacing isopropyl alcohol. We are using alcohol substitutes. We have one press that's running alcohol free. Some people are having good success with alcohol substitutes and some are not. It seems that it has to do a lot with the piece of equipment, the manufacturer of the equipment.*

*Part of the problem is getting the people in the shop or on the shop floor to make the transition to non-alcohol substitutes.*

*The other thing you have to change is the mind set of the guys that are running the equipment. They are used to this alcohol which is a snap to run and they know how to make it work. Now you're going to change something on them and they are kind of hesitant.*

*Soy inks—we don't use them. They don't have the printing qualities and the price isn't competitive with some of the others. It's like recycled paper. It sounds great. Until recycled paper becomes competitive with virgin paper, your market isn't going to be there. Who's going to pay more unless you're a green-treer or a green-peacer.*

*Alcohol substitutes. That's another thing we've tried. And so far they don't work. New ones keep coming out but so far it hasn't worked.*

*With fountain solutions, I don't know how many still use alcohol. We still run alcohol on one of our presses. We're trying to switch over to an alcohol substitute but it's a very difficult process.*

*When people were saying we want this printed on soy ink. Those first inks were not geared for our press. We just couldn't get a good quality. So we'd have to call up the customer and say this isn't working. We lost a couple jobs that way.*

## Modified operating practices

Larger printers benefit from buying in bulk. Suppliers will reuse the containers they ship their products in. Smaller printers who buy smaller quantities less frequently don't have this opportunity.

*If you're a little bigger you use drums. So you don't have any waste ink because they refill the totes so you don't have. Whereas the smaller printers get them in five gallon pails and you've got that.*

*We use bulk containers. That really helps.*

## Modified image-making operations

*We make plates with a silver solution that we recover. The tanks that now do the developing are much smaller than they used to be. So instead of having a three gallon container to process the plate, it's now only a gallon container. This reduces the waste significantly.*

The survey also revealed that two-fifths (40%) of the printers were currently considering or experimenting with chemistries or procedures that could reduce their wastes. Experimentation of this type was more common for Great Printers than non-Great Printers.

- One-half (50%) of the Great Printers and just over one-third (35%) of the non-Great Printers were experimenting with ways to reduce their wastes.

Sometimes experimentation can backfire. The survey revealed that approximately one printer in seven (13%) had an experience where changes they made actually resulted in more waste or more toxic waste. Though a relatively uncommon occurrence, it was more common for the non-Great Printers (16%) than for Great Printers (7%).

## Experimentation

Some printers, including small operations, are constantly experimenting with new products.

*With alcohol substitutes, we just do one water bottle which sits on the press. Do that much, run the job and see right away if it's not working. Dump it. Go back to the old stuff. Which is what we've had to do.*

## Unanticipated consequences of experimentation

New technology does not automatically reduce waste. Sometimes technology results in an increase in wastes generated. At other times the new technology may be regarded as more toxic or hazardous than the one it replaced.

*Some technology is increasing our wastes. We went from a film based output to a plastic based output from our computers. Instead of generating a film that has a recoverable silver content, it's generating a plastic plate. That technology is upping the waste. It's not recoverable. The plastic sheet is all waste.*

*We've made all the changes to lower VOC chemicals and inks. We didn't really have any choice in the matter. You probably create more waste because every time you change one chemical in the chain, you've created something, somewhere. Someone had to run an extra 500 sheets because they couldn't get this straightened out. Until the adjustment is made.*

*You have to remix your fountain solution, or whatever. So now you've got more waste. Because you saved something here, you've got to throw out, and then you change your inks.*

Some think the new chemistries may be more toxic than the ones they replace.

*They come out with alcohol substitutes and everybody raved and thought it was the best thing since crackerjacks. But nobody stopped to look at what was in the alcohol substitutes. There were more carcinogens per pound in there than there were if you ran 25 percent alcohol.*

Some printers told us that cost can inhibit adoption.

*The thing is it's new technology. The cost is high. If we wait a little bit it will drop for us.*

*One of the things to be conscious of is that the printing industry is a very capital intensive business. That slows the progress of new technology because printers that have hundreds of thousands of dollars in presses and folders and stuff would like to dump that and go to electrostatics printing but the economics of it make it difficult.*

Change is also a function of scale.

*I don't think you're going to see the little printer making major changes. If you go to the larger houses, you'll see changes. Talk about direct to plate. There are savings there. Even though it's very expensive for them to do it. They won't have any film or any processors so you've eliminated a lot more waste. I don't think for us, the little printers, you'll see that for a long time.*

# Section IV: The Great Printers Project

Not surprisingly, non-Great Printers had much lower awareness of the Great Printers Project and could not recall receiving an invitation to join.

Though the Great Printers Project was initiated this same year, a significant number of printers said they were unaware of the Project and could not recall an invitation to join.

Table 6: Awareness of the Great Printers Project and recall of the invitation to join.

	GP	Non-GP	Total
Percent aware of the Great Printers Project	80%	28%	47%
Percent recalling the brochure inviting printers to join the Project	96%	25%	51%

**OBSERVATIONS:** The Great Printers Project has not penetrated the printing industry. Approximately half of the printers didn't know about the Project and didn't recall the invitation letter.

- Just over one-half (53%) of the printers were unaware of the Great Printers Project prior to receiving this questionnaire and a similar one-half (49%) did not recall receiving the brochure inviting printers to join the Project.
- As one might expect, prior awareness of the Project and recall of the invitation to join was significantly greater among the Great Printers.

Eighty percent of the Great Printers and only 28% on the non-Great Printers were aware of the Great Printers Project prior to receiving this questionnaire.

Nearly all (96%) of the Great Printers and only one-fourth (25%) on the non-Great Printers said they recalled receiving the brochure inviting printers to join the Project.

Printers joined the Great Printers Project because they hoped to learn how to better comply with environmental regulations, to learn how to manage their wastes better, and because they're concerned about the environment.

The incentive for joining the Great Printers Project was to become educated on environmental regulations, to learn better waste management practices, and because of a concern for the environment. Marketing and public relations were insignificant reasons for joining the Project.

Table 7: Reasons Great Printers offered for signing on as a Great Printer.

To learn how to better comply with environmental regulations	86%
To learn how to manage our wastes better	85%
Because we're concerned about the environment	81%
Because we already adhere to many of the Great Printer principles	76%
Because we want to be a good corporate citizen	72%
To learn about environmental management including waste reduction and pollution prevention	72%
To reduce disposal costs	71%
We were hoping for more information	71%
We wanted to advertise ourselves as a Great Printer	16%
So we can use the Great Printer logo to promote our products	14%

**OBSERVATIONS:** Great Printers are interested in learning how to better comply with environmental regulations. They are least interested in promoting the Project to their customers.

- More than eight Great Printers in 10 said they joined the Project to learn how to better comply with environmental regulations (86%), to learn how to manage their wastes better (85%), and because they're concerned about the environment (81%).

**NOTE:** Learning how to better comply with environmental regulations was cited as the "most important" reason for joining by 38% of the Great Printers. Concern for the environment was next most important at 16%.

- Printers also participated in the Project because: they were already adhering to many of the Great Printer principles (76%), they want to be good corporate citizens (72%), they want to learn about environmental management including waste reduction and pollution prevention (72%), they want to reduce disposal costs (71%), and because they were hoping for more information (71%).
- Reasons for joining the Project that were important to the fewest printers included the opportunities to advertise themselves as a Great Printer (16%) and so they could use the Great Printer logo to promote our products (14%).

Printers want to comply with environmental regulations.

*I think there is a real willingness to comply with regulations, to make sure our internal processes and functions are environmentally sound.*

Printers are concerned about the environment.

*I think it's self-evident. We all live in the world. We're all conscious of the environment and pollution concerns because we suffer from it like everybody else.*

*We would all like, if we knew how, to be good environmental producers of the goods of the business we're in. You've got a bunch of people who want to do the right thing and work with you. Show us how and we'll do it.*

*We all want to be ecologically oriented. Conscientious. We all want to do this. We know the environment needs it. We know that printers are a part of it.*

Printers already adhere to many of the Project principles and the Project makes good business sense.

Printers view the Project principles as simple, common sense. These are things that they would largely do anyway because they make business sense.

*I think we're pretty much doing this. Some of this stuff, we do because it makes sense economically as far as saving energy and that kind of thing. Reduction of waste. That just makes common sense.*

*This is something that I see as common sense. I'm going to maximize shop energy efficiency for profit reasons. I'm going to comply with environmental issues as best as humanly possible. I will exceed those requirements, in fact, if it's possible provided it's cost effective. If I see an area I can improve on, I will. So I don't see anything here that surprises me all that much. These are all things I would look at regardless.*

Printers want to be good corporate citizens.

*I think just the expectation of corporate citizenship. We pride ourselves on trying to provide a good environment for our employees to work in. We think it's consistent with the culture we'd like to pursue.*

*I think it's my obligation. I've always done well in this trade. It supports me and my family. I try to stay on top of my industry and support it any way I can. And I try to help the next guy coming along. That's one of the main reasons I signed up for it.*

Many printers were hoping to learn more information.

While printers agree with the goals of the Project some would like more information and education on how to attain those goals.

*The one thing I don't see here is anything pointing out educational issues. How to educate printers. How to seek information on some of these things. It's easy to say this is what you should do. But without the tools of how to do it, or where to find the resources to do it, that makes it a little more difficult.*

*When I got the brochure and signed up for it, my initial goal was that they would keep me better informed as to what was going on and give me more information on recycling and be a source where I could go if I needed help on this stuff. That was my basic goal for signing up.*

*We felt it was something to sign up for so that we could learn more about what to do and try to keep educating our employees on how to comply better.*

*I joined the Great Printers to help me learn. To help my employees learn. It struck me that it's a helping organization and we need help.*

*I look forward to someone coming in and looking at our situation and saying 'You're doing this wrong' or to tell us what to do to correct the situation. We may be doing things that are not correct and we don't want to. We want to correct. So that's another part of what I'm hoping to get.*

Printers will use their Great Printer status in promotions to customers.

*I'm enough of a businessman that I plan on hanging the certificate on my wall and trying to attract customers with it.*

*If you get to the point where someone makes a buying decision: 'Well they are a Great Printer and these other guys aren't, I'm going to take it over here.' You're going to find out we're going to be Great Printers.*

Although the Project has been slow to start, just over one Great Printer in three (36%) said they had already realized some direct benefit from participating in this Project. Of the Great Printers:

- 31% had received minor benefits.
- 5% had received major benefits.
- two-thirds (64%) however, said they had not realized any direct benefit from participating in the Project.

So far the Project has had little direct effect on the adoption of technologies. Printers did not mention the Project in their conversations as a reason to adopt a new technology or as a force in making them aware of new technologies. The principles embodied in the Project are principles that they are pursuing anyway. It is, at best, reinforcing printers' own impulses towards innovation and waste minimization.

*Here we're trying to do our part to be in compliance and make things better. Whether it was this that drove it, I don't really think so. We were working on it long before the Great Printers Project.*

*To me it's been relatively disappointing. I don't know what my expectations were of them. It sounded like we were going to be part of something that was pursuing this positive end result. Why not? It wasn't going to cost me anything. So long as we are kind of in line with what's going on, and their goals, why not?*

# Section V: Customer Demand for Environmentally Friendly Printing

Customer demand for environmentally friendly printing is primarily limited to uncoated and/or recycled paper.

Paper type, meaning uncoated or recycled, is the most common customer request for environmentally friendly printing. Requests for the use of unbleached paper, low or no-VOC chemicals, and recycled ink is almost unheard of.

Table 8: Frequency of customer requests for various environmentally friendly printing options.

	GP	Non-GP	Total
<b>Uncoated paper</b>			
Often	36%	35%	35%
Sometimes	26	31	30
Rarely/Never	38	34	35
<b>Recycled paper</b>			
Often	31%	26%	28%
Sometimes	53	53	54
Rarely/Never	16	21	19
<b>Soy or vegetable inks</b>			
Often	6%	3%	4%
Sometimes	36	24	29
Rarely/Never	58	73	67
<b>Unbleached paper</b>			
Often	4%	1%	2%
Sometimes	7	6	7
Rarely/Never	89	93	91
<b>Low or no-VOC chemicals</b>			
Often	0%	1%	1%
Sometimes	7	3	5
Rarely/Never	93	96	94
<b>Recycled ink</b>			
Often	0%	0%	0%
Sometimes	6	2	3
Rarely/Never	94	98	97

**OBSERVATIONS:** Beyond asking for uncoated and/or recycled paper, customers rarely ask for printing options which are friendly to the environment.

- Regardless of printer type, about one customer in three (35%) “often” asks for uncoated paper.
- Slightly more than one customer in four (26%) “often” asks for recycled paper. Note, however, that about four in five (82%) customers “often” or “sometimes” ask for recycled paper.
- Requests for soy or vegetable based ink is moderate at 33%. On the other hand, two customers in three (67%) “rarely” or “never” request these safer inks.
- Customer requests for the use of unbleached paper, low or no-VOC chemicals, and recycled ink is minimal at best; over 90% of customers “rarely” or “never” make such requests.

Interviews with printers substantiate the survey findings: there is some customer interest in “green” printing but it is not widespread.

*[Is there much demand for soy ink, for recycled paper?] I get virtually none from my standpoint. They want the job and they leave it up to me to pick the paper, pick the ink, pick the chemistry, and to pick the pressman.*

*I'd say in less than five percent of the jobs those [environmental concerns] even enters the conversations. There's awareness. People talk about it. They even have people price it. Then they see the cost differential.*

*In the beginning we had people come in and want recycled paper. Then when you said, 'It's 20 percent more,' they said, 'Oh, now we don't care for recycled paper anymore.' So it died. We do use it when we can but it's one of those things where money is the object.*

Some printers indicated that they now receive occasional requests for the use of vegetable based inks.

*There's a trend in inks. We're noticing it among our customers. They're asking for soy based inks more and more. I predict we're going to see growth in that area. Basically we're still using petroleum based inks.*

*We have a lot of people who request the soy-based inks. We do a lot of soy inks around here. We're pretty much changing over to soy inks. It makes the customer happy. They're asking for recycled paper. A lot of the paper nowadays is recycled. Some of the premium grades are recycled.*

Customer interest for recycled paper has increased during the past five years.

A sizeable minority of customers are expressing more of an interest in recycled paper today than five years ago. Somewhat surprising, however, is that a number of printers continue to see no interest or even less interest in recycled paper than they did five years ago.

Table 9: Change in customer interest in recycled paper over the past five years.

	GP	Non-GP	Total
Customers are more interested	42%	40%	40%
Customers show the same level of interest	33	36	35
Customers show less interest	19	21	21
Customers do not now and never have shown interest	6	4	5

OBSERVATIONS: Customers are more interested in recycled paper today than they were five years ago.

- Regardless of printer type, two printers in five (40%) said customer interest in recycled paper has increased.
- One printer in five (21%) said customer interest in recycled paper has actually decreased.
- One-third (35%) of the printers said customers show the same level of interest and only 5% of the printers said customers have never shown an interest in recycled paper.

*A lot of our customers are interested in recycled paper. Close to 90 percent. Even for people that don't ask these days, we mostly just get recycled paper. At least 50%.*

*One of the demands the public is putting on us is using recycled paper as opposed to a new sheet. We've had a lot of customers over the last couple years demand that we use a recycled stock.*

Although customer demand for recycled paper appears to be increasing, printers have quality and cost concerns regarding its use.

*When you look at running recycled paper we have some running issues, some quality issues. Our print job doesn't look as good. Today the expectation is quality. If you don't start with a good medium to work with, it affects your end product. It comes off looking muddy because you've got a non-white paper.*

*There are some concerns if you get into the lighter weight papers because the fibers are broken down further than the virgin sheet. You get a tendency to get the paper not be as stable. We have a little bit of problem with the lighter weights, they don't have the stability as a virgin sheet.*

*I'd say the majority of even good citizen corporate America isn't really chasing that [recycled paper]. Because it just isn't cost competitive today.*

The interviews also revealed that there are likely to be regional differences in the demand for recycled paper.

*Madison's more sensitive than any other part of the state on be environmental. I have friends in printing in Milwaukee and they don't want to use recycled and they don't want to do anything.*

Customers rarely, if at all, ask about a printer's operation, such as printing chemistry (low VOC inks) or equipment or techniques (electronic pre-press).

Regardless of printer type, few printers receive inquiries about their printing operation. One possible conclusion is that customers are uneducated about the printing process. With the exception of recycled and uncoated paper, customers do not know what questions to ask a printer about his/her operation.

Table 1O: Frequency of customer inquiries regarding a printer's operation.

	GP	Non-GP	Total
Often	4%	1%	2%
Sometimes	6	14	11
Rarely/Never	90	85	87

OBSERVATIONS: It's an unusual occurrence when a customer asks a printer about aspects of their printing process other than the availability of recycled or uncoated paper.

- Nearly nine printers in 10 (87%) said they rarely if ever receive a customer inquiry about their printing operation.

Hypothesizing that printers receive few inquiries from customers about their printing process, the survey asked printers if they now alert their customers to the opportunity for environmentally friendly print jobs. Results show that in the past year 38% of the printers have worked with customers to produce such jobs.

Working with the customer to produce environmentally friendly print jobs is more common for Great Printers: 44% of the Great Printers and 34% of the non-Great Printers have worked with customers in the past year.

The Project wants to stimulate dialogue between the consumer and the printer on the topic of printing practices. So far, however, there is little such dialogue.

*[Are you getting questions about cleaner printing from your customers?]*

*Not really. Not to my knowledge. They do the soy inks and the recycled paper quite a bit. After the paper and the ink they probably have no idea what happens.*

Only certain types of customers demand green printing.

*Mostly environmental groups. Environmental Decade. Ice Age Trail. A group up in Oshkosh. We always print on special paper for them. A grassy fiber similar to hemp. A non-pulp paper thing.*

*I find ad agencies are the ones where the purchase order comes through, and it must be on recycled, it must be soy ink. They're basically the only ones.*

*Businesses that have a problem with the public, they want people to know they're using recycled paper. Because they don't want to offend an environmental group. We get many customers who insist on it. They say, 'We don't care for ourselves, but geez, we've got touchy customers there and we got to have that on there.' So we're using more and more recycled paper because of the pressure that comes from the customers.*

Printers most commonly suggested to customers the use of paper with post-consumer recycled content to help produce environmentally friendly print jobs.

Of the printers which have offered suggestions to customers in the past year, the most common suggestions were the use of recycled paper, two-sided printing, and other changes to reduce paper use. Using re-blended ink as a way to help produce an environmentally clean print job was rarely suggested.

Table 11: Printers' suggestions to customers for environmentally friendly print jobs.

	(% of printers that offered suggestions)		
	GP	Non-GP	Total
Paper with post-consumer recycled content	79%	88%	85%
Two-sided printing	54%	74%	66%
Changes to reduce paper use	54%	68%	62%
Changes in coating, weight or color of paper	42%	44%	43%
Re-blended ink	4%	6%	5%

OBSERVATIONS: Printers are most likely to suggest the use of recycled paper, two-sided printing, and other changes to reduce paper use.

Of the printers which have worked with customers to produce environmentally friendly print jobs:

- More than eight printers in 10 (85%) have suggested the use of paper with post-consumer recycled content.  
Great Printers were somewhat less likely (79%) than non- Great Printers (88%) to do this.
- Two-thirds (66%) of the printers have suggested two-sided printing.  
This suggestion was made more frequently by non-Great Printers (74%) than by Great Printers (54%).
- More than three printers in five (62%) have suggested other changes to reduce paper use.  
Again this suggestion was made more frequently by non- Great Printers (68%) than by Great Printers (54%).

- Just over two printers in five (43%) have suggested changes in coating, weight or color of paper.
- Very few (5%) printers have suggested the use of re-blended ink.

# Section VI: Sources of Information

Suppliers are the most important sources of information to printers on waste management and on health and safety issues.

Printers rely on one another for information on waste management and on health and safety issues; suppliers, TSD's, people within their own company and fellow printers were primary information sources. Those employed at the Department of Natural Resources, the University Extension, and private consultants were considered important sources by a small minority of printers.

Table 12: Sources of information on waste management and on health and safety issues.

	(% very important)		
	GP	Non-GP	Total
Suppliers	61%	60%	61%
TSD's	49	29	36
People within your company	32%	32%	32%
Fellow printers	30	25	27
Trade journals	28	22	24
Trade associations	29	20	23
The DNR	24%	13%	17%
Private consultants	11	9	10
UW Extension	9	5	7
Craftsmen clubs	6	7	6

**OBSERVATIONS:** Printers rely primarily on suppliers for information on waste management as well as health and safety issues.

- Three printers in five (61%) said suppliers are “very important” sources of information on waste management.
- Secondary sources of information said to be “very important” included TSD’s (36%), people within their company (32%), other printers (27%), trade journals (24%), and trade associations (23%).

Great Printers (49%) were more likely than non-Great Printers (29%) to rely on TSD’s.

- Sources of information that were “very important” to less than one printer in five included the Department of Natural Resources (17%), private consultants (10%), UW Extension (7%), and craftsmen clubs (6%).

Great Printers (24%) were more likely than non-Great Printers (13%) to rely on the DNR.

In separate follow-up questions, suppliers were said to be the “best source” of information on waste management (32%) and on health and safety issues (36%). TSD’s were the second most important source for information on waste management (16%) and trade journals were the second most important source for information on health and safety issues (18%).

## Suppliers

*Our suppliers are very helpful. The salesman will come in to sell us a product. They'll usually bring a technical rep from the manufacturer to explain it and show what it's supposed to do for us. There's a lot of knowledge exchanged in this industry also.*

*The majority of product changes come about through vendors. If we get faced with a mandate because of some pending regulation it's, 'Hey, guys, you want to have our business you need to find a substitute for this product because it's going out of here.'*

*Salesmen. People calling us and bringing strange new ideas to us. We resist. They are a principal source of education for us. They will bring you right up to date. The thing that will trigger the most is they'll say: 'This other printer, your competitor, down the street, bought one.' Holy Christ! I can't pass that up.*

*Smaller printers don't have regular contacts with suppliers so they get less information.*

*That's the problem with being a small shop. You don't have a regular sales person that comes by. That can say what's new. So we have to go to shows.*

## TSD's

*Quite frankly the only source of information I have right now is guys like Safety Clean. They come through and they say, 'You're not pouring that excess coffee down the drain, are you?' They're like, 'I suppose it's okay but we can get you a nice filter for that and a big canister. When it's full we'll pick it up and dispose of it for \$300.' All of a sudden you're going ka-ching, ka-ching. I don't know if they're hosing me or not.*

## Trade journals

*We probably get eight or ten different trade magazines so we're always poking into that.*

*Magazines. A lot of magazines are available to us free of charge. 'Graphic Arts Monthly.' 'Instant Printer.' Virtually not a month goes by where there's not an article in every one of them that pertains to this type of situation. They're all free of charge. You just have to read them.*

## Trade shows

*We get most of our information from the trade shows. For instance, if we're going to look for a new piece of equipment or new chemistry, or if we're having a problem, we'll either look it up at the trade show or in the trade magazines. Then we'll talk extensively with the salespeople. They should know. They should be able to tell us why their product is better than Joe's down the street. How it's saving the world, how it's saving money. Is going to be running cleaner. That's how we shop for equipment. Suppliers also.*

Trade shows might be a way for the Project to reach people with waste minimization ideas.

*Trade shows and seminars is where you might be more effective. Especially for the little guys. That's when they have the time to linger. They got a day or two and can sit down.*

## Personal contacts

Some printers rely on other printers, sometimes in other locations, for information.

*California has always been the hottest one. When I go to different conventions I make friends with people from California. I have a question about something, I'll call somebody in California. 'What are they doing to you out there?' I can't sit on the Internet.*

*Every one of us has got a buddy. Someone we can talk more freely with in a compatible type company. With the same problems. Or what do you know about? And that's where we begin our search and go on from there.*

## Printers' associations

Printers also rely on craftsman's clubs for information.

*Another source of information is craftsman's clubs. We get together and talk and everything.*

*I have kept abreast of the industry, very simply, by knowing different local organizations like the craftsman's club, like the litho club, and so on. Because to sit down and read, there's not much time to do that. But I'll take two hours a month to go to the craftsman's club meeting here. Very inexpensive and you're in the room of companions where you all speak the same language and I have probably learned more going into these meetings than anywhere else. And I've been doing this for 20 years. It's the only way I can stay abreast of what's going on.*

*There are different organizations, you pick and choose the one that fits you. I go to the crafts organization because the theory behind that is 'share your knowledge.' It's more for the inside person: pressman, stripper, foreman. If you go to NAPL, that's geared for the presidents, the owners. PIA is driven more for the owners.*

NOTE: Printers did not mention the DNR nor University Extension as sources for information on waste management and on health and safety issues.

Great Printers are more likely than non-Great Printers to participate in large trade shows.

A printing trade show called Print 97/Converflex-USA was held in Chicago this past September. The survey asked if the respondent and/or other employees plan on attending the show. Results clearly document that a higher proportion of Great Printers plan on attending.

Table 13: Attendance at Print 97/Converflex-USA.

	GP	Non-GP	Total
Plan to attend Print 97/Converflex-USA	61%	29%	40%
Will other employees attend	75%	32%	47%
Debriefing meeting with employees after conference	36%	30%	33%

OBSERVATIONS: Employees of Great Printers are more likely than non-Great Printer employees to attend professional conferences.

- A majority of 61% of Great Printer survey respondents are likely to attend Print 97/Converflex-USA. Looking at non-Great Printers, less than half of that percentage (29%) are likely to attend the conference.
- Perhaps even more important is that three-fourths (75%) of the Great Printers allow other employees to attend the conference. In contrast, one-third (32%) of the non-Great Printers allow other employees to attend.
- About one-third (33%) of all printers hold meetings to debrief employees after such a conference, so that all employees can benefit, even if it's indirect, from new information.

The Great Printers Project stresses employee involvement and education. Printers share this emphasis. Employees often attend printing trade shows and are encouraged to participate in making decisions about new techniques or equipment. Printers recognize that such involvement is needed if the adoption process is to succeed. They also recognize that since the press operators have to work with the equipment they should be involved in making decisions about that equipment and printing chemistries.

*I think they are very much involved. First of all those are the people who have to work with it everyday. I can hear about the problem but they are in a better position to say this is how we should do it. You empower them to open up and let us know what you need. If it makes sense, sure. We rely a lot on our employees for suggestions.*

*Every three years there's a major print show in Chicago. We have 30 or 40 people go to that. They'll go down and see things running and see new ideas and be exposed to things that may be in transition. They bring it back.*

*We send people to trade shows. The big one is in Chicago. We probably send two people. A management person and a shop person to keep in touch with what's coming along the pike and what looks new. We try to stay abreast of changes like that.*

*We pay our people to go and charge them with certain things to look into while they're down there.*

After the trade shows participants debrief at the print shop.

*We usually sit down after the trade show and discuss some of the new things we've seen, the new technologies, the new processes. Because nobody can see everything at these trade shows.*

*The battle begins when the people come home. The pressmen come home licking their chops over these new multi-million dollar presses. 'My God, we got to have that.' We have a meeting. The full company gets together and the people that have gone down there describe these things in glowing color.*

Great Printers are more likely than non-Great Printers to believe that training in waste minimization and pollution prevention would be beneficial.

Given the above findings, it was not surprising to learn that Great Printers are more likely than non-Great Printers that they would benefit from waste minimization and pollution prevention training. As expected, the proportion of Great Printer employees that have already received such training exceeds the proportion of non-Great Printers.

Table 14: Percent of printers that believe they would benefit from waste minimization and pollution prevention training.

	GP	Non-GP	Total
Yes	73%	35%	50%
No	9	19	15
Unsure	18	46	35

OBSERVATIONS: Great Printers are more likely than non-Great Printers to believe they would benefit from waste minimization and pollution prevention training.

- Nearly three-fourths (73%) of the Great Printers compared to one-third (35%) of the non-Great Printers believe they would benefit from such training.
- Nearly one-half (46%) of the non-Great Printers are ambiguous; they're uncertain as to whether they would benefit from pollution prevention training.

The survey also asked if the respondent or any other employees have received such training in the past two years. Results indicate that more than one-half (53%) of the Great Printers have already received training in waste minimization and pollution. Only one non-Great Printer in six (17%) has already received such training.

Great Printers are somewhat more likely than non-Great Printers to be aware of and to have had contact with various outlets of information.

Printers that joined the Great Printers Project are more likely than non-Great Printers to have had contact with the University of Wisconsin-Extension's Solid and Hazardous Waste Education Center (SHWEC), and to have access to and to utilize the Internet. Very few printers are aware of the Printers' National Environmental Assistance Center (PNEAC) as a source of technical assistance for printers.

Table 15: Awareness of and contact with various information sources.

	GP	Non-GP	Total
Contact with SHWEC	52%	43%	50%
Connection to the Internet	64%	54%	59%
Browse the Internet looking for printing information			
Often	24%	14%	18%
Sometimes	38	24	30
Rarely/Never	38	62	52
Awareness of PNEAC	5%	4%	4%
If YES, ever browsed www.pneac.org	67%	0%	29%

**OBSERVATIONS:** Great Printers are somewhat more likely than non-Great Printers to have had contact with the University of Wisconsin-Extension, and to have access to and to browse the Internet.

- The University of Wisconsin-Extension's Solid and Hazardous Waste Education Center (SHWEC) has reached just over one-half (52%) of the Great Printers and 43% of the non-Great Printers.
- About two-thirds (64%) of the Great Printers and just over one-half (54%) of the non-Great Printers have a computer connection to the Internet.

- Great Printers surf the Net more so than do non-Great Printers looking for information related to printing; 62% of the Great Printers compared to 38% of the non-Great Printers look for printing information on the Internet.
- Practically no one is aware of the recently established Printers' National Environmental Assistance Center (PNEAC) as a source of technical assistance for printers. About one printer in 20 (4%) has heard of PNEAC.
- Of the small percentage of printers that are aware of PNEAC, Great Printers are more likely than non-Great Printers to visit the Internet site [www.pneac.org](http://www.pneac.org). None of the non-Great Printers have ever visited PNEAC's web site.

## SHWEC

Printers have a minimal familiarity with SHWEC.

*The university thing: I've never heard of it. They've never called me and I didn't know they existed.*

*That name is familiar. I think he spoke at a conference a couple years ago that I attended. The name sounds familiar.*

Printers mentioned that the cost of educational seminars and the required time away from their shop can prevent them from attending.

*I'm on their mailing list. Seems to me the seminars they have are pricey. The seminar is 40 or 50 dollars and takes less than half a day. It's probably worth my effort to go. But if it's 100 or 195 dollars, I'm probably not going to go.*

*Most small printers don't have a PR person, we wear many hats, we do everything. We attend the conferences, help in the shop, and estimate jobs. It's hard for people like us to have the manpower to go to these meetings and seminars.*

*It's not just the cost but the time away from work that's the killer.*

*It's hard for small printers to find the time to attend seminars.*

## Internet

Some printers we visited with did use the Internet but none of them were aware of the sites created in connection with the Great Printers Project.

*The National Association of Quick Printers is another. They have a site you can get onto. You can get in there and ask for different products, how other printers look at things, and what they're doing with things. Recycling is one of them. How do you dispose of this? What do you do with this?*

*The stuff I've gone after on the web is more for training. Take a look at NAPL and JTL. I scan some of the other ones.*

Trade magazines are providing printers with directions to web sites that may be of interest to them.

*The thing I'm seeing more of though, is in the trade magazines. You will find web addresses in with that. I found that to be very helpful in finding information. If I find something interesting in the trade magazine, and I want to look into it further, and they have a web site, I can do it right now. I can check out the web site immediately. Go direct from the magazine to the web site. Then I don't forget about it.*

Not all printers regard the Internet as a magic carpet for finding information that they can use.

*I find working on it to be quite a cumbersome process. And I can call someone up to get a piece of literature and read it a lot faster than I can go through and find a web site. If you know the exact web site you want you can go there fairly easily. But if you're trying to find some information on recycling, you get this list of 10,000 references. So it's real cumbersome.*

*I've got more valuable things to do with my time than to sit there and stare at that thing. Go from here to there to there to there. There's libraries, too. Do I go and sit in the library every night for five or six hours? No.*

Some printers said they did not have computers or did not use them to work on the net for information.

*We haven't used the Internet. I have it at home. Not in business.*

The Internet is more a tool for large printers than for small ones.

*You're looking at the wrong group [small printers]. You go to the big guys. Sure they have people sitting there, playing on the Internet. Because I know myself, I have the Internet and the only time I use it is after hours. Because I don't have the time to sit there and use it. I'm a small guy. I wear 25 different hats. I'm sure we all do the same thing. We have other problems.*

*There are printers out there doing ISO 9000. That's all they do. They [large printers] have the human resources. We don't. We're one man bands.*

*The time. The time. I can't envision telling a client, 'Well, your job won't be ready. I had to have my pressman go on the Internet or something like this.' I would just never use anything like this in my business. At least in the foreseeable future.*

*I can't envision the day when I would be able to sit on the Internet to check out what's environmentally friendly today.*

None of the printers we interviewed had heard of the PNEAC web site.

*There are probably 20 different printer sites that I visit on a regular basis. Just to see what's going on in other parts of the country as far as equipment reviews and things like that. [What do you regularly visit?] Print USA.*

*[You're on 20 or so web sites, is the PNEAC one that you're familiar with?]*

*No, it's not. [laughs]. They need to advertise it.*

Printing clubs and associations are more attractive to Great Printers than to non-Great Printers.

The Printing Industry of Wisconsin is the most popular among lithographic printers. The National Association of Printers and Lithographers is second. Few printers belong to craftsmen clubs, the Graphic Arts Technical Foundation, or a lithographic club.

Table 16: Membership in various printing associations and clubs.

	GP	Non-GP	Total
Printing Industry of Wisconsin (PIW)	40%	12%	23%
National Association of Printers and Lithographers (NAPL)	28	12	18
Craftsmen club	24	6	12
Graphic Arts Technical Foundation (GATF)	16	9	12
Litho club	2	2	2
I'm not affiliated with any	35	71	58

OBSERVATIONS: A majority of nearly three-fourths (71%) of non-Great Printers are not affiliated with any printing association or club while nearly two-thirds (65%) of the Great Printers are affiliated.

- The Printing Industry of Wisconsin is more attractive to Great Printers (40%) than non-Great Printers (12%).
- About one-quarter of the Great Printers are members of the National Association of Printers and Lithographers and craftsmen clubs.
- Overall, more than one-half (58%) of lithographic printers are not members of any printing association or club.

# Appendix 1: Summary of Data by Printer Size

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This appendix presents a summary of the survey data analyzed by printer size. Only significant differences between small printers (1 - 10 employees) and large printers (11 or more employees) are highlighted. To anticipate the detailed findings, many of the differences found between Great Printers and non-Great Printers can be explained by the size of the printing company. That is, large printers and small printers are more likely to behave in predicted ways.

## Waste and Regulatory Concerns

A higher proportion of large printers than small printers have major concerns with knowing which rules apply to them, having enough information on how to comply with environmental regulations, and keeping current with environmental rules.

Small printers expressed a greater concern than large printers for the potential liability for the hazardous wastes they generate.

Small printers were much more likely than large printers to say that they were concerned about the accumulation of small quantities of waste inks and oils and that they didn't have a safe or convenient means of disposing of them.

Large printers more so than small printers utilize TSD's for their management of waste. In particular, differences were found in the management of waste inks, wipes and rags, spent developer, spent fixer, blanket wash, and fountain solution.

## Waste Minimization

A higher proportion of large printers than small printers have made changes to their printing operations in order to reduce or at least keep their wastes in check. A significantly higher percentage of large printers have modified or substituted chemicals, modified their image-making or pre-press operations, modified their press operations, and implemented other operat-

ing practices to keep their wastes to a minimum.

As expected, large printers are experimenting with chemistries and procedures hoping to reduce their wastes more so than are small printers.

## The Great Printers Project

The Great Printers Project attracted large printers more so than small printers. Large printers were more likely than small printers to have heard of the Project prior to this survey, to recall receiving the brochure inviting them to join the Project, and to have sign up for the Great Printers Project.

A few differences for participating in the Project were found between large and small printers. Large printers were more interested in learning how to reduce their disposal costs, because they wanted to be good corporate citizens, and because they already practiced many of the Great Printer principles.

Small printers, more so than large printers, were hoping for more information.

## Customer Demand for Environmentally Friendly Printing

Small printers were slightly more likely than large printers to say that their customers rarely, if ever, request soy or vegetable inks, uncoated paper, or unbleached paper.

It follows that small printers were less likely than large printers to alert their customers to the opportunity for environmentally friendly print jobs.

## Sources of Information

The greatest number of differences between small and large printers was found in their sources of information. Large printers placed greater reliance on suppliers and vendors, TSD's, private consultants, and the DNR for information on waste management as well as for information on health and safety issues.

Large printers were much more likely than small printers to:

- plan attendance to Print 97/Converflex-USA;
- allow other employees to attend the conference;
- hold a debriefing meeting with employees after such a conference;

- believe that their employees would benefit from waste minimization and pollution prevention training;
- have received training in waste minimization and pollution prevention;
- have heard of SHWEC;
- have a computer connection to the Internet;
- have browsed the Internet looking for information related to printing;
- and to be a member of the Printing Industry of Wisconsin.

In addition, eighty percent of the small printers compared to 32% of the large printers are not affiliated with any printing association or club.