



*A Survey of Waste Management Practices in the
Fibreglass Boatbuilding Industry*

(Southwestern Nova Scotia)

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Survey of Waste Management Practices in the Boatbuilding Industry

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1. Introduction

The boat building industry is a major economic foundation in some Nova Scotia communities and is becoming a cornerstone for economic development and diversification in the region of southwestern Nova Scotia. The continued growth and prosperity of this sector is important. This fiberglass boatbuilding industry is a visible business in the southwest region of the province. This industry adds a lot of variety and diverse employment as well as many new experiences for this region. Hopefully, boat building will continue to grow and encourage more employment, new advances and live as long as the people.

Just as there are many components to managing a business, waste management and environmental protection are very important and need to be taken very seriously. Proper waste management can be a challenge for any business requiring commitment from business owners and managers and diligent action from all employees. While most businesses tend to focus on the challenges, the benefits of appropriate environmental protection activities are numerous such as reduced cost by incorporating pollution prevention approaches, improved corporate image, and improved relationship with the surrounding community.

Many boat builders have expressed frustration regarding the requirements for waste disposal and recycling. Waste management regulations administered by Nova Scotia Environment and Labour and subsequent requirements by Municipal governments have been enacted to increase the diversion of waste away from landfill sites and into recycling facilities. These changes have caused some confusion among the businesses and organizations involved in waste handling. Additionally, over several years Nova Scotia Environment and Labour have investigated several cases of open burning of waste at boatbuilding facilities, which is in contravention of provincial environmental legislation.

Furthermore, the requirement to meet new disposal site standards by December 31, 2005 under the Nova Scotia Solid Waste-Resource Management Strategy could increase the cost of disposal for the boat building sector. Municipalities that do not currently have disposal sites that meet the design criteria under the Municipal Solid Waste Landfill Guidelines will be required to upgrade their system or arrange to have waste taken to a facility that meets the criteria. Disposal costs in the form of tipping fees could increase and if distances to disposal sites are increased, transportation costs will also increase.

In order to begin addressing the issues and challenges, agencies involved with waste management agreed that a waste characterization for this industry sector was required. A survey and stakeholder interview process was initiated to gather the information. The characterization includes the identification of solid and hazardous wastes produced by this sector. Additionally, the survey queried business on their present waste management and pollution prevention practices. Another important component was the identification of waste disposal challenges being faced by industry and possible solutions to these issues. To assist the boat builders with the environmental aspects of their business, all participating boat builders were provided with the following documents: Reducin' Pollution, An Environmental, Health and Safety Guide for the Fibreglass Industry and Waste Check, Where Does My Waste Go? For the Industrial, Commercial, and Institutional Sectors.

Primarily, this report provides a compilation of the information provided by the fiberglass boatbuilding industry and waste management organizations in the municipalities of Digby, Argyle, and Yarmouth. As

well, some possible technological solutions to reduce the waste and recommendations for action are outlined.

The project sponsors involved in this eight week study include Waste Check, the Nova Scotia Boat Builders Association, Nova Scotia Youth Conservation Corps, and Nova Scotia Environment and Labour. The project sponsors will use the information gathered from this survey for the development of appropriate waste management and pollution prevention programs. Programs may include educational and technical assistance projects. Together we hope to have the boatbuilding industry as a partner in helping to create a better environment for us all.

2. Collection of Data

2.1 Methodology

In order to provide a complete and accurate report, the need to interview all parties involved with waste management was critical. The following organizations were included: boatbuilding companies, municipalities, landfill site operators, waste haulers and product suppliers to the boatbuilding industry.

The initial step for the collection of data was to identify the boatbuilding businesses in the geographic area of Yarmouth and Shelburne Counties. The Nova Scotia Boatbuilders Association provided a list of twenty-three facilities. The yellow pages of the local telephone book and business directories were reviewed and ten were added to the list.

An introductory letter from the project sponsors, explaining the objectives of the survey and encouraging participation, was sent to boatbuilding facilities. This letter is included in Appendix A.

After a few days to a week, the boatbuilding companies were contacted by telephone and visits to the shop were scheduled. If visits could not be scheduled, the business representatives were asked to complete the survey over the telephone. The site visits lasted from fifteen to forty five minutes and included an introduction and questions asked from the questionnaire, followed by a tour around the shop, and ending with a quick walk around the property. Every attempt was made to speak with the business owner; however, interviews were also completed with stock managers or an experienced employee.

Six municipal offices, two landfill operators, two construction and demolition debris sites, two waste haulers, and three suppliers were interviewed. The questionnaire used to interview these groups is included in Appendix B. The interviews were conducted by telephone. Contacting the municipalities was important because we wanted to know if they had been receiving any complaints or questions from the boat shops themselves or the general public. Also contacting the suppliers was vital because we were inquiring about the empty container return service some of the boat shops were mentioning and what exactly the supplier does take back, if there is a fee, etc. Contacting the waste haulers was important to our report as well. We needed a better understanding of the wastes they receive from the boat shops and what exactly they do with it, especially if it gets rejected at the landfill. Lastly, we contacted the landfills and Construction and Demolition Debris sites in Shelburne and Barrington, to find out about what wastes they receive from the boat shops and how this waste is managed.

2.2 Description of Survey Participants

Fibreglass Boatbuilding Industry

The fiberglass boat building industry manufacturer a variety of products ranging from traditional style fishing boats for the local market to pleasure craft exported to the United States and other countries around the world. The following quote from a press release issued by the Nova Scotia Department of Economic Development, dated July 21, 2004 indicates the importance of the industry in the province of Nova Scotia.

“Over the past five years, Nova Scotia’s boat building industry has added five hundred direct and spin off jobs to its work force, increased sales to \$80 million and captured new markets, particularly in the United States.”¹

¹ www.gov.ns.ca/econ/news/nr_view.asp?id=20040721001

The production of the boat shops involved in this survey varied. The facilities manufactured an average of six boats per year and employed an average of twelve employees. Most of the companies manufacture fishing vessels and approximately half of the shops (11) manufacture yachts as well.

Environmental aspects in the fibreglass boatbuilding industry include solid waste, hazardous materials, air emissions, and liquid effluents. For instance, significant quantities of solid waste are produced: cardboard, wood, fibreglass pieces. Additionally boatbuilding facilities use hazardous materials such as resins, hardeners, and acetone in their process and wastes from these materials require proper handling and management.

Municipalities

Municipalities in Nova Scotia are tasked with the development and delivery of waste management plans in their geographic region under Nova Scotia’s Solid Waste-Resource Management Regulations. The Municipalities participating in this survey included the Municipality of Yarmouth, Town of Clark’s Harbour, Municipality of Digby, Town of Digby, and Municipality of Clare.

Waste Haulers

Waste haulers refer to companies transporting community waste to a local landfill, construction and demolition disposal sites, recycling depots or other locations. These haulers also collect waste from businesses including fibreglass boat shops.

Suppliers to the Boatbuilding Industry

Suppliers refer to companies that supply products, such as gel coats, resins, and solvents to the fibreglass boat shops.

3. Survey Results

3.1 Waste Characterization

The boat builders were very willing to participate. We found a total of thirty-three boat shops in the region and twenty-three accepted our invitation to participate. Of the ten that did not participate, six chose not to participate, two could not be contacted and two were unable to set a date within the time allotted. We also conducted one survey over the phone due to their busy schedule.

The participating companies provided the following information regarding types of waste produced by the boatbuilding facilities and disposal practices. Table 1 is a summary of this information. The quantities of waste material were not available.

Waste fiberglass reinforced plastic (FRP) is quite common, but small in amount. The waste is the excess fiberglass material that is trimmed from fiberglass components or material cut away to make holes in the hull.

Fiberglass fabrics are rarely disposed of because these fabrics are very expensive. Pieces of leftover fabric are reused when possible. They use these to patch and repair small sections of the boat. Many times these pieces end up in the keel. The average quantity left over fluctuates from shop to shop but most shops only had a small amount left over, ranging from a few pieces to a small box full.

Cardboard was found at most boat shops. Packaging cardboard was often reused in the shop to capture the over-spray of resin, paint, and gel coat. A few shops purchased new cardboard for this purpose as well. Some of the waste cardboard from the boat shops is clean and some is contaminated from the over-spray process. Both haulers who were interviewed estimated that 20-50% of the waste from the boat shops that they receive is cardboard.

Waste wood was very common at all the boat shops. The wood scraps were used for firewood or used for small projects such as birdhouses. Scrap wood is generated from building components for the boats. One waste hauler and one landfill site operator estimated that 80% of the waste from boat shops is wood (clean and contaminated). The only pressure treated wood they had was the wood they treated themselves. Rarely was there any waste pressure treated wood because they only treated what they needed.

One of the waste materials most commonly found at the boat shops was **metal**. Waste metal is generated from a range of activities including fabrication of fittings, brackets, rudders and similar components. Disposal of scrap metal is not a major problem since most of it is sold to a local metal collector.

Plastic foam is used in many boat shops as a core material in fiberglass hulls. Waste pieces of foam are generated when the foam is cut and trimmed.

Acetone is a common solvent found at boat shops, which is used for cleaning tools. Many boatbuilding facilities indicated that they did not have any waste acetone because it evaporated. Two facilities recycled their acetone on site by using an acetone distillation unit. Others indicated that the waste acetone is returned to the supplier.

Paint is used at almost every boat shop. What little is left after painting the boat is usually mixed together to be used again on another boat. The cans with residual product are either sent to the landfill or the recycling depot.

Resins and gel coats are used and when the containers become empty (45 gallons drums) they are then taken back by the supplier. Resin and gel coat products may become waste if entire contents of a container are not used or if the product date has expired.

Products and materials used in the boat building industry are shipped in various types of **containers**, such as resin and acetone in 45 gallon drums, gel coats in 5 gallon plastic jugs, paint in 1 to 5 gallon cans, and contact adhesives in pressurized containers. After the product is used, residual product remains in the containers. The 45 gallon drums may be tipped and left to drain as much product from them as possible.

Many of the boat shops did not have significant quantities of waste **plastic or styrofoam**. The only scraps they might have left are from the packaging that materials come shipped in.

Rollers are used at most boat shops for the application of paint, gel coat, and resin. The used rollers are disposed of as a waste material.

Gloves and rags are used for many processes in the boat shop and become contaminated with a variety of materials such as paints, resins, oils, etc. In most cases they are disposed of with other general waste materials.

In the boat shops there was no glass waste. All the glass that was needed was manufactured outside the shop and brought in. So there were no waste trimmings from these items.

Out of twenty-three boat shops we visited only two had green bins for organic waste and one shop used their green bin for garbage. This was not a major issue for the boat shops because many of the boat shops didn't have a lot workers and the only food that was there was what they brought in.

3.2 Present Waste Handling and Disposal Practices

A variety of waste handling and disposal practices were employed. The following is a general description of these processes.

Most facilities place their waste material into a dumpster that is picked up by a professional waste hauling company while others transport the waste themselves. Materials such as empty jugs, FRP scraps, gloves, rags, rollers, plastic and foam, cardboard and wood is taken to landfill sites for disposal. Some wood is taken to construction and demolition debris sites. Some cardboard is taken to the local recycling depot. For the most part however it appears that clean and contaminated cardboard and wood is not separated and most is taken to the landfill site.

Three boat shops stated that they burned their waste, while a few others refused to admit it, even though there were clear signs observed during the site tours. Burn piles consisted of garbage and waste from the boatbuilding process (ie. wood, paper, rollers). Some boat builders reported that local residents would place their domestic garbage in the burn piles without the permission of the boat builder. A variety of

wood burning equipment was utilized such as a home-made steel burner and small manufactured furnaces (found in 6 shops).

The three suppliers for this industry sector, who were interviewed, offer a return service for empty containers to their customers. The 45 gallon steel drums that contained resin and acetone are usually taken back by the supplier. Some suppliers charge a deposit on containers and others did not. These drums usually had to be cleaned, which was done by leaving the cover off and tipping them on their side. The drums could not be returned if they were damaged (ie. holes/punctures). A few boat builders indicated that the suppliers only provide this service to large volume customers. The three suppliers estimated that 30%, 40%, and 80% of their customers use the service. Two suppliers indicated that they sell the returned drums to a recycler and one supplier indicated that they are shipped somewhere else.

The smaller containers (5 gallons or less) are not recycled and are disposed of at the landfill site. Many boat shops did not separate their domestic recyclable materials from their process waste. Containers, cans, bottles, and food waste from kitchen facilities were thrown into the waste dumpsters.

Most boat shops try to reuse some of their waste materials and as such divert it away from landfill disposal. For instance left-over fiberglass fabrics are generally reused in the manufacturing process. Many boat builders sell their scrap metal to a scrap metal dealer and give scrap wood to residents in the community.

Some boat shops are employing pollution prevention practices. Two boat shops used acetone recycling equipment to filter their used solvent. The filtered solvent is reused.

Table 1 - Survey Summary		
Characterization of Waste from Fibreglass Boatbuilding Industry		
Waste Type	Process Generating Waste	Present Waste Handling
Containers - steel drums (45 gallons) with residual resin - steel drums (45gallons) with residual acetone - plastic (5gallons) with residual gel coat - paint cans (1-5 gallons) with residual paint - pressurized contact adhesive containers	- complete use of products in the manufacturing process; residual product left in containers if it is not cleaned out	-45gallon drums (resin/acetone): supplier takes back if in good condition and drained -5gallon plastic containers are sent to landfill site. -paint cans (1-5gallons) are sent to landfill or recycle depot - pressurized contact adhesive containers – stored at boat shop site because not accepted at landfill sites; one boat builder takes containers to construction and demolition debris site.
Waste resin and gel coat	- waste is generated if entire contents of container is not used. - time-expired product	- landfill site if product is hardened.
Waste paint	- waste is generated if entire contents of container is not used	- landfill site or recycling depot
Waste acetone	- process of cleaning tools contaminates acetone	- evaporation (leave cover off container) - 3 shops recycle and reuse - return to supplier
Waste hardeners / promoters (only a few shops utilize hardeners)	- if entire contents of container is not used	- hardeners mixed with waste resins (harden product to landfill site) - unmixed hardener is hazardous material
Fibreglass and reinforced plastic scraps / dust	- trimmings and cuttings from the hull and other components	- landfill site
Clean cardboard Cardboard contaminated with resin, paint, and gel coat	- packaging material; some shops purchased cardboard - used to capture over-spray of resins, paint, and gel coat - used as a working surface for the application of resin to fabric	- most cardboard (clean and contaminated) to landfill site - some clean cardboard to recycling depot
Wood	-scrap from building boat components - wood shipping pallets	- reused / burned - landfill site - construction & demolition debris site
Styrofoam / plastic	-packaging materials	- most to landfill site - some to recycling depot
Plastic Foam	- core trimmings	- landfill site
Metal	-from variety of activities including fabrication of fittings, brackets, rudders, and similar components.	- local metal salvage - construction & demolition debris site
Rollers	-used rollers from application of paint, gel coat, and resin	- landfill site
Gloves & rags	- boatbuilding process	- landfill site
Domestic waste	- from lunchroom /washroom	- not separated - landfill site

3.3 Waste Disposal Challenges

Boatbuilding Industry

During the survey the representatives from the boatbuilding companies mentioned the following waste handling and disposal challenges.

- Almost 70% of the participating companies are having some difficulties with disposal of waste. They are having difficulty with the following materials: fiberglass and fiberglass reinforced plastic (5 companies), contact adhesive containers (4 companies), cardboard (3 companies), resin (3 companies), resin drums (2 companies), wood (2 companies), foam (2 companies), gel coat containers (2 companies).
- One of the main disposal challenges that the boat builders seem to face is getting rid of some of their waste materials, such as used cardboard contaminated with fiberglass and resin. Clean cardboard is to be taken to the recycling depot; however, if the cardboard is contaminated the recycling depot cannot accept it. The contaminated cardboard should be taken to the landfill site for disposal; however, it appears that landfill operators have turned this material away in their efforts to send all recyclable material to the recycling depot. There may also be some difficulties with mixed loads of contaminated and clean cardboard in that some operators of the landfill site and the recycling depot may have varying tolerances for mixed loads. The end result is confusion and frustration.
- Some boat builders (4 of 20 participating companies) have expressed difficulties in disposing of contact adhesive pressurized containers. One boat builder indicated that the construction and demolition debris site in Barrington would accept these containers.
- Some boat builders expressed frustration with the operation of landfill facilities, more specifically the differences in the types of materials that various landfill sites will accept. The perception is that boat builders who take waste to the Clare landfill have less trouble than those utilizing the Yarmouth landfill site. Interestingly, however, no boat building facilities or waste haulers mentioned that their loads had been rejected at either facility.
- Some boat builders stated that the cost and inconvenience of separating, transporting, and disposing of waste are issues.
- Some boat builders from smaller facilities stated that is a hassle to have to sort out all their waste and educate their employees on how to separate, as well some said they did not have the time to spend on separating.
- Furthermore, some boat builders said it was a big expense having to have someone pick up their waste or to transport it themselves, costing them money for gas, costs at the landfill itself and as well taking time out from their business. One boat builder estimated that transportation and disposal costs were approximately \$200 per load.
- Some of the smaller businesses stated that they have a hard enough time just getting by and it is a great inconvenience to pay any amount of money to have their garbage picked up, or even brought to the landfill themselves.
- To overcome the abovementioned challenges, some boat builders burned their waste, which is in contravention of provincial environmental legislation.
- One boat builder stated that there was no landfill or construction and demolition debris site in the

near vicinity.

Suppliers

The following comments were received in reference to the empty container return service. One supplier stated that they would only accept empty drums and other containers from larger shops, because they were the ones who consumed large enough quantities to bother with. Because smaller shops don't consume as much so the suppliers might lose money shipping the drums off.

In general the boat builders did not have problems with the suppliers, only a couple of the shops mentioned the suppliers sometimes giving them a difficult time when returning their drums. They especially had problems if it was a smaller shop and they only had a few drums to return, the supplier might skip them altogether and move on to a larger shop where they were returning a larger number of drums.

Municipalities

Several municipalities were contacted and discussions were inconclusive. Only one of them seemed to have any problems with regards to waste generated by boat builders but did not detail the problems. They had been receiving telephone calls from many boat builders to discuss waste disposal options.

Other Organizations

There did not seem to be any problems from other organizations dealing with waste disposal at boat shops. The only other people seeming to have any problems with the burning were the surrounding communities.

3.4 Potential Solutions

Potential solutions for the waste handling and disposal issues were sought during the surveys with the boatbuilding industry and conversations with other organizations. The following ideas were expressed; however, further investigation and study would be required to determine if these ideas are feasible:

- Provision of training for boat shop owners and employees. Several potential topics were mentioned: proper separation of waste and recyclables; environmental legislation.
- Utilize acetone-recycling units. Establishing a solvent recycling program in the region providing all boat shops in the region with access to recycling equipment.
- Develop a drum collection area for smaller shops. These shops could then participate in the drum return service provided by the suppliers.
- Re-use empty drums for buoys for lobster pots.
- Investigate disposal site options.
- Find an alternative to the cardboard being used as a working surface to apply resin on the fiberglass fabric.

3.5 General Information and Observations

This section outlines additional information and general conclusions as a result of conversations and information gathered during the survey:

- Approximately 65% of boat builders stated that they are working on environmental improvements such as separation of materials for recycling or reusing.
- Larger shops appeared to show more concern towards their waste and where it goes. We assume this is because shops with more money feel they are more able to do something about it whereas the lower income shops don't necessarily have the money/income to spend on waste disposal. According to one boat shop, if you have money you can get rid of anything
- Another question we asked was where these shops get their information on proper methods of waste disposal. Many of them said the suppliers are a big help with sessions on hazardous waste and that the Nova Scotia Boatbuilders Association also held educational seminars and a couple of the shops simply learned from what the haulers told them. Government agencies were not mentioned.
- Many of the dumpsters contained a variety of waste, which was not sorted. Many of the boat shops stated that they did not want to be bothered with sorting their waste.
- A lot of the smaller shops were worried about continuing restrictions and how it will affect their business.
- A few shops had cleaned up after the previous owners, which may indicate that there is more concern for the environment than there was years ago.
- A majority (16 of 22, or 70%) of the boatbuilding representatives expressed an interest in attending information sessions or training sessions related to environmental issues. The boat builders mentioned the following possible topics: cut down amount of waste to save money, environmental legislation, proper waste disposal, session introducing the Reducin' Pollution Workbook, techniques to reduce environmental impact. The boat builders who were not interested in attending any sessions provided the following reasons: they knew most of it already, did not care, and one stated he was getting too old to bother.
- Almost 40% (9 of 21) of the participating companies feel that they have a good understanding of environmental legislation that pertains to their business and 30% have some knowledge.
- A majority (14 of 17, or 82%) of companies expressed a willingness to use the guides ("Reducin' Pollution , An Environmental Health and Safety Guide for the Fibreglass Industry" and Waste Check, Where Does My Waste Go?). These guides were provided to each of the participating boatbuilding facilities at the end of our visits, with the exception of six, which were mailed.

4. Conclusion

The survey results indicate that a majority of boat builders care about the waste problems and want something done. Many of them would like to see solutions and places for their waste to go. The boat builders and other stakeholders provided some suggestions and ideas to improve the present waste management practices.

Even long after our research, the boat building industry will continue to thrive. New advances will continue to flourish and to improve the economy. Hopefully, our research will influence some positive improvements and overall good community cooperation.

5. Recommendations

The boat building industry has the same responsibilities as everyone else in the province and that is to be an active participant in the effort to make our environment cleaner. The following recommendations are intended for review and consideration by all stakeholders including, but not limited to, boat builders, municipalities, Waste Check, and Nova Scotia Environment and Labour.

- The industry needs more education on separating waste and a place to call in order to get information on how to dispose of their waste properly.
- Municipalities and the regional waste authority should be more knowledgeable about the wastes being created at the boat shops and the processes that generate the waste. This information will assist them in providing appropriate waste disposal and recycling information. They should meet with the boatbuilders to discuss upcoming changes to legislation.
- Promote pollution prevention techniques to the boat builders in order to reduce the amount of waste being produced and reduce their waste disposal costs. This approach may help mitigate the effects of new legislated requirements for disposal sites coming into effect in 2006.
- Boat builders should be encouraged to work with suppliers and local metal salvage dealers to increase the number of containers being recycled.
- Investigate the possibility of establishing an “acetone recycling center” that can be used by boat shops in the area.
- Boat builders in other parts of the province should be made aware of this report and be given a copy of *Reducin’ Pollution, An Environmental Health and Safety Guide for the Fibreglass Industry*.

6. Acknowledgments

The Nova Scotia Youth Conservation Corps, Waste Check, Nova Scotia Boatbuilders Association, and Nova Scotia Environment and Labour would like to thank all those who took the time to participate in the survey. They sincerely appreciate your input in allowing us to come up with an accurate report.

Boatbuilding Industry

- A.F. Theriault & Son
- Apple Island Marine
- Aylward Fiberglass Inc.
- Browett Boat Builders
- Bruce M. Atkinson Boat Builders
- C.G. Atwood Boat Shop Ltd.
- Cape St. Mary Boat Builders
- Cottreau Boats
- Daniel's Head Boatbuilders Ltd.
- D'Eon Boatbuilders
- Dixon's Marine Group 2000
- Greg Symonds Boatbuilders Ltd.
- James E. d'Entremont Boatbuilders
- Leblanc Brothers Boatbuilders
- Malone's Boat Repair
- McGray's Boat Building
- Oceanside Boats
- R. Belliveau Boatbuilding
- Roy M. Doucette Boatbuilders
- Sea Pride Boat Works
- Top of the Mooring
- Wedgeport Boats
- W. Spinney Boats Ltd.

Product Suppliers

- Ashland Canada FRP Supply
- East Coast Fibre Glass
- OP Fibreglass

Waste Haulers

- Clare Landscaping
- Dennis Thimot
- Duffus Remove-All Ltd.
- Shannon Newell
- Sou'West Sanitation

Municipalities

- Municipality of Clare
- Municipality of Digby
- Municipality of Yarmouth
- Town of Clark's Harbour
- Town of Digby

APPENDIX A

Introductory Letter

June 15, 2004

Dear Boatbuilding Professional;

Nova Scotia is recognized as a world leader in Waste Reduction. It is important to remember that as a part of its commitment to Waste Reduction, Nova Scotia has progressive Solid Waste Legislation. This law requires that businesses like yours have programs in place to deal with materials that have been banned from the landfill. As you are likely aware, this requirement to separate waste and the complete ban on the burning of solid waste has created challenges for some boat shops.

I am pleased to inform you that Waste Check, Nova Scotia Environment and Labour, and the Nova Scotia Boatbuilders Association have joined forces to conduct a study on the types of waste generated by the boatbuilding industry. The main purpose of the study is to ask the boatbuilding industry what challenges they are facing and to complete a waste characterization study. This information will be used to help the industry and government find cost effective ways to comply with Nova Scotia's solid waste regulations and to identify ways to reduce the quantity of waste produced.

The project will be conducted by the Nova Scotia Youth Conservation Corp who will be calling you in the next couple of weeks to ask you for your participation in a survey and site visit.

If you have any questions or concerns about the project, or would like to ensure that your shop is included, please contact the undersigned at 1 800 569 0039.

Sincerely;

Gus Green
General Manager
Waste Check

APPENDIX B

Questionnaires

Survey of Waste Management Practices in the Boatbuilding Industry

Introduction

Hello, my name is _____ and I am working with the Nova Scotia Youth Corps, a student employment and skills development program. The project we are working on is a Survey of the Waste Management Practices in the Boatbuilding Industry. Our partners are interested in helping the boatbuilding industry overcome the challenges you face in dealing with your waste. We are tackling the first step in this initiative, asking businesses for their ideas and getting a better handle of what types of waste you are dealing with.

We would like to set up an appointment to visit you in order to complete a survey. The survey includes questions related to the types and amounts of waste being produced, what happens to the waste, and what problems are being encountered. The information you provide will be compiled with the information gathered from other boatbuilders and will be included in a report. Your name and company name can remain confidential. The findings will assist organizations involved in waste management for this region and will assist in the determination of future information sessions and programs.

Our partners in this project include:

- Waste Check, Yarmouth
- Nova Scotia Boatbuilders Association
- Nova Scotia Environment and Labour
- Nova Scotia Composites Environmental, Health and Safety Working Group

Our phone number isif you would like to contact us in the future.

Questionnaire

1. Your name and company name will not be linked to the information that you provide to us. We would however like to acknowledge your company as having participated in the survey. We will do this by thanking the participants in the report. If you would rather not have your name mentioned at all, we will not include it.
2. Please describe your business.

# of Employees	Year business established	Products produced	Annual production	Processes Used	Other / comments

2. Waste Characterization and Waste Management Practises for Solid and Hazardous Waste

Waste (description)	What process(es) creates the waste	Quantity /Annum (estimate or actual)	Waste management practises (on-site recycling, off-site recycling, landfill, burning, dumping)	Comments
Paint				
Resins				
Hardeners / promoters				
Acetone / solvents				
Other chemicals				
FRP scraps, cuttings, dust				
Scraps of fibreglass fabrics				
Plastic / Foam				
Wood				
Pressure treated wood				
Metals				
Glass				
Cardboard and other packaging materials				
Domestic garbage (lunchrooms, etc.)				
Other materials				

3. Are you currently working on environmental improvements in your facility?

4. Are there particular waste streams that are creating difficulties for your business? Why is it a problem (cost, acceptability of material, etc.)

5. Would you be interested in attending information or training sessions related to environmental issues?

Yes ___ No ___

If yes, what topics would you like to hear about.

Possible sessions include:

- Proper waste disposal (hazardous waste and solid waste) _____
- Environmental legislation _____

- How you can reduce the amount of waste you produce and save money _____
- New techniques in the industry that will reduce your environmental impact _____
- Information session introducing the Reducin' Pollution Workbook (specifically designed for the fibreglass shop) _____

6. Do you have any comments related to environmental improvements or concerns? Can you suggest any possible solutions or ideas?

7. Do you feel you have a good understanding of the environmental legislation that pretains to your business? Please elaborate, if you wish?

Could you show us your facility so we can take a look at some of the wastes that we have spoken about and the environmental improvements that you are working on. We'll be taking a few notes as we go. Is it OK to take photos of the waste and waste containers.

Observations During Walk Through

Containers or Dumpsters inside the facility & in the yard.	General Location	Contents	Label	Comments

Other observations (may include: poor housekeeping such as a messy shop, evidence of spills, separation of different waste materials to allow for proper disposal, reuse or recycling practises, evidence of burning waste or disposal of waste on property, hazardous materials storage area with secondary containment, hazardous materials used or stored next to floor drains, etc.)

Do you have a copy of Reducin' Pollution, An Environmental Health and Safety Guide for the Fibreglass Industry? Yes ___ No ___

For NSYCC student. Please indicate if a copy is left with the company. Yes ___ No ____. Note any comments from the company representing an initial reaction to the guide (eg. "good idea", "I'll never read it").

Survey of Waste Management Practices in the Boatbuilding Industry Questionnaire for Suppliers

(Italicized text is for explanation, it is not part of the question.)

1. Do you sell products to the fibreglass boatbuilding industry? Yes ____ No ____

(If no, thank them very much but the following questions would not apply to them.)

If yes, what do you sell to them?

2. Do you take back any product that they don't use? Yes ____ No ____

Do you take back any product that has gone bad? Yes ____ No ____

Do you take back empty containers? Yes ____ No ____

Is there anything else you take back from your customers?

What does your company do with these items?

(I would expect that you will be speaking with distributors and they send everything back to the manufacturer.)

3. What percentage of your boat building customers return empty containers and other materials to your company? _____

(If not 100%) Do you know why some of your customers don't use this service?

4. Are there certain things that the boatbuilder needs to do in order to use this service? *(I expect the answer will be....keep the drums in good condition...)*

5. Have you encountered any problems associated with the take-back service? If yes, what are the difficulties?

6. *(If the company does not offer a take-back service ask...)* Do you mind if I ask why your company does not offer a take back service?

7. Do boatbuilders call you and ask for advice on how to dispose of empty containers or excess product? Yes ____ No ____ . If yes, what do you tell them?

Survey of Waste Management Practices in the Boatbuilding Industry
Questionnaire for Municipalities

Introduction

Questions

(Italicized text is for explanation, it is not part of the question.)

- 1. Is the Municipality facing any challenges in relation to waste and recyclable materials from the boatbuilding industry? If so, what are the challenges?

- 2. Are you receiving calls from the boatbuilding industry regarding their waste? If so, what is the nature of the calls and how often do you receive these types of calls. (*Possible answer may be to complain about landfill site operator, too expensive, asking how to get rid of certain materials.*)

- 3. Do you receive calls from other organizations or the public regarding waste disposal practises of boatbuilders? If so, what is the nature of the calls and how often do you receive them. (Possible answers may be that a boatbuilder is burning its waste.)

- 4. Do you have any suggestions on how to improve or remedy challenges associated with waste and recyclable materials from the boatbuilding industry?

**Survey of Waste Management Practices in the Boatbuilding Industry
Questionnaire for Municipal Land fill Operators**

(Italicized text is for explanation, it is not part of the question.)

1. How much waste do you receive from boatbuilding shops? (*I would assume that they will give you # of loads on a daily or weekly basis, make note of the time frame. They may give you a quantity or # of loads. If it is # of load's, ask them how large the containers are or type of container, this will give us a better idea of quantities.*)

2. What types of waste are received from boatbuilding shops?

3. Can you give us an idea of the amount of each type of waste is found in a typical load from a boat shop? (*An answer may be: 30% is wood; about 50% dirty cardboard; 10% fibreglass pieces; 5% drums and containers*)

4. Have you ever turned loads away? If so why?

5. Can you give us an idea of how many you may turn away? (*Could be a percentage of the total loads received from boatbuilding shops.*) _____

6. Do you every receive any hazardous waste from boatbuilding shops? If so what is it and how often does this happen?

7. Have you received any calls from boatbuilders regarding problems getting rid of their waste, asking advise on what is recyclable, asking for suggestions on how to improve their loads of waste? (*Please include the comments, not just a yes / no answer*)

8. Do you have any suggestions for boatbuilding shops regarding their waste loads? (*Possible answers may be separation of waste from recyclables*)

9. Do you have any suggestions on how to improve or remedy challenges associated with waste and recyclable materials from the boatbuilding industry?

APPENDIX C

Summary of Collected Information/Data

Survey of Waste Management Practices in the FRP Boatbuilding Industry
 Summary of Data Collecting during July and August 2004

Table 1 : Data collected from 23 boat builders (22 boat builders were surveyed at their facility and one boat builder interviewed by telephone).

Topic	Question / Details	Data
1. Company Information	How many employees? • 1-10 employees • 10-50 employees • 50 - 100 employees • 100-150 employees	Range 1-150 employees • 13 companies (56%) • 8 companies (35%) • 0 companies • 2 companies (9%)
	Years in Operation? • < 10 years • 10-50 years • 50 -100 years	Range 1-100 years • 6 companies (26%) • 12 companies (52%) • 5 companies (22%)
	Products Produced? • fishing boats • pleasure boats / yachts • fishing and pleasure boats • other (eg. molds, everything , all, many)	• 11 companies (48%) • 2 companies (8%) • 5 companies (22%) • 5 companies (22%)
2. Waste Characterization	Boat builders were asked the following: • Types of waste generated • What process(es) creates the waste? • Quantity per annum? • Waste management practices?	• # of companies indicating that they produce this type of waste • not included - survey inconclusive • not included - survey inconclusive • # of companies employing specific waste management practice
	1. Waste paint /containers	• 20 companies (refers to either waste product or containers or both) • waste management practice - return to supplier - 1 company - landfill site / haulers - 7 companies - re-use / envirodepot / paint swap - 5 companies
	2. Waste resin / containers	• 17 companies (refers to either waste product or containers or both) • waste management practice - return to supplier - 12 companies - landfill site - 1 company - re-use / in yard - 4 companies
	3. Waste hardeners / promoters / containers	• 13 companies (refers to either waste product or containers or both) • waste management practice - return to supplier - 1 company - landfill site- 10 companies - reuse / drain - 2 companies

4. Solvent / acetone	<ul style="list-style-type: none"> • 17 companies (refers to either waste product or containers or both) • waste management practice - return to supplier - 8 companies - on-site recycling - 3 companies - evaporate / burn - 6 companies - reducing use - 1 company
5. Other chemicals	<ul style="list-style-type: none"> • 1 company (oil)
6. FRP Scraps, cuttings, dust	<ul style="list-style-type: none"> • 17 companies • waste management practice - landfill site - 12 companies - construction & demolition debris site - 1 - re-use - 4 companies - burn - 1 company
7. Fibreglass Fabric	<ul style="list-style-type: none"> • 18 companies • waste management practice - landfill site - 9 companies - re-use - 5 companies - burn - 2 companies - construction site - 1 company
8. Plastic / Foam	<ul style="list-style-type: none"> • 19 companies • waste management practice - landfill site - 11 companies - re-use - 1 company - recycle - 1 company - burn - 1 company
9. Wood Preservative treated wood	<ul style="list-style-type: none"> • 19 companies • waste management practice - landfill site - 7 companies - reused off site - 10 companies - burned (some for heating shop)- 4 companies • 0 companies
10. Metal	<ul style="list-style-type: none"> • 19 companies • waste management practice - landfill site - 2 companies - reuse - 3 companies - recycled off site - 14 companies
11. Glass	<ul style="list-style-type: none"> • 2 companies • waste management practice - landfill site - 2 companies
12. Cardboard	<ul style="list-style-type: none"> • 20 companies • waste management practice - landfill site - 12 companies - recycling - 2 companies
13. Garbage	<ul style="list-style-type: none"> • 11 companies • waste management practice - landfill site - 10 companies - recycling - 2 companies

	14. Other waste (gloves, rags, rollers)	<ul style="list-style-type: none"> • 13 companies • waste management practice <ul style="list-style-type: none"> - landfill site - 9 companies - burn - 1 company
3. Environmental Improvements	<p>Are you working on environmental improvements?</p> <ul style="list-style-type: none"> • No • Yes 	<ul style="list-style-type: none"> • 5 companies (22%) • 15 companies (65%) <p>Examples provided:</p> <ul style="list-style-type: none"> - separate wood (6 companies) - green bins (3 companies) - recycle acetone (2 companies) - recycle barrels (2 companies) - clean-up (2 companies) - drum return to supplier - recycle (cardboard, steel, aluminum, paint, acetone) - burn wood for heat - building for hazardous materials - ventilation systems - separate waste / recyclables
4. Miscellaneous	<p>What waste streams are creating difficulties?</p> <ul style="list-style-type: none"> • no difficulties • mentioned difficulties with waste materials 	<ul style="list-style-type: none"> • 4 companies (17%) • 16 companies (69%) <p>Examples of problem waste materials:</p> <ul style="list-style-type: none"> - fiberglass / frp (5 companies) - glue containers / contact adhesive (4 companies) - cardboard (3 companies) - resin (3 companies) - resin drums (2 companies) - wood (2 companies) - foam (2 companies) - gel coat containers (2 companies) - un-used gel coat (1 company) - engine oil (1 company) - rollers (1 company) - acetone (1 company) - styrofoam (1 company)
	<p>Are you interested in attending information / training sessions related to environmental issues?</p> <ul style="list-style-type: none"> • no • yes 	<ul style="list-style-type: none"> • 5 companies (70%) • 16 companies (22%) <p>Topics of interest:</p> <ul style="list-style-type: none"> - Proper waste disposal (2 companies) - Environmental legislation (2 companies) - Reduce waste / save money (3 companies) - Reducin' Pollution Guidebook (1 company)

	<p>Do you have any suggestions of possible solutions?</p>	<ul style="list-style-type: none"> • 11 companies responded. Ideas include: <ul style="list-style-type: none"> - joint venture to create acetone recycling machine - re-use of hardened resin - go along with program - certain time of month, all boatshops put things together - one place for everything - dump - regular hauler once a week - government says one thing and haulers another - more restrictions causing more problems - costly to dispose / enforce too many rules - get rid of everything illegally - dust fibreglass is not a concern - time is a concern /difficult to break old habits
	<p>Do you feel you have a good understanding of environmental legislation that pertains to your business?</p> <ul style="list-style-type: none"> • Yes • Somewhat • No (including 'not sure') • Do not care 	<ul style="list-style-type: none"> • 9 companies (39%) • 7 companies (30%) • 4 companies (17%) • 1 company (4%)
<p>5. Observations by NSYCC</p>	<p>Recorded observations are too varied to draw any conclusions.</p>	

Survey of Waste Management Practices in the FRP Boatbuilding Industry
 Summary of Data Collecting during July and August 2004

Table 2 : Data collected from **2 waste haulers** in the southwestern region of Nova Scotia.

Topic	Question	Answers / Data
Waste Characterization	How much waste do you receive from boatbuilding shops?	Inconclusive
	What types of waste do you get from these facilities?	Hauler 1. Wood (plain, covered with fibreglass); pieces of fibreglass, cardboard with fibreglass Hauler 2. Domestic garbage (cardboard, recyclables); dried up paint cans, containers
	Can you give us an idea of the amount of each type of waste that is found in a typical load from a boat shop?	Hauler 1. 80% wood; 20% cardboard (half contaminated); plexiglass Hauler 2. 50% cardboard; 25% paper waste compost; 20% cans, containers
	Where do you take the waste?	Hauler 1. Landfill Hauler 2. Landfill except recyclables
	Have you ever had loads turned away?	Hauler 1. No
Recyclables	Do you get loads of recyclables from boat shops?	Hauler 1. No such thing.
Challenges / Ideas for Solutions	Do you have any suggestions for boat shops regarding their waste loads?	Hauler 1. On-site container that can contain 3-4 different waste streams. Hauler 2. Every business should have someone to educate the business on garbage pickup.
	What are the main challenges facing boat building industry related to waste disposal and recycling?	Hauler 1. Training and educating people on how to do things. People don't have time to do everything (ie. sort).
	Do you have any suggestions on how to improve or remedy challenges associated with waste and recyclable materials from the boatbuilding industry	Hauler 1. Consistency - government to municipal, commercial. Everybody do the same. Hauler 2. Somebody should look after garbage and educate boat shops on landfill practices/ recycling etc.

Table 3 : Data collected from **6 Municipalities** in the southwestern region of Nova Scotia.

Topic	Question	Answer / Data
Challenges	Is the Municipality facing any challenges in relation to waste and recyclable materials from the boatbuilding industry?	1. No (4 respondents) 2. Yes (2 respondents) Some materials do not fit C&D site and landfill site
Complaints	Are you receiving calls from the boatbuilding industry regarding their waste?	1. No (5 respondents) Waste Check may be getting calls.
	Do you receive calls from other organizations or the public regarding waste disposal practices of the boat building industry?	1. No (4 respondents) 2. Yes (2 respondents) Public calls once in a while about the smell / not tidy. Complaints about burning.
Solutions	Do you have any suggestions on how to improve or remedy challenges associated with waste and recyclable materials?	1. No (3 respondents) 2. Solutions included: - Work together regionally, jointly, coordinated approach. - Local solutions provided, local infrastructure. - Guidelines clearly defined. - Education, properly sort it. Recognize that sorting is needed.

Survey of Waste Management Practices in the FRP Boatbuilding Industry
 Summary of Data Collecting during July and August 2004

Table 4 : Data collected from **4 operators of landfill sites(2) and construction and demolition debris sites(2)** in the southwestern region of Nova Scotia.

Topic	Question	Answer / Data
Waste Characterization	How much waste do you receive from boatbuilding shops?	C&D - not much; don't keep track. Landfill - not sure, not a whole lot
	What types of waste are received from boatbuilding shops?	C&D - construction wastes, wood with fibreglass; resin Landfill - wood; fibreglass; metal
	Can you give us an idea of the amount of each type of waste is found in a typical load from a boat shop?	C&D - 85% wood (not contaminated) / 100% wood Landfill - <5% cardboard; 80% wood; 15% miscellaneous (paint cans, rollers)
	Have you ever turned loads away? How many?	C&D - 2 yes (contaminated wood; anything contaminated) / not many. Landfill - no (1 respondent); yes (1 respondent)
	Do you ever receive any hazardous waste from boatbuilding shops?	C&D - no Landfill - don't accept (1 respondent); oil (1 respondent)
Complaints / inquiries	Have you received any calls from boatbuilders regarding their waste?	C&D - yes (ask where to get rid of wastes) Landfill - no (2 respondents)
Challenges / Solutions	Do you have any suggestions for boatbuilding shops regarding their waste?	C&D - Take to Yarmouth Landfill Site. Roll on container - cheaper and easier on gas; not bad on hauling fees. Have container on site for motor oil. Landfill - Separate (2 respondents)
	Do you have any suggestions on how to improve or remedy challenges associated with waste and recyclable materials from the boatbuilding industry?	C&D - Before banning things, find solutions. Education. Landfill - Environment and Labour, lighten the restrictions

Survey of Waste Management Practices in the FRP Boatbuilding Industry
 Summary of Data Collecting during July and August 2004

Table 5 : Data collected from **3 suppliers**

Topic	Question	Answer / Data
Products sold to Boatbuilding Industry	What do you sell to the boatbuilding industry?	Supplier 1. Fibreglass raw materials; cleaners; hardeners Supplier 2. Resin, foam/cores Supplier 3. Fibreglass reinforcements; resins; gel coats; catalysts; acetone
Waste Take-Back Service	What do you take back from customers?	All suppliers: Product -sometimes; empty containers - yes
	What happens with these items?	Supplier 1. Sold to recycler. Supplier 2. Shipped somewhere else. Supplier 3. Recycle / crushing in Halifax
	What percentage of your customers return empty containers and other materials to you?	Supplier 1. 40% Supplier 2. 30% Supplier 3. 80%
	Do you know why some of your customers do not use the return service?	Supplier 1. Some buy from other companies. Supplier 2. Only offer to certain customers (cost to supplier). Supplier 3. Unknown.
	Are there certain things that the boatbuilder needs to do in order to use this service?	Supplier 1. Clean bins, keep bungs in them. Supplier 2. Has to be bigger company. Supplier 3. Drums must be empty with both bungs; laid on their sides so water will not get in; must be clean outside; help to load truck.
	Have you encountered any problems associated with your take-back service?	Supplier 1. No. Supplier 2. No. Supplier 3. Only 1 place in Hfx to take them. Price has risen and customers not willing to pay more.
Inquiries	Do boatbuilders call you and ask for advice on how to dispose of empty containers or excess product? What do you tell them?	Supplier 1. Yes, but rare. Call local Municipality / Town Supplier 2. Yes, sometimes big customers. Small companies don't call. Supplier 3. Yes. Give names of companies such as Safety Clean in Halifax to take back empty 5 gallon plastic containers and acetone.