GreenHorn Recycling

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* Logo permission pending

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1. Executive Summary

GreenHorn Recycling (GHR) is a 501(c)3 Non-profit organization that will recycle cardboard, paper, plastic, and aluminum materials generated on the University of South Florida Tampa Campus and in the surrounding communities.

The growth of the USF's student body and surrounding communities provide sustainable inflows of recyclable material. This material will be sorted, baled, and sold to third party material processors. All materials will be processed in a 18,000sq/ft facility located on or near the USF Tampa Campus.

GHR target market will be the USF Tampa Campus students, staff, and faculty and the communities surrounding the USF campus. Temple Terrace and MOSI will be the first organizations implemented into our program. The target market is expected to grow at 3.5% every year until 2012. The recyclable materials available to GHR total over 22,000 tons in 2006.

GHR believes that an opportunity exists in the recycling industry due to several reasons:

- National Movement toward sustainability.
- Large resource pool of Municipal Solid Waste.
- Currently insufficient USF recycling efforts.
- Pricing Strategy (Free for our target market).
- USF positive name recognition.

GHR corporate structure as a Non-Profit provides the advantage of showing the organization's goal is campus sustainability. GHR will differentiate itself from its competitors by offering its target market a free service and reaching this market by incorporating effective education and marketing strategies.



Recycling operations will start in 2008. By 2008, the company plans to have a 12.68% of total market share (Hillsborough County). GHR is expecting to be financially sustainable by the end of year 2010 when it will no longer need grants. The company's break-even volume is 3,800 processed tons and \$819,260 in revenue in 2012.

The GHR team has done a thorough research into the recycling industry, the service, and the market. Management plans to have a board of directors and a board of advisors composed of recycling industry leaders and USF professors to provide guidance and vision.

GHR is seeking \$1.3 million dollars over a 5 year period in order to implement the plans mentioned herein. Funding will be solicited from the Environmental Protection Agency (EPA), other federal state and local organizations and other philanthropic organizations that encompass the same mission of sustainability.

Please see appendix H for letters and thank you's.



2. The Industry and the Company and Its Service

A. The industry

1. Background

The recycling industry was born in the late 70's after the earth day movement began and is encompassed by a greater "Green" Movement. The "Green" Movement initially experienced great traction but was forgotten during prosperous economic trends of the late 90's. Currently the recycling industry is experiencing a rebirth as the concept of sustainability has coupled with a heightened awareness of American dependence on foreign energy sources.

For example the Florida Department of Environmental Protection (DEP) has developed a new program to enhance auto recycling in Florida. Auto salvage yards have a large amount of harmful chemicals stored on-site including oil, antifreeze, freon, and battery fluids and metals which all require special handling to avoid environmental contamination. In 1996-98, DEP inspected a sample of 37 salvage yards which showed that only 8% complied with all regulations on the handling of the hazardous wastes.

To fight this, the DEP is sponsoring nine free workshops across the state to guide Florida's automotive recycling industry from March 9th to April 6, 2006. They are promoting "Green Yards Certifications" for automotive recyclers who have demonstrated environmental performance that goes above and beyond regulatory requirements to include using best management practices that help protect the environment.¹ Twenty-one facilities have been green certified since its inception. This new program will start in June could set the standard nationwide for the environmental improvement of auto salvage yards.

Bill Rutherford operates in Orange County and is currently participating in the Green Yards program. Rutherford said employee training is something his company feels is extremely important. "We have a great deal of employee training on how to

¹ Compliance Assistance Program for Automotive Recyclers; FDEP April 07, 2006 www.dep.state.fl.us/waste/categories/hazardous/pages/AutomotiveRecyclers.htm



handle the waste and it all goes hand in hand with the daily monitoring of the facility," he said. "The mentoring part of the program is also very helpful to help educate and inform on different situations and materials."²

This exemplifies the importance for adequate education.

The GHR opportunity involves exploiting part of the Municipal Solid Waste at the USF Tampa Campus. Municipal Solid Waste (MSW) includes garbage or refuse that is generated by households, commercial establishments, industrial offices, schools or lunchrooms waste as shown in Figure 1.



Source: Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels (1996).

Figure 1 MSW generation and distribution

² DEP starts innovative salvage yard program in Central District; By Peter J. Hovanec, Enviro-net, www.enviro-net.com/main.asp?page=story&id=1&month=09&paper=fl&year=2002



2. Industry Analysis

Americans spend over \$30 billion a year to manage the disposal of a single year's eight billion tons of waste. Approximately 232 million tons³ are labeled as municipal solid waste (MSW Figure 2). The remaining are industrial wastes generated by

manufacturing, agriculture, and mining. Included in the definition of municipal solid waste are durable and nondurable goods, containers, food scraps, yard waste, and inorganic waste from residential, commercial, recreational, and institutional sources. GHR is concerned about Hillsborough County MSW; the typical recycling components (see Figure 3).⁴



Figure 3 MSW Hillsborough County



Figure 2 MSW Generation and Distribution

Florida hosts nearly 3,700 recycling and reuse establishments employing approximately 32,000 people generating an annual payroll of \$765 million and \$4.4 billion in annual revenues.⁵ Recovering materials from the waste stream must be profitable simply by the number of businesses in Florida operating. Further if we look at the cost of using raw materials vs. recovered materials, are significant

³ Recycling Works! State and Local Solutions to Solid Waste Management Problems, April 1999; Environmental Protection Agency www.epa.gov

⁴ Recycling -2002 Solid Waste Annual Report Data

www.dep.state.fl.us/waste/categories/recycling/pages/02_data.htm

⁵ Final Report U.S. Recycling Economic Information Study; Prepared for The National Recycling Coalition by R. W. Beck, Inc. July 2001



energy savings (Figure 4). These two statistics alone inspired the GHR team to pursue the opportunity of privatizing recycling on campus.



Figure 4 Energy Savings for recovery.⁶

3. Florida Component

Florida - 1988 law sets county recycling goals of 30% of all solid waste and 50% of each of five material groups (glass, newspaper, aluminum, steel, and plastic) by 1994. In 2002, the statute was amended to read a "significant portion of at least four of the following materials from the solid waste stream prior to final disposal at a solid waste disposal facility and to offer these materials for recycling: newspaper, aluminum cans, steel cans, glass, plastic bottles, cardboard, office paper and yard trash." Counties with populations less than 50,000 are excluded from these requirements provided that they offer the opportunity to recycle. In 2002, the Legislature changed the statute to exclude counties with populations less than 100,000. Most counties met the 30% goal, however, no county met the 50% goal in ALL given material groups. In 1998, the State changed the way construction and demolition was reported. Since that time, with the decrease in the amount of construction and demolition debris allowed to count toward the recycling goal and the increase of tons disposed, only about one-third of the counties met the 30% goal in 2003. There are penalties for large counties that do not meet the 30% goal. In 1997, a bill passed awarding a \$1.7 million for innovative grants. Counties compete for the grants by responding to FDEP criteria. As of spring 2004, \$9.8 million has been

⁶ Recycling Works! State and Local Solutions to Solid Waste Management Problems, April 1999; Environmental Protection Agency www.epa.gov



awarded for innovative grant projects. The program is mandatory and the penalty of noncompliance is the cutting off grant money and refusal of permits.⁷

4. USF Component

GHR was investigated handling the recyclable component of MSW which primarily comes from the USF campus in Tampa, Florida. Currently USF has an internal recycling program that primarily collects mixed paper from the main office buildings. The over 500 - 64 gallon green containers are wheeled to the curb 4 days a week by custodial staff. A USF truck collects paper until it is full and then transports it to an offsite recycling company for processing.

Aluminum is collected in about 100 - 25 gallon containers on Campus. These are consolidated into a larger 4 yard Igloo container. Once again when the container becomes full, the driver empties it into a truck and it is transported to an offsite recycling center for processing. Glass and plastics are collected at the USF Community Recycling Site located on Sycamore Dr. This site is used by individuals who live in apartments around campus, where no recycling pickup is available. Tampa removes collected recycling materials at this site as detailed in Table 1.

	Size		
#	(yds)	Material	Collected
4	12	Glass & plastic	twice a week
4	12	Cardboard	twice a week
2	12	Newspaper	as needed
1	30	Newspaper &	once a week
		Magazines	By Tampa
2	4	Aluminum	By USF

Table 1	USF	recycling	components
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All the income derived from USF recycling is listed in Table 2.⁸ Additionally Scrap-All, an outside contractor, provides a 30 yard container to collect mixed metals at

www.afandpa.org/Content/NavigationMenu/Environment_and_Recycling/Recycling/State_Recycling_Goals/State_Recycling_Goals.htm

⁷ State Recycling Goals & Mandates, 2002 American Forest & Paper Association



the Physical Plant. Last year it collected 91 tons of mixed metal and generated \$2,336 from the sale. Each university department is responsible for the proper disposal of their electronic equipment through a company of their choice, which typically is an expense.

	USF Ca	ampus		Sycam	ore Site	
Year	Tons	income	\$\$/ton	tons	income	\$\$/ton
2002	169	\$2,802	\$16.58	232	\$3,572	\$15.40
2003	246	\$3,381	\$13.74	430	\$4,392	\$10.21
2004	345	\$9,246	\$26.80	406	\$11,028	\$27.16
2005	245	\$6,881	\$28.09	416	\$12,864	\$30.92

Table 2 USF recycling income

Aluminum							
Year	tons	income	\$\$/ton				
2002	3.5	\$2,600	\$743				
2003	3.3	\$2,453	\$743				
2004	2.5	\$2,117	\$847				
2005	2.1	\$2,212	\$1,053				

5. Campus Recycling Sustainability

If we take a look at the numbers in Table 2 (above) we see that for the last 4 years the total income is only \$63,548. The USF recycling coordinator and truck driver salaries account for more than this amount in a single year. Considering the cost for the trucks and recycling collection containers and advertisements quickly destroyed all hopes for GHR to privatize recycling into a for-profit venture. Taking into consideration other campuses in Florida, FSU determined their Net Benefits of Increased Mixed Paper Collection, Figure 5.⁹

⁸ Monroe, Dot, Program Assistant, Recycling University of South Florida 2006 letter; 813-974-0092 dmonroe@admin.usf.edu

⁹ Net Benefits of Increased Beverage Container Collection, Recycling at Florida State University, URP 5222: Policy Analysis, Fall 2004 www.coba.usf.edu/hannawest/RecyclingatFSU.pdf



"Head Recyclers" with I	New Bins					
		Year 0	Year 1	Year 2	Year 3	PV 8%
Costs	Upfront Capital	\$3,250	\$0	\$0	\$0	\$3,009
	Labor, O&M		\$26,000	\$26,000	\$26,000	\$174,462
Benefits	Revenues		\$1,710	\$1,710	\$1,710	\$11,474
	Avoided Costs		\$10,260	\$10,260	\$10,260	\$68,845
Net Annual Benefits			-\$14,030	-\$14,030	-\$14,030	-\$97,392
New Maintenance Staff						
		Year 0	Year 1	Year 2	Year 3	PV 8%
Costs	Upfront Capital	\$0	\$0	\$0	\$0	\$0
	Labor, O&M		\$54,000	\$54,000	\$54,000	\$362,344
Benefits	Revenues		\$1,710	\$1,710	\$1,710	\$11,474
	Avoided Costs		\$10,260	\$10,260	\$10,260	\$68,845
Net Annual Benefits			-\$42,030	-\$42,030	-\$42.030	-\$282,025

Figure 5 Mixed Paper Net Benefits

Their Net Benefits of Increased Beverage Container Collection had better results (see Figure 6). But both resulted in significant losses. Their conclusion was simple:

"Absent a market to sell recycled goods, most attempts to generate revenue from the sale of recyclable materials removed from the waste stream will result in large dollar losses. While recycling is seen as a noble enterprise, undertaken to promote the social good, it seldom pays off monetarily."¹⁰

"Head Recyclers" Program							
"Head Kecyclers" Pr	ogram	Year 0	Year 1	Year 2	Year 3	PV 8%	
Costs	Upfront Capital	\$0	\$0	\$0	\$0	\$0	
	Labor, O&M		\$26,000	\$26,000	\$26,000	\$174,462	
Benefits	Revenues		\$315	\$315	\$315	\$2,114	
	Avoided Costs		\$945	\$945	\$945	\$6,341	
Net Annual Benefits			-\$24,740	-\$24,740	-\$24,740	-\$166,007	
"Head Recyclers" Pr	ogram with New Bins						
		Year 0	Year 1	Year 2	Year 3	PV 8%	
Costs	Upfront Capital	\$3,250	\$0	\$0	\$0	\$3,250	
	Labor, O&M		\$26,000	\$26,000	\$26,000	\$174,462	
Benefits	Revenues		\$315	\$315	\$315	\$2,114	
	Avoided Costs		\$945	\$945	\$945	\$6,341	
Net Annual Benefits			-\$24,740	-\$24,740	-\$24,740	-\$169,257	
Retrofit Outdoor Bin	5						
		Year 0	Year 1	Year 2	Year 3	PV 8%	
Costs	Upfront Capital	\$37,440	\$0	\$0	\$0	\$37,440	
	Labor, O&M		\$0	\$0	\$0	\$0	
Benefits	Revenues		\$315	\$315	\$315	\$2,114	
	Avoided Costs		\$945	\$945	\$945	\$6,341	
Net Annual Benefits			\$1,260	\$1.260	\$1.260	-\$28,985	

Figure 6 Beverage Container Net Benefits

¹⁰ Ibid page 67



B. The company and the concept

1. Company Scope

GHR will establish a sustainable recycling program through a Non-Profit educational company. Industry leaders in the "Green" or sustainability movements employ a triple bottom line concept (Figure 7) when evaluating their business operations. The triple bottom line concept considers all business decisions from three perspectives: Environment, Economic, and Social.

- 1. Environment (Is the decision profitable to our Environment?)
- 2. Economic (Is the decision profitable to our Business?)
- 3. Social (Is the decision profitable to our People?)



Figure 7 Triple Bottom Line

As a Non-Profit Company in the "Green" and Sustainability industry we consider this triple bottom line concept a key to our success. We will endeavor to make all decisions considering all three of these bottom lines.

The Ecology Bottom Line ensures we consider Mother Nature. Mother Nature is the ultimate stakeholder in our analysis. The Ecology Bottom Line may often times be difficult or impossible to quantify. Business decisions of GHR will use a common sense approach to consider the ecological impact of its decisions. The Economy Bottom Line ensures we consider our organization. GHR will seek to generate positive revenue streams to reinvest in improving our operational processes. The Economic Bottom Line is the focus of this Business Plan. The Equity Bottom Line ensures we consider our



people. All of our stakeholders will be considered in our business decisions. GHR will adhere to an appropriate organizational ethics program to ensure all employees understand this essential ethic.

Considering all three of these perspectives simultaneously when making business decisions will assist in steering GHR and its employees into the direction of good decisions for all stakeholders. GHR will initiate its plan for USF on a limited scale in order to test the success. GHR's pilot program will be implemented in the College of Business Administration and at the executive levels as indicated by the red boxes on the graphic Figure 8.¹¹



Figure 8 University of South Florida Organizational Chart

At the pilot locations GHR will begin by managing of the locations paper recyclables in order to gauge the effectiveness and viability of the venture. After the pilot stage, GHR will expand the recycling initiative to the other Colleges of USF dependent

¹¹ Organizational Chart of Administration; USF, 2006 www.usf.edu/admin_org.html



on faculty and student volunteer interest and support. The College of Engineering will most likely be the first college which GHR would like to expand into since student groups are already working on sustainable issues. The USF Chapter of Engineers for a Sustainable World Chapter at the University of South Florida will help make this effort successful. Civil and Environmental Engineering are involved with these issues: http://cee.eng.usf.edu/Research/research_WRE_RT.htm

At the pilot location GHR used total paper costs and the shredded paper costs to determine recycling savings, see Table 3 & 4.

FY 04/05 Paper

	•	
8/23	Color Paper	9.80
10/13	Paper	4,347.28
2/3	Paper	4,251.52
3/24	Paper for Copy Room	132.90
5/24	Paper for Copy Room	5,059.87

 Table 3 College of Business paper purchases for 2006

\$ 13,801.37

Table 4 College of Business Shredding costs for 2006

FY 04/05	
Shredding	
9/8/2004	\$468.60
9/21/2004	\$90.00
11/9/2004	\$127.17
1/10/2005	\$90.00
2/21/2005	\$90.00
3/4/2005	\$118.50
3/18/2005	\$240.40
4/27/2005	\$126.00
6/3/2005	\$90.00
	\$1,440.67

The success of the pilot program will be used to develop additional funding sources. The existing operation as a non-profit will be exemplified as this service expands. The next steps for company development discussed in more details in later sections include:

1. The pilot as a volunteer service.



- 2. After the successful pilot the group will incorporate and substantiate public funding to obtain a provisional 501(c)3 Non-Profit Corporation.
- Operation expansion through outside funding sources including a \$1.3 million grant for operations and design facility operations from EPA (or similar source)
- 4. Develop and expand education and research activities linked with the USF Sustainability Office.
- Provide research and development funding ==> creating a professional think-tank for utilizing recycled materials, methods and new technologies.

GHR will expand the concept of sustainability on the USF –Tampa Campus. GHR combines University and area businesses resources to improve sustainability on USF's campus and the surrounding community.

C. The service

GHR will recycle solid materials at USF and the surrounding community. This will include several stages:

- Community marketing The USF area will be saturated with recycle speak and clearly marked and attended containers where everyone can easily separate recyclable materials.
- 2. Coordination Colleges and community building will have their recycle containers emptied regularly and materials taken to MRF.
- Densification MRF facilities will separate, consolidate and compact each material for sale to bulk shippers.
- Research MRF income will be used for further technology innovation and testing to develop new procedures and patentable products with utilized waste materials.
- 5. Education MRF facility will provide training to other MRF operational staff.



USF's current recycling program will be heavily involved in building the company. GHR will collect, sort, and bale: paper, cardboard, plastic and aluminum. The bales will be sold at market value to local recycling companies who will transport the material off campus.



GHR will partner with USF's administration, Physical Plant, and businesses in the community to create an 18,000sq ft. Materials Recovery Facility (MRFs). GHR will operate within the MRF and will provide the coordination, education and collection of recyclable items on the USF campus. GHR plans to have a contract with USF to take all "scrap" generated by the

campus. GHR will sell or dispose of the material once it is processed at the MRF.

GHR will work with the campus administration, facilities, and student organizations to provide a comprehensive collection process. Every building will be included in the program. The program will include:

- An established recycling office that manages recycling staff and administrative functions
- Containers for separating and storing materials
- A vehicle for transport
- A warehouse to process and stage materials
- Partnership with the University of South Florida
- Partnership with area material processors



MRF is a facility where glass, metals, paper products, batteries, household hazardous waste, fertilizers or other recyclable items are processed for recycling or reuse after being separated from the mixed solid waste stream. This adds value to the material which can be sold at a

higher price. The MRF will provide a central location for the USF population and surrounding community to bring recyclable material to be processed.



MRF will have a 2nd story classroom with a glass observation deck to facilitate recycling education. Included will be incubator labs for research within the MRF. USF Colleges can rent these incubators from the MRF to research anything from increasing recycling, reduction of solid waste, or Bio-Fuels.

D. Entry and growth strategy

Long Term

GHR will continue to strive for campus sustainability and hopes to accomplish this through a long term growth strategy:

- 1) Build a broker web site to bring buyers and sellers together.
- Collect, recycling, or dispose of Construction & Demolition debris, food waste, hazardous waste, and Bio-Waste.
- Research and develop ways to use the recycled material on campus instead of selling it off campus.
- 4) Implement a manufacturing and distribution facility for alternative fuels.
- 5) Build energy to waste combustion plant to provide energy to the campus.
- 6) Provide energy audits for departments or individual buildings on how to be more "green."
- Encourage fund raising ideas to campus organizations to increase recycling through education.
- 8) Look into Solar Energy to create energy for the USF campus.
- Have local cities / municipalities bring their materials to be processed at USF's MRF.
- 10) Build an educational branch to market; provide sustainability education, and public relations.
- 11) Provide recycle drop-off canisters to local businesses.
- 12) Have local recycle businesses bring their colleted material to be processed at USF's MRF.
- 13) Look off campus to apply lessons learned.



3. Market Research and Analysis

A. Customers

The current and potential customers include the 35,000 existing USF students and 12,000 USF staff and faculty. Since the USF recycling program is a relatively new program and does not have the support that other colleges have, all 47,000 customers will be served at USF. Therefore, active and full participation from all students, faculty, and staff is necessary in order to make the program successful. GHR will operate on the USF Tampa campus. USF has a very diverse campus with students coming from all over the country, as well as from all over the world. Recycling is an ongoing process. It will be accomplished through out the entire academic year (Spring, Fall, and Summer). However, recycling will tend to decrease during the summer term, where student attendance decreases.

Currently, recycling participation at USF is very minimal. Therefore, GHR will market these three groups by demographic and geographic segmentation. The demographic segment includes male and female USF students, faculty, and staff of all ages. The geographic segment includes anyone with USF affiliation in the Tampa USF campus. GHR considers these groups easily reachable and extremely receptive once educated. At present, the primary target market does not actively participate in recycling either because of convenience (individuals prefer the conventional way of disposing their waste which is in the closest garbage bin), or because they have not been educated on the importance of recycling and sustainability or, because they do not have the appropriate tools to recycle.

Among some of the benefits GHR offers USF include increasing sustainable practices by conserving natural resources, building smart economies and, providing USF with great public relations. This program will enhance the reputation of USF, while reducing costs and contributing to a better environment. GHR will reach these objectives by decreasing the costs of waste disposal and increasing revenues from the sale of



recyclables. These proceeds will be used to improve the current recycling program at USF and to finance marketing and educational programs to increase awareness in USF.

GHR has also considered reaching private institutions around the USF Tampa area and neighboring cities as a secondary target market. Bush Gardens, MOSI and the City of Temple Terrace fall under this section. These markets have been taken into consideration because of the additional waste tonnage they can bring to the GHR's processing center. These groups will benefit from the proximity and easy access to a MRF. However, GHR will not direct any educational or marketing programs to these exterior sources. This strategic move will allow GHR to increase its revenues with the sale of the recyclables.

B. Market size and trends

GHR's estimated market share is presented in Table 5. Due to the company's early stage of development we have considered Hillsborough County as the current total market. GHR market share will be less than 6% of the entire market. This market share is projected to increase to 8% by 2008. The company derived this estimate by assuming an average growth of 3.5% per year for the USF population. This percentage has been calculated taking the average growth of the USF population for the last five years. The population growth of the City of Temple Terrace and private institutions around the USF Tampa campus has also being calculated at 3.5%. This is considering a conservative scenario for the growth of this population segment. All three years tonnage figures are based on a 6.5% for Hillsborough County and a 3.5% tons per person per day for USF and surrounding communities and institutions.

Table 5	GHR:	Market	Ana	lysis
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	2006			2007			2008		
		Tons/	Market		Tons/	Market		Tons/	Market
	Population	Year	Share	Population	Year	Share	Population	Year	Share
Hillsborough County	1,150,000	1,364,188	100%	1,186,800	1,497,842	100%	1,228,338	1,457,116	100%
USF Tampa, Temple									
Terrace, private groups	770,300	172,545	12.65%	797,261	178,584	11.92%	825,165	184,834	12.68%



Trends

In the United States from 1967 to 2000, the recycling industry experienced annual growth rates of 8.3% in the number of jobs and 12.7% in gross annual sales (see Figure 9). In the year 2000, US recycling industries included more than 56,000 public and private sector facilities that sustained 1.1 million jobs and had \$236 billion in gross annual sales. On the contrary, in 1967 the US recycling industries consisted of approximately 8,000 companies that employed 79,000 people and had \$4.6 billion in sales (Beck, 2001)¹².

Thousands of Tons.							
Data Type	Recycling Collection	Recycling Processing	Recycling Manufacturing	Reuse and Remanufacturing	Industry Total		
Establishments	9,247	12,051	8,047	26,716	56,061		
Employment	32,010	160,865	759,746	169,183	1,121,804		
Annual Payroll	956,875	3,826,360	29,181,749	2,747,498	36,712,482		
Estimated Receipts	1,974,516	41,753,902	178,390,423	14,182,531	236,301,371		

Figure 9 Estimates of Direct Economic Activity Annual Payroll and Estimated Receipts are in \$1,000. Throughput¹³ is in Thousands of Tons.

Nationally, as of the year 2000, 231.9 million tons of municipal solid waste were generated. Of the municipal solid waste generated, 23% was recycled and 7.1% was composted, for a net of 69.9% Material Solid Waste. It is estimated that 35%-45% of all MSW was commercially generated (EPA, 2000).¹⁴

A recent trend in the United States is the development of hundreds of processing facilities, called Material Recovery Facilities (MRF). These facilities help groups or even cities to implement cost-effective methods of processing waste by allowing them to sell these resources directly to end-user markets. Another trend is the expansion of existing capacity and the addition of new private recyclers to provide Intermediate Processing

¹² U.S. Recycling Economic Information Study, U.S. Environmental Protection Agency. R. W. Beck, Inc. July 2001

¹³ Throughput is amount of recovered material recycled and includes manufacturing scrap sent for recycling. It excludes materials prepared for fuel use and in-house process scrap returned to the manufacturing process. Throughput estimates are summed to avoid triple counting at collection, processing, and manufacturing stages.
¹⁴ Municipal Solid Waste in the United States: 2000 Facts and Figures, U.S. Environmental Protection

¹⁴ Municipal Solid Waste in the United States: 2000 Facts and Figures, U.S. Environmental Protection Agency.



Centers. This is due to the growing number of municipal programs and businesses that don't have the ability to handle material processing and the need to constantly meet material quality specifications (Ruston, 1996).¹⁵

In Florida the statewide recycling rate is 28%, very close to the 30% goal required of all counties with populations over 75,000 by Chapter 403, Florida Statutes. Scheduled recycling service was available to 51% of commercial establishments. Substantial additional recycling potential exists in the commercial as well as the construction and demolition debris sectors. Florida has 56 MRF, 158 Recovered Materials Processing Facilities, and eight permitted composting facilities (Hinkley, 2001).¹⁶

In American higher education, virtually every campus has initiated recycling efforts. It is estimated that the average diversion rate for institutions is 26%, with aluminum, paper, and cardboard volumes being the greatest (Takeuchi, 2003).¹⁷ State Agencies and Universities recycled nearly 1,903 tons of paper in 1998 generating over \$43,000 in revenues from its sale (Davies et al., 1999)¹⁸.

Another important trend is the growing quantity of recycling materials. This allows different sectors to process more tonnage and therefore apply more cost-effective methods. This eventually will allow some companies to transport these materials to more distant markets within the United States and to different parts in the World.

Technological advances are another important factor for the recycling industry. Nowadays more resources can be recycled into new products. Some of the post consumer recyclables include paper, glass, plastics, scrap metals, and waste tires (Ruston,

¹⁸ Recycling Awareness at the University of Waterloo.. Sarah Davies, Cynthia Baycetich, Hayley Berlin, Paige Agnew. July 1999

www.adm.uwaterloo.ca/infowast/watgreen/projects/library/ s99recyclingawareness.pdf

¹⁵Anti-Recycling Myths Commentary on Recycling is Garbage: Richard A. Denison, PhD, John F. Ruston; July 18, 1996

¹⁶ Florida's Recycling and Litter Programs: Bureau of Solid and Hazardous Waste

Bill Hinkley, 2001 www.dep.state.fl.us/waste/quick_topics/publications/shw/recycling/hb9.pdf

¹⁷ Business Plan Review of Recycling Activities, University of Colorado at Boulder. Takeuchi, April 7, 2003 www.colorado.edu/reports/recycling/downloads/RECYCLINGREPORT.pdf



1996).¹⁹ However, a big issue that the recycling industry is faced with is the volatility of recyclables prices. This is basically due to economic changes not only in the United States but in other countries as well, consumer choices on different products, the scarcity of raw materials, and consequently, the growing dependence on recycled products.

C. Competition and competitive edges

Direct Competitors

Nonparticipation of recycling efforts is the largest and most direct competitor of GHR. The traditional method of disposing waste creates a challenge for recycling programs. People find it more convenient to throw away their garbage in the closest trash can because of the fast pace lifestyle in the US. Therefore, changing people's attitudes is one of the biggest challenges for GHR.

Indirect Competitors

There are few solid waste processing facilities in the Hillsborough County. However, these are not considered direct competitors due to the fact that these companies do not offer the same service and advantages that GHR offers. In fact, we are secondary supplier to those companies. On the one hand, GHR will be the first non-profit company to consolidate and provide guidance and structure at the Executive/University level. GHR will offer its services free of charge, whereas any other company would charge a fee just to implement a similar program. GHR has the resources and ability to produce a great impact among people in USF; therefore, increasing recycling awareness and participation. The companies listed below are amongst some of GHR's indirect competitors:

- Hillsborough County Solid Waste management
- Angelo's recycling MRF
- EQ Florida, Inc.
- McKay Bay Waste to energy, City of Tampa
- Metro Recycling

¹⁹ Anti-Recycling Myths Commentary on Recycling is Garbage, Richard A. Denison, PhD, John F. Ruston July 18, 1996



- Plant City WPF
- Tampa material transfer & recycling MRF
- WMIF Tampa MRF

D. Estimated market share and sales

Commercial and institutional recycling is a waste stream area with major recycling potential. According to the Bureau of Solid and Hazardous Waste, to date, there has been minimal activity by commercial and institutional establishments across the State of Florida. Some mandatory commercial recycling ordinances have been implemented in some counties; however, they have not been enforced (Hinkley, 2001).²⁰ In addition, the cost of disposal for the commercial sector is relatively low resulting in little economic incentive to recycle. This is because the commercial and institutional sectors have not received sufficient information regarding the economics of and opportunities to recycle (Hinkley, 2001).²¹ GHR will take advantage of all these opportunities to implement a successful recycling program at the university level and get the state support at the same time.

Another key point to consider in the success of GHR is the role of the State of Florida towards recycling. Today, the state is focused on the following areas (Hinkley, 2001):²²

- Permitting, compliance and enforcement
- Establishment and tracking of county recycling goals
- Technical assistance
- Training
- Research and development
- Small targeted grants to stimulate innovation and efforts in specific areas

²⁰ Florida's Recycling and Litter Programs: Bureau of Solid and Hazardous Waste

Bill Hinkley, 2001 www.dep.state.fl.us/waste/quick_topics/publications/shw/recycling/hb9.pdf ²¹ Ibid.

 ²² Florida's Recycling and Litter Programs: Bureau of Solid and Hazardous Waste
 Bill Hinkley, 2001 www.dep.state.fl.us/waste/quick_topics/publications/shw/recycling/hb9.pdf



• Procurement and state agency recycling

With the state's support, GHR expects to launch a successful recycling program in USF.

E. Ongoing market evaluation

GHR will be flexible to adapt as conditions change. Recycling is a dynamic field undergoing changes in technology, market conditions, consumer waste generation patterns, and regulations. For that reason GHR plans to offer internships for USF students in each of these different fields. This includes marketing research, engineering research and sustainable development, etc.

Recycling awareness and participation in our target market will be evaluated based on performance measures. Once the program is in place, it will be monitored in order to determine if it is achieving the established goals. Data collection will also be used in order to determine if the program is working properly. Surveys and waste audits will be conducted in order to find out if proper recycling guidelines are being followed, if waste contamination rates are decreasing, and to discover new ways to reach our customers.



4. The Economics of the Business

A. Gross and Operating Margins

Our company will provide a unique service. We will take mixed paper, plastics and aluminum, free of charge from our customers, process it into sorted commodities, and sell it to the current market for recyclable goods. In addition, we will collect \$1.00 per student per semester for a recycling fee. These fees are not included in our gross and operational margin analysis.



We will be profitable in the 6th year of operations. We will rely on grants for 2006-2010.

B. Profit Potential and Durability

Our profits will be quite durable because we will be the sole service provider for USF in regards to recycling processing. We will obtain a contract with the university to secure this relationship. Our profits will continue to improve as we begin to refine more recyclables out of the waste stream through our marketing efforts. We also hope to increase our waste stream by incorporating other markets, like MOSI, Busch Gardens, and the City of Temple Terrace.





C. Fixed and Variable Costs

Below are the fixed and variable costs expressed as percentages of total costs and in dollar amounts. These are based upon industry benchmarks. Please refer to Appendix A of the business plan for detailed analysis of the costs.

YEAR	2006	2007	2008	2009	2010	2011	2012
FIXED COSTS(DOLLARS)	\$0.00	\$123,216.00	\$389,916.00	\$389,916.00	\$389,916.00	\$389,916.00	\$389,916.00
FIXED COSTS(PERCENTAGE)	0.00%	44.61%	46.42%	44.72%	44.15%	42.59%	41.13%
VARIABLE COSTS(DOLLARS)	\$55,836.64	\$151,980.00	\$448,634.00	\$480,516.90	\$491,812.95	\$524,128.60	\$556,670.32
VARIABLE COSTS(PERCENTAGE)	99.41%	55.03%	53.41%	55.11%	55.68%	57.25%	58.72%

D. Months to Break Even

We expect to break even in 56 months. Our first 2 years is our planning and relationship building phase. We incur minimal costs, and do not earn any revenues, except for grants. We begin operations in 2008 and will break even in 2011. By then, we will no longer rely upon grants for sustainability. We are requesting \$1.3M in grants for the first 5 years to sustain our operations before we can achieve sustainability. In the event that we cannot achieve our revenue required to break even, we will rely on more grants. In addition, we are being conservative and did not include donations in our financial statements. Donations could provide added revenue that may be used to cover non-budgeted costs, critical risks, and other unforeseen events. This would delay our time required to break even. Immediately after we break even, we will achieve positive cash flow. Below, we have depicted our revenues broken down to individual revenue



components and compared it to our expenses. Please refer to Appendix A, Statement of Cash Flows for detailed listing of revenues and expenses.





5. Marketing Plan

A. Overall marketing strategy.

The company's overall marketing strategy will be to appeal to our target markets' need to start recycling and get involved in the recycling process. GHR will portray an image of good service providing benefits to the community and the world for present and future generations. The company will establish this position by implementing several marketing strategies:

- A pilot program in the USF College of Business Administration. This includes students, faculty and staff. Penetration in this market will be the main focus for the company's early efforts. This segment will provide GHR the tools necessary to measure the performance of recycling at USF and set the example for other departments. This will be the foundation for the early stages of the service adoption phase in the recycling arena. GHR will concentrate on paper at first to get the university community used to the idea of recycling. This program will be used to obtain information and experience that will allow resolving problems and restructuring the collection and transportation process for the University accordingly. Based on the results of the pilot program, proper strategies will be implemented in order to meet the needs of USF and will ease the execution of a larger scale program of USF's Tampa Campus.
- An ongoing education program in the University level. This segment will create awareness among students, faculty and staff and increase participation in recycling at USF. As mentioned before, the long-term success of a recycling program depends on public participation. Therefore, students, faculty and staff will be constantly reminded of the environmental, economic, and social reasons for reducing and properly handling waste.
- Ongoing publicity and promotion programs.



- Implement cooperative marketing. With the help of local businesses, city and county waste reduction programs, GHR will be able to fund publications, advertisements and workshops.
- Informative sessions during USF Orientations.
- Strategic location of bins to promote awareness.

GHR will differentiate itself by promoting sustainability and generating revenue at the same time. The emphasis on the simplicity of recycling and the great feelings experienced after recycling will be the foundation for the success of GHR.

B. Pricing.

Recycling at USF will be voluntary. This will allow positioning the service in terms of continuous benefits to the local community such as the direct effect on the environment and, the image-enhancing result for USF. This will enable GHR to get the service accepted and increase our market share in the face of competition. Other recycling companies would not only charge a fee for implementing a recycling program of this scale on campus but would also charge disposal fees, transportation fees, etc.

C. Education Strategies

Education is one of the most vital components to help promote market development at the University of South Florida. Students, faculty and staff are the main components to the development of the program; therefore, educational programs for this segment are of greatest importance. The educational programs will target a number of audiences, including the residence halls, campus faculty and staff, and students groups (including fraternities and sororities). These groups will be educated to understand the importance of participating and following requirements regarding ways to recycle, acceptable materials and contaminants. To implement an effective education program, an education committee will be appointed to work with recycling staff. Waste management employees will also be educated to ensure recycling practices and the importance of quality control are understood.



Educational program tools will include announcements of the new recycling program, guides to recycling, surveys about recycling, printing guidelines, and stickers. GHR will also disseminate the information through newspaper articles, monthly newsletters and ads around campus. General procedural information will be transmitted directly to faculty, staff, and students through guides, emails, presentations and indirectly with stickers and information sheets on recycling containers. This will provide the campus participants an opportunity to help by preparing recyclables properly.

In addition, due to the temporary nature of students, a program will be created to receive information about various aspects of USF recycling program. GHR will take this opportunity to communicate recycling practices to future students. This program will become part of the University policy in order to ensure that it will take place on a regular basis.

To ensure the proper execution of these programs, a recycling coordinator will be hired. This person will be in charge of operations, networking, directing the educational campaigns mentioned above and other administrative duties. A staff member will also be identified to facilitate the implementation of these programs. As the plan evolves, more coordinators and staff will be hired accordingly.

An education and marketing budget is provided in the advertisement and promotion section below.

E. Advertising and promotion

Communication will be our most effective means of marketing our service. We will communicate our message through recycling guides, pamphlets, the University web page, and the University Radio & TV channels. We will also use print advertisement such as University newsletters and the student newspaper where we will announce steps being taken and publish interviews with the university president and other local business leaders. GHR will also encourage students to publish stories about recycling. This campaign will have two primary focuses:



- Create awareness of the company and its services
- Promote and expand recycling participation on campus.

Besides paper, other media will be used. This includes a list-serve, pencils, stickers, refrigerator magnets and, in the long run, reusable beverage containers. All the previously mentioned will increase the chances of students carrying that information with them more frequently and for a longer period of time. For example, reusable beverage containers will help communicating recycling awareness because students will be able to carry these mugs for several years. We also considered refrigerator magnets an effective promotion tool because we think students will be more likely to read what is written on a magnet than what is written on a piece of paper.

Building signs and displays, face-to-face contact for presentations, training, facility tours, and surveys will be used as well. Environmental bulletin boards will be placed in the Marshall Center and the residences halls. We considered these areas essential because they are central areas for students, and can allow us to reach a large proportion of the student population. Information displayed on these boards will include posters, contacts, places to obtain further information, and brief summaries of what is recyclable. Brochures and posters will be placed on top or next to every recycling bin providing information on proper recycling practice, what can be recycled and what cannot not recycled.

Once the entire program is implemented, the frequency in recycling on campus can be improved by implementing inter-residence contests, where floors who have the most recycling with the least contamination would win a prize. Possible prizes may include pizza and movie nights, weekend barbeques, etc. Cooperative marketing will also be implemented. This will allow GHR to fund publications, advertisements and workshops with the help of local businesses, city and county waste reduction programs.

The above mentioned strategies are being proposed to increase recycling awareness and participation in the University of South Florida. The following is a list of



the action plans and their cost. By implementing these action plans, the long term benefits will significantly outweigh the costs.

Table 6 Education and Marketing Budget (per semester, excluding summer)

Projected cost
\$ 0
\$0
\$0
\$0
\$0
\$0
\$0
\$0
\$4,000
\$6,000
\$27,608
\$6,500
\$3,000
\$14,500

Total Budget: \$61,608

F. Distribution

Besides being an originator of a large number of materials, USF is an enclosed community that has internal communication networks. Therefore, GHR will take advantage of this campus community networks to promote recycling and to implement it in the most effective way. The main channels of distribution will include the Administration, USF's governing student body, student groups (including the Greek



system), and volunteers. Volunteer coordinators will be designated in every student group and residence hall on campus, allowing direct contact with students. Utilizing students will benefit not only GHR but the students themselves by providing them with an opportunity to gain an academic hands-on experience to compliment their college experience.

Additionally, a recycling coordinator will track materials, coordinate the multiple routes and pickup days, identifying markets for the collected materials and other waste reduction opportunities. Since waste contamination is considered one of the biggest weaknesses for GHR, recycling staff will be responsible for tracking problem areas, and consistently monitoring all recycling locations.



6. Design and Development Plans

A. Development status and tasks

GHR will use the existing industry standards to processes, collect, and add value to recyclable items to be recycled. All materials will be sorted and bailed for transport to companies that bring the materials to market. To insure company sustainability, GHR will secure contracts to receive all recyclable materials from the USF- Tampa Campus, Temple Terrace, MOSI, Bush Gardens, Yuengling Brewery and Hillsborough County.

B. Difficulties and risks

One of the biggest risk GHR faces is not getting enough tonnage from the USF campus, local businesses, and the local community. Transient population, multiple departments to coordinate, apathy or disinterest, negative national media about recycling, space & storage constraints, esthetics, fluctuating markets, lack of infrastructure, funding, building and equipment selection are all difficult issues with which we will contend.

C. Product improvement and new products

Future

Three primary approaches to developing new markets for recyclables are generally associated with business development:

- attracting an established recycling industry to locate a manufacturing facility,
- encouraging existing local manufacturers to use or increase their use of recyclables;
- assisting local entrepreneurs with the start-up of small-scale manufacturing businesses.

The most traditional approach to recycling market and economic development has been to encourage large companies to locate a plant in a given region by providing incentives. This method has been used successful to develop recycling markets in many areas of the United States. For instance, for years, paper and steel mills have solicited


competitive requests from potential suppliers of recyclables when deciding to locate new facilities; large suppliers along the east and west coasts, such as the cities of Boston, New York, or San Diego, are often competitors for such facilities. However, as the number of communities in need of markets continues to grow, the number of large recycling industries capable of locating and building new facilities does not. This is evidenced by the fact that more recently announced industry expansions are adding capacity to existing facilities rather than locating new facilities.

D. Costs

Costs for operation of the GHR will be kept to a minimum due to our business structure and the market we are in. Our goal is to lease both the building and all equipment to reduce our costs. A complete list if cost is located in Appendix A.

E. Proprietary issues

Contracts: Depending on the type of program, a variety of contracts may be needed. All aspects of recyclable operation, including collection, processing, and marketing, may be covered by contract. Construction of a MRF may also be covered by local bidding laws, and it may be necessary to negotiate a variety of contracts. Specifications for equipment purchases must also be developed.

- Only pay for trash USF campus generates
- Avoid "flat fee" contracts
- Weight slips, verification
- Know where loads are going
- Insurance issues
- Flexibility in service
- Schedules/sizes
- Competitive bidding
- Lease versus own containers



7. Manufacturing and Operations Plan

A. Operating cycle

Design a program from "Finish to Start"



- Recyclable materials are picked up by recycling trucks from campus or delivered to the USF MRF.
- Once at the MRF, the trucks are weight and the contents are dumped onto the tipping floor, where the materials are picked up by a conveyor belt.
- Employees monitor and remove non-recyclable materials from the belts.
- As the mixed recyclables continue, a powerful magnet pull out steel, tin and metals and send them out for compacting and shipping to steel mills.
- Plastic and aluminum are separated from glass and shipped to market. Glass is crushed and shopped out for disposal.
- Cardboard, magazines and other miscellaneous paper materials are separated from newspaper and shipped out. Newspaper is baled and sent to recycling markets.
- New products are created from recycled materials, purchased by consumers and recycled again.



B. Geographical location

GHR will operate a MRF located on or within a mile of the University of South Florida Tampa campus.

C. Facilities and improvements

GHR MRF will be designed to process large volumes of recyclable material in the most efficient and cost-effective manner; handling thousands of tons of material and many types of recyclables. The design goal for the MRF is to receive, sort, process, and store recyclable material efficiently and safely. Although most recyclable material will be trucked to the facility, we will provide storage bins for citizen drop off or buy back. Depending on whether materials are delivered to the facility as mixed waste, mixed recyclables, or separated recyclable, the GHR MRF will be able to handle all predetermined recyclable materials.

Our business plan calls for GHR to lease an 18,000 sq/ft warehouse on or close to USF – Tampa Campus. The size of a facility will allow us to collect, sort, process and sell a maximum 10,000 tons per year. The current strategy of processing does not exceed this tonnage limit. The ideal location for this warehouse is a large piece of clear, uncontaminated land on the USF Tampa campus and located in an industrial area within a mile of campus. Industrial areas normally have access to utility services and to different modes of transportation, including rail, barge, and highway. Moreover, neighbors are accustomed to the volume of truck traffic that would be received by a recycling center. Also, noise associated with operation of processing and storage equipment at the recycling center should not create the type of problems that a center located in a more residential area may create. A site in an industrial area would also be properly zoned, which would avoid the need to seek rezoning or a variance as part of the site approval process. An environmental audit before acquiring the property will be completed. The following is a list of items that GHR considers cost associated with operations (See Appendix B for MRF Layout).

The Facility

- Land or Property Acquisition 18,000 Sq/ft @ \$.53
 - Landscaping, Scale & Foundation 5 Year Lease, Compactor/Baler 5 Year Lease, Sorting & Processing Line 5 Year Lease, Licenses and Fees Business licenses and taxes, Property Insurance, PPE (Safety glasses, gloves, hand trucks, etc...), Utilities (\$1.50 / ton)

GreenHom Recycling

- Transportation Costs
 - Front-End Loader 5 Year Lease, Transfer Trucks/Trailers -5 Year Lease, Forklift Trucks -5 Year Lease, Fuel Costs (3.6*Tonnage)
- Salaries
 - Recycling Coordinator
 - o Marketing Director
 - o Office Assistant, Foreman
 - o Truck Driver, and
 - Temp Employees.

As GHR continues to improve its operations processed tonnage and the quality of that tonnage will improve. Here are some graphs showing the increase of higher value materials processed over the 5 year cycle. See Appendix C for industry specifications on materials processed.







This listing is the expected market prices of materials sold to third party processors (Ed Sparks 2006) Additional information can be found in Appendix D.

Material	Value/Ton
(37) Sorted Office Paper (SOP)	\$ 85.00
(40) Sorted White Ledger (SWL)	\$ 170.00
(6) News	\$ 70.00
Mixed Paper	\$ 35.00
Corrugated Cardboard	\$ 70.00
PET - Water Bottles	\$ 340.00
HDPE Color - Detergent Bottles	\$ 530.00
HDPE Natural - Clear Milk Jugs	\$ 750.00
Aluminum	\$ 1,600.00

D. Strategy and plans

There are three major issues that will be addressed when building and designing the MRF.

- A site must be found that can accommodate the building and its associated features for traffic and storage, and be consistent with local land use.
- The building layout and equipment must be designed to accommodate efficient and safe materials processing, movement, and storage, in compliance with local building codes.
- The building must be designed to allow efficient and safe external access and to accommodate internal flow. Each of these design issues is discussed below and special considerations are highlighted.



E. Regulatory and legal issues

Much of the regulation affecting recycling is locally based rather than national. In this and all matters, GHR will pay close attention to working with local government(s) and USF whose jurisdiction we intend to operate. The company will be deeply involved with landfill regulation, tipping fees, mandates for recycled content, and economic incentives for recycling-related or environmentally-oriented businesses. We will work with the surrounding community to provide cost-effective services that can be sustained through innovative contractual arrangements (i.e. user-fee based systems, enterprise zones, franchised agreements).

1. Zoning and Land Use Considerations in Site Selection

A proposal to site a MRF may be opposed by neighbors. GHR will look for a site already zoned to allow recycling processing. If the best site available needs a zoning change or a variance, procedures to obtain the approvals will be initiated immediately. Public involvement during program development will be implemented to attain buy-in from all stakeholders. By providing for public education and input, issues that could create opposition can be recognized and resolved. Public support for the community planning effort will be fostered. A well-conceived public involvement program will assist decision makers in generating a broad consensus in favor of the proposed community approach to recycling.

2. Building Codes

Local building codes will be carefully followed when designing the GHR MRF. Basics such as the number of bathrooms, minimal working space per employee, and other requirements will be specified. Working condition rules such as minimum and maximum temperatures, air changes, and required ventilation may also influence design. Standards will be higher if developmentally disabled workers will be employed.

3. Permits

All necessary permits should be obtained before beginning the recycling operation. Contact regulatory authorities to determine if permits are needed for air and



water quality or solid and hazardous waste storage. Permits may also be needed for both intrastate and interstate transportation of recyclables, especially for overweight loads. Local governments may also have a variety of operating permits and other restrictions. Federal and state rules regarding employee and community rights to know and employee safety should be studied. Protocols for meeting these criteria and protecting employees from injury will be established. (See Appendix E)

4. General Business Regulation

Procedures for business operation, such as adequate insurance, worker's compensation, tax withholding, and social security will be developed.

5. Ordinances

As part of a recycling program, a variety of ordinances may be needed. A voluntary recycling program is always a better system. If mandatory recycling is chosen by the USF administration, some programs may require campus enforcement to induce broad compliance. To ensure that people understand what is required of them, USF will use recycling ordinances that have the force of law.

While there is no all-encompassing model for a source recycling ordinance, in general each ordinance should have the following components:

- 1. Statement of purpose: Reasons recycling is being imposed, such as saving landfill space or protecting the environment.
- 2. Applicability of the ordinance: who must separate the waste? Does the ordinance apply to both students and private businesses? Is anyone exempt?
- Items that must be separated: A definition section in the ordinance may be advisable to clarify which items must be recycled. Also, state which items "such as grass clippings or leaves" will not be accepted.
- 4. Material processing: processing requirements, such as crushing, cleaning, cap removal, bundling, or stacking in bins, should be clearly stated.



- 5. Collection procedure: For GHR's MRF, the hours of operation will normally be included in the ordinance.
- 6. Penalties: GHR will request imposing fines for noncompliance. To insure the needed tonnage to sustain the MRF anti-scavenging ordinance will be required.

The ordinance would make it unlawful for unauthorized persons to pick up recyclables from collection points. Fines for scavenging should be large enough to act as a deterrent. USF's aim is to reduce the waste stream, scavenging may not be considered a problem. However, GHR's revenue is important so efforts at discouraging scavenging will be undertaken.²³

²³ Waste Recycling and Energy, 2006 Environmental Forensic Investigations www.enviroforensics.com/wasterecycling.htm



8. Management Team

A. Organization

HR will rely heavily on Mr. Jack Mendell as the Recycling Coordinator who will lead most GHR efforts through the first phase. He will conduct all of GHR's daily operations and contact between GHR partners and associates. Two full time employees will be added at the start of year two. One of those two will lead the marketing campaign while the second will serve as an assistant to the Recycling Coordinator, and the Marketing Director. At the start of phase three, GHR will require a full complement of staff to include the Recycling Coordinator, the Marketing Director, the assistant, and nine fulltime employees to run the processing center. The remaining four members of the GHR Team, Sara Jaramillo, John O'Brien, Eric Weaver, and Larry Wu, will assist Mr. Mendell and GHR as advisors and volunteers, as well as serve on GHR's Board of Directors. Those five core members and the identified staff will execute this business plan and grow GHR into the focal point of and launching pad for USF's recycling and sustainability efforts. The resumes for these five individuals are listed in Appendix F.

GHR was nothing more than an idea when this venture opportunity surfaced. This core GHR team conducted all the necessary research, collaboration, and coordination necessary to construct this comprehensive business plan. They have worked together successfully on multiple projects over the course of twelve weeks. Their collaborative efforts have encompassed over 100 hours of collaboration and cooperation. The GHR team is confident in its ability to continue their strong working and personal relationships.

B. Key management personnel

Jack Mendell is a graduate student at USF earning a dual Masters in Management Information Systems and Entrepreneurial Studies. He earned a Bachelors of Science in Business Marketing from the University of Northern Colorado. He has also earned a certificate in Leadership Studies from USF. He has worked in the information technology field for the last 11 years. Jack is employed full time at Watkins Motor Lines



as an IT Project Lead and a Network Analyst. Jack is an excellent communicator and believes that leadership by example is the best method for exceeding team expectations.

Sara Jaramillo is a USF student currently obtaining her Masters in Business Administration with concentrations in Entrepreneurship, Marketing, and International Business. She has experience in customer service quality assurance and home loans financial services. She has served as a project quality assurance manager for the customer service department of large firms such as AT&T. She achieved the Best Quality Metrics for first Quarter 2002 on the AT&T Alternate International and Multi Cultural Programs. She has also experience with international marketing and sales in the home loan financial services. She has served clients from different parts of the world in obtaining real state properties and financial support within the State of Florida. Sara is currently employed as a Business and Economic Statistics II Teacher Assistant at USF; the same university that has fostered Sara's technical skills, public speaking and mastery on communicating complicated material in an effective manner. Sara has excellent intercultural, interpersonal, organizational and communication skills. She is proficient in Spanish, French, English and Portuguese, and currently learning German. Her experience, enthusiasm, entrepreneurial spirit, and interest in sustainability will serve GHR as an advisor and asset.

John O'Brien is a student, managerial generalist, human behaviorist, and hard worker. He has over 25 years of work experience in various fields within international, corporate and governmental industry. John's entrepreneurial career began as an 8-year old Philadelphia Inquirer Newspaper boy. Primarily John is a culturally aware and professionally trained multi-lingual interviewer, investigator, educator, auditor, and analyst. He has vast experience in executive level communications, information management, and presentations. He is currently employed full time as a Commissioned Officer in the U.S. Air Force where he operates daily in fast paced and high stress environments. John has extensive leadership experience and is well-versed in risk and threat identification, assessment, management, control, and reduction. He is an avid husband, dancer, community volunteer and involved citizen who has never been afraid to



get his hands dirty. His analytical problem solving skills, attention to detail, and strong desire for sustainability, for the sake of Mother Nature, will serve GHR well.

Eric Weaver has over 18 year's extensive experience with Stormwater Management Models (SWMM) for a wide variety of civil design studies in Florida. He BETA tested SWMM while under development at the University of Florida as contracted by the EPA and has remained involved with its development. His technical skills have been used to formulate and review the impacts of new construction. Studies for existing site owners have been able to show quantitatively that construction on adjacent waterways can directly impact their water levels. Often new land areas are submerged reducing the buildable lands. Additional proficiencies encompass skills required to prepare data for proper patent drawings, searches and application preparation. Advanced skills have resulted in detailed technical ability to solve many professional, businesses, social, educational and personal problems. He founded the first chapter student group at the University of South Florida to facilitate public service projects with volunteer students. Eric has completed multiple projects involved in the public as class credit activities. He has developed proposal documents, granting packages, slide presentations, articles of incorporation, and tax packages while founding a 501(c)(3) Public Charitable Corporation involving faculty, businesses and community members to facilitate Service-Learning projects. (STARS USA Inc.)

Larry Wu currently enrolled in the MBA program at USF. He earned his undergraduate degree in business administration from UF. He is currently employed at the Silk Flower Depot where he oversees customer service and shipping. He is verbally proficient in Mandarin Chinese and has a strong background in international business.

As stated previously, Jack Mendell is essential to the execution of this business plan. He will initially rely on current USF infrastructure to collect, sort, and broker recyclable materials. Ultimately, the aim is for GHR to accomplish all of physical plant's current recycling efforts and significantly increase the revenue generated from brokering USF scraps.



Jack Mendell will be responsible for implementation of the pilot programs. He will rely on assistance from all of the GHR Team to perform their duties on a part-time, as available, basis.

Aspects of the program include:

- Plan, develop, monitor and modify USF's recycling program
- Plan, develop, coordinate, implement, and promote GHR's and USF's recycling program through community outreach and education
- Work with business and school administrators to educate and provide technical assistance in reduction, reuse and recycling of materials
- Act as liaison with USF's Physical Plant, businesses, and USF's subcomponent organizations to promote and implement educational programs for USF's population
- Develop publicity campaigns within USF through promotional products, recycling contests, etc.
- Produce booklets and fliers to describe the recycling program and recycling opportunities and ensure their distribution to USF leadership
- Analyze studies, make recommendations, and provide assistance to USF on recycling issues.
- Recommend goals and monitor progress in recycling
- Act as liaison with recycling programs at other universities and municipalities
- Mobilize volunteers to assist GHR operations
- Develop finding sources for recycling programs
- Build and maintain positive working relationships with co-workers, USF's population and the public using good principles of customer service
- Develop enforcement methods
- Foster inter-governmental and intra-USF coordination
- Mange recycling financial considerations



• Perform related duties as determined by the Board of Directors

Additionally, volunteers and school projects can assist GHR in accomplishing the tasks listed above. Every individual in the USF population can and will be an emissary for the GHR message.

C. Management compensation and ownership

Jack Mendell will work as Recycling Coordinator with a marketing director, office assistant, foreman, truck driver and temp employees as needed. Jack Mendell will hire 1 new employee per 1000 ton additional collection (\$10/Hour).

<u>Salaries (2008)</u>			
Recycling Coordinator	\$ 70,000		
Marketing Director	\$ 50,000		
Office Assistant	\$ 30,000		
Foreman	\$ 35,000		
Truck Driver	\$ 35,000		
3 Temp Employees	\$ 62,400		
SubTotal	\$ 282,400		

 Table 7 GHR: Staff Salaries

Mr. Mendell will be accountable to the Board of Directors based on goals (tons recycled/programs success/research completed). GHR believes that execution of this business plan may generate ideas, opportunities and ventures which ultimately are profitable to enhance community support.

D. Other investors

GHR also researched funding from philanthropic donations. Some of the foundations considered by GHR include the Annenburg Foundation, the Bill and Melinda Gates Foundation, and the Getty Foundation. Most philanthropic donors including those listed require potential recipients to submit an extensive description and explanation of the business, much like this business plan. After meticulous review of this business plan by the GHR team the plan will be used to pursue philanthropic partnerships that share GHR's vision. Further research is required to identify which of those listed, in addition to others, are the best fit for GHR's philanthropic partnerships.



E. Board of directors

GHR will have a nine-member Board of Directors. Five of the remaining eight members will be Dr. Sharon Hanna-West, Sara Jaramillo, John O'Brien, Eric Weaver, and Larry Wu. The remaining three board members have not yet been identified. GHR is considering Dr. Gregory Henley, Dr. Paul Givens, Ed Sparks, a USF faculty member from the School of Engineering, and a representative from USF's Physical Plant.

F. Supporting professional advisors and services

GHR will maintain a Board of Advisors that will be initially staffed by three individuals. Al Krause has agreed to serve on the Board of Advisors; GHR is considering Dr. Gregory Henley, Dr. Paul Givens, Mr. Ed Sparks, a USF faculty member from the School of Engineering, and a representative from USF's Physical Plant.

Additionally, GHR will pursue partnerships with the following colleges and seek advisory participation from within some or all of the following colleges.

College Partnerships:

- Center for Entrepreneurship: Provide assistance in setting up and running research incubator.
- College of Business: Provide ongoing assistance with marketing, finance, PR, and future opportunities (Dr. Sharon Hanna-West will represent this capacity).
- College of Visual and Performing Arts: Find artistic or useful ways to create items from recycled material.
- College of Education: Help with an education program to expand recycling education.
- College of Engineering: Research new ways to use recycled material, alternative fuels, and recycling processes (Dr. Givens could fill this role).



- School of Architecture: Look into "green buildings." Application of Solar Energy.
- School for Management Information Systems: Build us a web site and database to track all aspects of the business.



9. Overall Schedule

GHR will enter the market in 4 phases. These phases are solicitation, construction, sustained operations, and growth stages. See Appendix G for a more detailed timeline.

Step 1: SOLICITATION

- 1) Build relationships with target market
- 2) Lobbying university administration
- 3) Grants (\$1.3M needed)
- 4) Permitting
- 5) Interns, volunteers, and university associations can donate time

Step 2: CONSTRUCTION

- 1) Marketing
- 2) Operations
- 3) Relationships
- 4) Track progress
- 5) Provide updates
- 6) Philanthropic donations

Step 3: SUSTAINED OPS

- 1) Marketing
- 2) Education facility
- 3) Learning curve
- 4) Partnerships with secondary market
- 5) Operations
- 6) Philanthropic grants
- 7) Track progress
- 8) Provide updates

Step 4: GROWTH

- 1) Increase supply of recyclables through marketing
- 2) Expand into other markets
- 3) Develop confidential shredding service for the university



MAY 2006 2008	MAY 2007	7 JANUARY	2008 AUGUST
			GPOWTH
 Relationships University administration Grants \$2M Permitting Interns, and volunteers, 	 Marketing Operations Relationships Progress Updates Donations 	 Marketing Education Learning curve Partnerships Operations Grants Progress Updates 	 Increase supply Other markets Shredding service
1 Staff member: Recycling Coordinator	3 Staff members: Recycling Coordinator Marketing Director General Assistant	12 Staff members: Recycling Coordinator Marketing Director General Assistant 9 Sorters	TBD



10. Critical Risks, Problems, and Assumptions

GHR recognizes that this undertaking has numerous risks and problems. However, GHR believes that a strong business model can lessen risk and solve problems if the extenuating factors and solutions are rooted in assumptions drawn from extensive detailed research. This strategy will provide GHR an approach for mitigating risk, solving problems, and creating value. One way of creating value is to treat each problem as opportunity.

The primary problems or opportunities that GHR anticipates are (1) USF administrative support, (2) at-the-source sorting, and (3) business sustainability. The risks inherent in this business plan are building the MRF without the necessary capacity to ensure operational efficiency. Additionally, every one of the members of the GHR team has already invested significant time and personal resources into GHR. All of the GHR members will continue to risk and sacrifice for the sake of GHR and the positive benefits it offers to the USF community. This personal risk by team members is one they make willingly. However, the other risks and problems require further analysis.

The first problem GHR is faced with is USF administrative support. This is more an opportunity than a problem because the GHR team has not formerly presented this concept to the USF administration. Thus, we do not wish to convey that the GHR team has experienced any reluctance from USF administration to support the venture. However, the GHR team recognizes that without executive level support we will likely be unable to achieve the shared goals of the organization. GHR feels that USF leadership must lead by example which is why GHR chose them to participate in the pilot program. The reasons for USF's administration not supporting this plan, although still undetermined, could potentially include the negative stigma that comes with discussing recyclables or as many will refer as trash. People in general, university administration included, don't typically like to think about or discuss trash. People desire transparency when dealing with refuse. They essentially don't want to think about nor be bothered with such topics of discussion.



However, GHR believes that the time is now to start worrying about it. GHR will request administrative support on a wide-range of issues. Initially, GHR will solicit USF administrative support of the GHR pilot program. Additionally, GHR will seek administrative support in order to attain hours of every student's time during their required orientation. Lastly, GHR will request that USF administration take an active role in executing GHR's marketing plan and assist holding accountability all of the individual building superintendents whose participation and support is vital to GHR's recycling efforts. GHR hopes to address the opportunity presented by USF's administrative support by forging strong relationships and partnerships with the President's office, Physical Plant, Student Government, and affiliated colleges and faculty to actively promote the involvement and participation by USF's administration. Administrative support is essential to show front office leadership which will assist in solving the second problem and seizing the opportunity to create value.

The second opportunity is at-the-source sorting. At-the-source sorting refers to the collection points and has two sub components. The first is motivating people to recycle while the second is educating them to recycle properly or, better stated, responsibly. The first subcomponent of getting people to recycle requires a change to the current culture of consumption, which attributes no thought to the waste generated. Raising the recycling issue into the consciousness of the USF community is required to spark people to think along sustainable lines. The second concern of getting the USF community to recycle responsibly requires every individual to accept responsibility for placing the correct items in the proper collection bin. Many people will often discard their waste, whether a recyclable material or not, into the closest and most convenient container. This short-sightedness and perceptually lazy attitude creates a mix at the collection site that will require additional processing by the GHR team. Educating the USF community to recycle properly or responsibly at the point of disposal will serve GHR greatly. By cleaning the pool from which GHR draws its raw material, GHR hopes to streamline the collecting, sorting, and processing of recyclable materials to achieve improved efficiency and economies of scale.



GHR hopes to address this opportunity presented by at-the-source sorting through its marketing and education campaigns. GHR will leverage and employ student groups willing to volunteer time to support GHR's recycling efforts. GHR will make being environmentally aware and conscious fashionable once again. GHR will also attempt, through administrative support, to utilize the grounds crew employees as our on-site inspectors to monitor which buildings and departments are executing GHR's recycling program. GHR hopes to utilize the ground crew as the foot soldier who will report to higher how well the plan is being executed.

The last and most concerning opportunity is sustainability. Unfortunately, recycling is not a financially engrossing endeavor. If the research conducted by the GHR team proved nothing else, it certainly proved to be far from profitable. People just don't care to recycle and it is still cheaper to dispose of the materials. The average member of the USF community may not understand the limited nature of resources and how the USF's collectively consumptive nature negatively affects the ecosystem. This presents a potential stumbling block to achieving sustainable operations. Grants are not expected to last indefinitely and nobody wants to be part of a losing venture. Achieving sustainability is necessary and GHR will have to develop creative financing through the solicitation of continually changing grants and philanthropic donations. GHR will attempt to form relationships and develop partnerships with strategic partners. These relations may be another means of achieving sustainability. Other options still to be considered include subsidies from local, state, and federal government.

As a team, GHR is confident that it can take advantage of these opportunities and is prepared to accept the foreseeable risk. The primary risk for this venture will present itself after USF's administration agrees in concept to executing this business plan. The risk will present itself when the GHR team must decide whether or not to construct the MRF. If the GHR partners in the surrounding community have not yet partnered with USF and GHR or if the possibility exists that they may not, the MRF's construction may be a questionable decision. This could stall the plan and any energy created. To mitigate this risk GHR must begin immediately to develop partnerships with USF, Temple



Terrace, Busch Gardens, MOSI, and all those others without first having their commitment. Those partnerships are best developed and in place before approval from USF to proceed. USF may even require it. GHR feels the best discussion point for developing those partnerships is the educational aspect of the plan.

Considerable time may be necessary to secure formal agreements so the relationship building can begin immediately. The strategic partnerships will have a serious affect our scraps tonnage and ultimately GHR's operational sustainability. Of course the ultimate risk that needs discussing is that being made by Jack Mendell. Jack is stepping out of his comfort zone to spearhead an effort that looks at times as driving through brick walls. The GHR team has confidence that if this venture is to succeed, Jack Mendell can accomplish it.



11. The Financial Plan

A. Assumptions for the Financial Statements

The assumptions that we have made regarding figures for the cost of operations and the potential profit stream are in Appendix A. These figures were obtained from the actual sources described

B. Pro Forma Income Statements

We have shown the potential income stream in relation to costs in the income statements. Our revenue stream consists of grants, donations, student fees, and the sale of recyclables. These figures were based upon industry standards. The statements are provided yearly for 2006-2012 in Appendix A.

C. Pro forma Balance Sheets

The balance sheets show our assets, liabilities, and stockholders equity semiannually for the 1st year, and annually until 2012 in Appendix A. We have minimal assets because we are leasing all of our equipment and facility. We also are a nonprofit organization, so we have little equity.

D. Pro forma cash flow analysis

The statements of cash flows are listed monthly for 2006-2012 in Appendix A. We expect to receive our grants monthly, and plan on covering our expenses, month by month. Our products, which are recyclables, will be sold for cash to processing mills.

For detailed analysis of our break even point, operating margins, and cost structure, please refer to Section 4 "The Economics of the Business," in this business plan.



12. Appendices



Appendix A Assumptions of the Pro Forma

ASSUMPTIONS OF THE PRO FORMA INCOME STATEMENTS, STATEMENT OF CASH FLOWS, AND BALANCE SHEET

- We have assumed that we can receive \$56,170.00, \$278,596.00, \$491,770.00, \$316,230.40,
 \$119,996.76, \$0.00, and \$0.00 in grants, for the first seven years, respectively. These grants will come from EPA and other philanthropic sources.
- 2) We have assumed that we can receive donations. It is difficult to assume the amount, so we have left them at zero for the financial statements.
- We have assumed that we can receive \$0.00, \$0.00, \$260,780.00, \$465,140.00, \$669,500.00,
 \$873,860.00, \$1,078,220.00 from the sale of recyclables, for the first seven years, respectively. Please refer to Appendix D for Revenues.
- 4) We have assumed that we can receive \$0.00, \$0.00, \$87,500.00, \$90,562.50, \$93,732.19, \$97,012.81, \$100,408.26 in student fees, for the first seven years, respectively. This is based on the current USF student population of 35,000 students with a \$1.00 student fee charge per semester. We calculated the fees for 1 semester and multiplied it by 2.5 to get the year end total. We expected the student population to grow by 3.5% each year. These statistics can be found on WWW.USF.EDU
- 5) We have assumed that we will hire a Recycling Coordinator for 2006, a Recycling Coordinator, Office Assistant, and Marketing Director for 2007. They will be paid \$70,000, \$30,000, and \$50,000 per year, respectively. We will have these same employees for 2008-2012, but will add a foreman (\$35,000/year) and a truck driver (\$35,000/year). Our temps will costs \$10.00/hour (including payroll taxed and insurance) and will be hired through a temporary agency. We will hire 3, 4, 4, 5, and 6 temps for 2008-2012. We expect each temp can process 1000 tons per year. This information was obtained from Ed Sparks, Recycling Coordinator at Polk County Landfill.
- 6) We have assumed that we can lease a building and property for \$185,000/ year. This includes leasing the 18,000 sq.ft. building and property for \$115,000/year. This also includes \$70,000 for scale and foundation per year. We plan on leasing the building and equipment starting 2008. This information was obtained from Ed Sparks, Recycling Coordinator at Polk County Landfill.
- We have assumed that the utilities will cost \$0.00/month, \$0.00/month, \$279.50/month, \$377.00/month, \$474.50/month, \$572.00/month and \$669.50/month for the first seven years, respectively. We have assumed it requires \$1.50/ton for utilities. This information was obtained from Ed Sparks, Recycling Coordinator at Polk County Landfill.



- 8) We have assumed that workers comp insurance will cost \$4000, \$18,000, \$30,000, \$30,000, \$30,000, \$30,000, \$30,000, \$30,000, and \$30,000 for the first seven years, respectively. It costs \$500/month for worker's compensation insurance based upon current rates from Zenith Corp. We have pro rated the amount for 2007 with 1 employee. We have 3 full time employees for 2007 and 5 full time employees for 2008-2012. This expense only applies to full time employees because we will hire part time employees through a temporary agency, which covers all taxes associated with their employees.
- 9) We have assumed that the property insurance will cost \$0, \$0, \$15,000, \$15,000, \$15,000, and \$15,000 for the first seven years, respectively. This information was obtained from Ed Sparks, Recycling Coordinator at Polk County Landfill.
- 10) We have assumed that health insurance for full time employees will cost \$200/person/month for the first seven years, respectively. These rates were obtained from the current rates at United Health Care Insurance Company for healthy individuals.
- We have assumed that supplies will cost \$333.36, \$1,000, \$1,500, \$1,500, \$1,500, \$1,500, and \$1,500
 for the first seven years, respectively. These expenses include office supplies and safety equipment.
 This information was obtained from Ed Sparks, Recycling Coordinator at Polk County Landfill.
- 12) We have assumed that transportation costs will cost \$0.00, \$0.00, \$108,050.00, \$110,858.00, \$113,666.00, \$116,474.00, and \$119,282.00 for the first seven years, respectively. We have assumed that we will lease a front-end loader, transfer trucks, forklifts for 5 years for \$100,000/year. Fuel costs are also included (3.6xTonnage). This information was obtained from Ed Sparks, Recycling Coordinator at Polk County Landfill.
- 13) We have assumed that marketing will cost \$0.00 for 2006, \$123,216.00/year for 2007-2012. Please refer to the marketing plan for detailed costs associated with marketing.
- 14) We have assumed that maintenance expense will cost \$0.00 for 2006-2007 and \$1,200.00/year for 2008-2012. We will lease our building and equipment starting in 2008. There will be no maintenance expenses for these items, since they are leased. This information was obtained from Ed Sparks, Recycling Coordinator at Polk County Landfill.
- 15) We have assumed that licenses will cost \$0.00/year for 2006-2007 and \$500.00/year for 2008-2012. This information was obtained from Ed Sparks, Recycling Coordinator at Polk County Landfill.
- 16) We have assumed that FICA (Social Security and Medicare Taxes) will cost 7.65% of full time employee wages. Our part time employees will be hired thorough a temporary agency, which will cost \$10.00 per hour. This includes payroll taxes and insurance. This information was obtained from WWW.IRS.GOV and from Ed Sparks, Recycling Coordinator at Polk County Landfill.



17) We have assumed that we will be able to pay off our liabilities at the end of each month, provided we have received our grants for 2006-2010. After 2010, we will not require any more grants and will be sustainable.





















Appendix B MRF Design and Layout

Area

The site will be large enough to accommodate the recycling building, safe and efficient traffic flow for several vehicles, and have buffer space for fencing, landscaping, signs, and other incidentals entrances and exits for trucks will be separate from those used by automobiles.



There will be enough room for tractor/trailers of 55 feet and over to park and turn safely and easily. Also outdoor storage needs for revetments, pallets, baled materials, or appliances will be available. Included will be an area for expansion.

Local land use regulations will be consulted to meet setback regulations. Likewise, some space will be set aside for fencing, signs, and landscaping. Adding trees or shrubs to the site design can will provide a buffer zone, cut down on noise, and provide an aesthetically pleasing appearance to neighbors and to citizens using the site's drop-off center.

Scale

The site will have a scale that can be used to weigh both incoming and outgoing materials. Typical scale lengths are from 60 to 70 feet. The site will also accommodate a queuing area for trucks from the entrance to the scale and from the scale to the recycling facility. To determine the queuing area, some predictions will be made of the peak vehicle traffic times, as well as the time necessary to weigh and unload an incoming vehicle.


GreenHorn will try to minimize the number of intersections and amount of cross traffic in the site design.

Building Design: The facilities' outside walls will be designed to allow safe and easy access for incoming and outgoing vehicles. It is important to design doors wide and high enough to accommodate vehicles unloading inside the building. Door damage has been a problem at many MRFs because of collisions caused by empty, but still open, trucks backing out. There will be enough doors to accommodate the expected number of trucks at normal peak times. The same is true for areas where materials will be loaded onto trailers for transport to markets.

Tipping or Unloading Area

The tipping or unloading area will be designed to accommodate at least two days' expected volume of material, although even more space would be preferable because insufficient area to handle incoming waste is a common problem for MRFs. The tipping floor will be unheated, but the design will ensure that cold air does not infiltrate the processing area. GreenHorn's MRF is expected to accept both source-separated and commingled materials. Although all recyclable material could be accommodated on one large tipping floor, designing the facility with separate areas for separated and commingled recyclables will be best. Signs will clearly indicate to each driver the proper location for material delivery.

GreenHorn's MRF will be designed to run more than one shift. With this option, sufficient storage space on the tipping floor is essential to allow for processing during the second shift. GreenHorn will process all separated material during the first shift and all commingled material during the second shift. Using multiple shifts will allow for an overall smaller facility design, although the tipping floor may need to be larger.





The tipping or unloading floor will be designed to handle heavy weights, withstand the wear caused by pushing and moving recyclables, and to provide efficient drainage for liquids brought in by trucks. Wet floors pose safety hazards for employees and create difficult working conditions. The design must also minimize glass breakage, which poses safety hazards and creates a large percentage of nonrecyclable volume. The MRF will use a sloped tipping pit or ramp to minimize jarring. Corrugated cardboard can also be placed on the tipping floor as a cushion. Reducing the number of times each load must be handled also reduces breakage. The area needed for the tipping or unloading floor can be estimated by using the material characterization data collected and converting the anticipated recyclable weights to loose volumes. Remember to account for slopes at the ends of stored material piles. By adding up the expected daily volumes of the commodities to be processed, the daily throughput for the facility can be estimated.

Sample V

After determining the types of equipment that will be used to process and compact the recyclables, a general estimate can be made of space requirements to store this material. It is that important that GreenHorn does not underestimate storage space needs. Enough storage space will be available to store materials for sufficient periods to gain high-volume prices or to account for the inability to sell some materials during market downturns.

Sample Weight to Volume Conversion Factors for Recyclables

Material	Volume	Weight in pounds
Newsprint, loose	one cubic yard	360-800
Newsprint, compacted	one cubic yard	720-1,000
Newsprint	12" stack	35
Glass, whole bottles	one cubic yard	600-1,000
Glass, semi crushed	one cubic yard	1,000-1,800
Glass, crushed (mechanically)	one cubic yard	800-2,700
Glass, whole bottles	one full grocery bag	16
Glass, uncrushed to manually broken	55 gallon drum	125-500
PET, soda bottles, whole, loose	one cubic yard	30-40
PET, soda bottles, whole, loose	gaylord	40-53
PET, soda bottles, baled	30" x 62"	500
PET, soda bottles, granulated	gaylord	700-750
PET, soda bottles, granulated	semi-load	30,000
Film, baled	30" x 42" x 48"	1,100
Film, baled	semi-load	44,000
HPDE (dairy only), whole, loose	one cubic yard	24
HPDE (dairy only), baled	32" x 60"	400-500
HPDE (mixed), baled	32" x 60"	900
HPDE (mixed), granulated	gaylord	800-1,000
HPDE (mixed), granulated	semi-load	42,000
Mixed PET and dairy, whole, loose	one cubic yard	average 32
Mixed PET, dairy and other rigid, whole, loose	one cubic yard	average 38
Mixed rigid, no film or dairy, whole, loose	one cubic yard	average 49
Mixed rigid, no film, granulated	gaylord	500-1,000
Mixed rigid and film, densified by mixed plastic mold technology	one cubic foot	average 60
Aluminum cans, whole	one cubic yard	50-74
Aluminum cans, flattened	one cubic yard	250
Aluminum cans	one full grocery bag	1.5
Aluminum cans	one large plastic grocery bag	300-500
Ferrous cans, whole	one cubic yard	150
Ferrous cans, flattened	one cubic yard	850
Corrugated cardboard, loose	one cubic yard	300
Corrugated cardboard, baled	one cubic yard	1,000-1,200
Leaves, uncompacted	one cubic yard	250-500
Leaves, compacted	one cubic yard	320-450
Leaves, vacuumed	one cubic yard	350
Wood chips	one cubic yard	500
Grass clippings	one cubic yard	400-1,500
Used motor oil	one gallon	7
Tire — passenger car	one	12
Tire — truck	one	60

Source: DRAFT National Recycling Coalition Measurement Standards and Reporting Guidelines, presented to the NRC Membership, (October 31, 1989)



Some materials can be stored outside or in trailers, depending on market specifications.

Building Structure

The building will have as few interior columns as possible. This will allow the maximum flexibility for placing equipment and accommodating future needs to rearrange the layout. The floor will be strong enough in all places to accommodate both vehicles and heavy, stationary processing equipment. The floor will also be designed to allow for anchoring equipment. Although there may be a need to design in some recyclable pits to hold various materials, keeping a flat floor space will allow for easier moving or changing of equipment.

The ceiling will also be high enough to accommodate equipment specifications. Conveying lines, air classifiers, shredders, and other processing equipment can be as tall as forty feet. For flexibility, it is just as important to have enough space vertically as horizontally.

Building Layout and Equipment Choices: Manpower versus Machines

Manual sorting is the best way to get high-quality, low-contamination loads of recyclables and experience less downtime. However, manual sorting can also be dirty, dusty, dangerous, and expensive, especially when large volumes of material must be handled. Increasingly, mechanized sorting equipment is becoming available, which may provide improved handling efficiency at an acceptable quality. This equipment is designed to receive commingled recyclables and separate the total volume into its component parts, such as aluminum cans, plastics, glass, and ferrous metals. Classifiers, using air or mechanical methods, separate light materials from heavier. Eddy currents separate aluminum cans. Magnetic belts or drums can pick off ferrous metals. Proprietary technology, such as the BRINI system, is available. New techniques include the Bezner system, which uses moving chain curtains to trap light materials like plastic and aluminum cans, while allowing denser materials, such as glass, to move through the hanging chains. Optical scanners are also being developed to sort glass by color. More technology for sorting recyclables is expected to come on the market in the near future.

Manual sorting or mechanical sorting will be based on the volume and types of materials to be handled; the economics of purchasing, operating, and maintaining the equipment versus the cost of hiring additional employees; and market requirements concerning the degree of acceptable contamination. GreenHorn's MRF will be designed to use mechanical sorting if efficient equipment is available, supplemented with manual sorting for quality control. A primary design goal will be minimizing the number of times that material must be handled as it moves through the facility.





Employee and Education Facilities

In addition to estimating space for material drop off, processing, and storage, the design must include space for employee facilities. Locker rooms, bathrooms, showers, a first aid station, an administrative office, and a weighing station will all be considered. GreenHorn's facilities will have rooms where the operation can be explained to public tour groups or for use as a lunch room. The rooms have windows overlooking the processing floor, and educational programs will be conducted safely and quietly.

Local building codes will be consulted to determine work place minimum environmental standards. If employees are to be drawn from a specialized work force, such as developmentally disabled individuals or the handicapped, special regulations may apply. A shop for housing tools and maintaining equipment will also be part of the design.

Hazardous Materials Area

GreenHorn's MRF will be designed to accept household hazardous waste or waste oil but will phase in the acceptance of the material after certain milestones have been achieved. To accept household hazardous waste or waste oil, a special area will be designed according to local, state, and federal requirements. Hazardous waste, medical waste, low-level radioactive waste, and other hazardous chemicals may be found in incoming loads. A protocol for handling this material will be established.



Conveyor Line

Handling efficiency for a MRF is greatly enhanced by using conveyor lines to move waste from the tipping area through processing. Conveyor lines will be used for transporting materials to mechanical equipment and act as moving lines that allow workers to separate various commodities. A conveyor line will be designed to allow an employee to be standing upright or seated while separating materials. If an employee must bend over or stand in an uncomfortable position, injuries will result. Likewise, the line should be designed to keep employees from snagging clothes or receiving injuries while sorting. Emergency shut-off cords and palm-size panic buttons should be included with conveyor systems. A positive sorting line will be used due to low contamination levels accepted by markets. In a positive sorting, recyclables are picked from the conveyor and placed in storage containers allowing for nonrecycled materials to fall into a bin at the end of the conveyor belt for disposal.

Processing and Densifying Equipment

For small operations, collected recyclables can be stored loose in Gaylord boxes and sent to market. Gaylord Boxes are reusable tri-wall corrugated cardboard shipping and storage boxes that are typically open to approximately 48" x 48" 48". The feasibility of this option depends on local markets and transportation costs. Greenhorn Recycling will use processing and densification equipment in order to increase the price paid by a market or to lower unit transportation costs by maximizing the volume in each load. Decisions about buying processing equipment depend on the volume of material that will be handled and especially on the requirements of the markets. Some markets want to receive material baled, some shredded, others loose. Some markets will accept waste in a variety of forms, but will pay different prices for each. Processing equipment will be selected carefully for the facility to meet its particular processing requirements. The capital and operating costs, along with space requirements, must be balanced against the improved marketability and revenue that processing will bring. Balers are usually the most versatile piece of processing equipment that recycling centers use. Balers will be used to densify many types of materials including paper, cardboard, plastic, and cans. Using a baler facilitates stacking bales, which improves space utilization and reduces material transportation costs. Balers come in a variety of sizes and prices. For industrial markets, large bales (600-1200 pounds, 30-40 inches wide) are the norm. GreenHorn have one heavy-duty baler for all paper materials and one or more medium-duty baler for cans and plastics. A baler to be used for PET bottles can be fitted with a perforator, thereby eliminating the need to manually remove caps from the bottles before baling. Balers for paper materials will be equipped with a swing-out ruffler that can be engaged when baling newspapers to increase bale density. Shredders and chippers can be used for newsprint (for animal bedding), mixed paper, plastic bottles, and confidential documents. The market will determine whether a shredder is needed or, in the case of plastics, acceptable. Shredders and chippers should be equipped with safety protections, including dust control.

Other specialty equipment like can flatteners can also provide improved densification.



Handling Equipment

GreenHorn Recycling's MRF will need methods of moving materials from the tipping area to storage and from storage to transport vehicles. Fork-lift trucks to move baled material will be a must. Front-end loaders are also used to move loose materials such as paper, glass, and cans. For air quality purposes, propane or electric fork-lift models will be used through out the whole facility. The MRF design will allow sufficient aisle space for efficient and safe movement of materials. Handling equipment must have sufficient room to move from processing to storage areas, without the need to make tight turns or to cross flow paths used for moving other materials. The traffic pattern will also allow for rapid loading and unloading of vehicles.

When making decisions about processing, handling, and densification equipment, it will be important to consider the life cycle cost for this equipment. In addition, factors such as the capacity of the machine, whether it is continuous feed or batch feed, its reliability record or servicing needs, and energy requirements are all important. Likewise, the space needed for equipment and the required loading and unloading areas will be considered.

Redundancy

It will be important to include redundancy in equipment processing capability where possible. Equipment failure in one area of the GreenHorn MRF should not cause the entire operation to shut down. Although cost and space requirements will prevent having two of everything, developing multiple sorting lines and alternative handling methods will make the system less prone to shut down. The equipment will be placed so that both routine and special maintenance can be performed easily and without disruption to other MRF functions.



Appendix C Scrap Specifications

Scrap Specifications Circular 2005 Institute of Scrap Recycling Industries, Inc.

Paper(37) Sorted Office Paper (SOP) Consists of paper, as typically generated by offices, containing primarily white and colored groundwood free paper, free of unbleached fiber. May include a small percentage of groundwood computer printout and facsimile paper. (39) Manifold Colored Ledger (MCL) Consists of sheets, shavings, and cuttings of industrially-generated printed or unprinted colored or white groundwood-free paper. All stock must be uncoated and free of nonimpact printing. A percentage of carbonless paper allowable. Prohibitive materials may not exceed..... 1/2 of 1% (40) Sorted White Ledger (SWL) Consists of uncoated, printed or unprinted sheets, shavings, guillotined books, and cuttings of white groundwood-free ledger, bond, writing, and other papers which has similar fiber and filler content. Prohibitive materials may not exceed..... 1/2 of 1% 42) Computer Printout (CPO) Consists of white groundwood free paper in forms manufactured for use in data processing machines. This grade may contain colored stripes and impact or non-impact (e.g. laser) computer printing, and may contain no more than 5% groundwood in the pack. All stock must be untreated and uncoated. Prohibitive materials.....None permitted (6) News

Consists of newspaper as typically generated from news drives and curbside collections.



Prohibitive materials may not exceed1%		
Total Outthrows may not exceed		
(10) Magazines (OMG)		
Consists of coated magazines, catalogues, and similar printed materials. May contain a		
small percentage of uncoated news-type paper.		
Prohibitive materials may not exceed1%		
Total Outtrows may not exceed		
(12) Double Sorted Corrugated (DS OCC)		
Consists of double sorted corrugated containers, generated from supermarkets and/or		
industrial or commercial facilities, having liners of test liner, jute, or kraft. Material has		
been specially sorted to be free of boxboard, off-shore corrugated, plastic, and wax.		
Prohibitive materials may not exceed1/2 of 1%		
Total Outthrows may not exceed		
(23) Telephone Directories		
Consists of clean telephone directories printed for or by telephone directory publishers.		
Prohibitive materialsNone permitted		
Total Outthrows may not exceed1/2 of 1%		

Platics

P-100 Series' PET P-100 PET Mixed BottlesP-101 PET Clear Soda BottlesP-102 PET Green Soda BottlesP-103 PET Mixed Clear & Green

Soda Bottles P-104 PET Custom Bottles P-110 PET Mixed Rigid

Containers P-200 Series' HDPE P-200 HDPE Mixed Bottles P-201 HDPE Natural Bottles



P-202 HDPE Pigmented Bottles

AluminumTaldon

BALED ALUMINUM USED BEVERAGE CAN (UBC) SCRAP

Shall have a minimum density of 14 pounds per cubic foot (225kg/m3), and a maximum density of 17 pounds per cubic foot (273kg/m3) for unflattened UBC and 22 pounds per cubic foot (353kg/m3) for flattened UBC. Size: Minimum 30 cubic feet (.85 m3), with bale range dimensions of 24" to 40" (61 to 132 cm) by 30" to 52" (76 to 132 cm) by 40" to 84"(102 to 213 cm). The only acceptable tying method shall be as follows: four to six 5/8" (1.6 cm) x .020" (5 mm) steel bands, or six to ten #13 gauge steel wires (aluminum bands or wires are acceptable in equivalent strength and number). Use of skids and/or support sheets of any material is not acceptable. Must be magnetically separated material and free of steel, lead, bottle caps, plastic cans and other plastic, glass, wood, dirt, grease, trash, and other foreign substances. Any free lead is basis for rejection. Any and all aluminum items, other than used beverage cans, are not acceptable. Variations to this specification should be agreed upon prior to shipment between the buyer and seller.



Appendix D Revenue Calculations





Appendix E Regulations

CHAPTER 62-722 REGULATION OF RECOVERED MATERIALS

62-722.100 Purpose, Scope and Intent. (Repealed)

62-722.200 Definitions.

62-722.300 Exemptions.

62-722.400 Procedures for Certification and Reporting.

62-722.500 Revocation of Certification. (Repealed)

62-722.600 Procedures for Registration and Reporting.

62-722.900 Forms. (Repealed)

62-722.200 Definitions.

In addition to applicable definitions in Rule 62-701.200, F.A.C., the following words, phrases, or terms as used in this chapter, unless the context clearly indicates otherwise, shall have the following meanings: (1) "Amount of recovered materials" means the amount of the types of recovered materials received by a certified person or a registrant, measured in short tons (2,000 pounds equals one short ton).

(2) "Certified person" means any person who handles, purchases, receives, recovers, sells or is an end user of recovered materials, reports to, and is certified by the Department pursuant to this chapter. A person whose activities are limited strictly to the transportation of recovered materials is not considered to be a person who handles, purchases, receives, recovers, sells or is an end user of recovered materials.

(3) "Department" means the Department of Environmental Protection.

(4) "End User" means a person who makes a product utilizing recovered materials as a raw material in place of, or in addition to, virgin raw materials and who receives more than 600 tons per year of recovered materials from persons in Florida who are not certified.

(5) "Exempt Generator" means:

(a) any person who produces recovered materials; and

(b) annually transfers all of its recovered materials to a person who is certified by the Department pursuant to Rule 62-722.400, F.A.C., or who annually transfers an amount of recovered materials less than 600 tons to any combination of in-state persons who make a product utilizing recovered materials as a raw material in place of, or in addition to, virgin raw materials, or to persons out of this state.

(6) "Materials recovery facility" means a solid waste management facility that provides for the extraction from solid waste of recyclable materials, materials suitable for use as a fuel or soil amendment, or any combination of such materials.

(7) "Nonexempt Generator" means:

(a) any person who produces recovered materials; and

(b) annually transfers an amount in excess of 600 tons of recovered materials to any combination of in-state persons who make a product utilizing recovered materials as a raw material in place of, or in addition to, virgin raw materials, or to persons out of this state.

(8) "Person" means any and all persons, natural or artificial, including any individual, firm, or association; any municipal or private corporation organized or existing under the laws of Florida or any other state; any county of this state; and any governmental agency of this state or the Federal Government.

(9) "Recovered materials" means metal, paper, glass, plastic, textile, or rubber materials that have known recycling potential, can be feasibly recycled, and have been diverted and source separated or have been removed from the solid waste stream for sale, use, or reuse as raw materials, whether or not the materials require subsequent processing or separation from each other, but does not include materials destined for any use that constitutes disposal. Recovered materials as described above are not solid waste.

(10) "Recovered materials processing facility" means a facility engaged solely in the storage, processing, resale, or reuse of recovered materials. Such a facility is not a solid waste management facility if it meets the conditions of Section 403.7045(1)(f), F.S.

(11) "Registrant" means any certified recovered materials dealer who is registered with and reports to a local government pursuant to the requirements of this chapter. A person whose activities are limited strictly to the transportation of recovered materials are not considered to be a person who handles, purchases, receives, recovers, sells or is an end user of recovered materials.



(12) "Small quantity" means an amount less than 600 tons per year of the total amount of all recovered materials handled, purchased, received, recovered, sold or used by a person.

(13) "Source separated" means the recovered materials separated from solid waste where the recovered materials and solid waste are generated. The term does not require that various types of recovered materials be separated from each other and recognizes de minimis solid waste, in accordance with industry standards and practices, may be included in the recovered materials.

(14) "Type of recovered materials" means old newspaper (ONP), old corrugated containers (OCC), high grade/office paper, mixed paper, plastic bottles, all other plastic, aluminum cans, other non-ferrous, steel cans, other ferrous (other than used oil filters), glass, rubber (other than waste tires) and textiles. - 786 *Specific Authority 403.061, 403.704, 403.7046 FS. Law Implemented 403.703, 403.704, 403.7046 FS. History–New 1-1-95*

62-722.300 Exemptions.

(1) The following persons are exempt from the requirements of this chapter:

(a) Exempt generators; and

(b) Persons who handle, purchase, receive, recover, sell or use recovered materials in small quantities.

(2) For purposes of Section 403.7046(3)(b), F.S., persons who are exempt from or otherwise not subject to the requirements of this chapter shall not be required by any local government to provide a copy of any certification under this chapter to a local government.

(3) Persons whose activities involve handling, purchasing, receiving, recovering, selling or end using waste tires and who are regulated by the Department pursuant to Chapter 62-711, F.A.C., are not required to report information regarding such waste tires pursuant to this rule chapter.

(4) Persons whose activities involve handling, purchasing, receiving, recovering, selling or end using used oil filters and who are regulated by the Department pursuant to Chapter 62-710, F.A.C., are not required to report information regarding such used oil filters pursuant to this rule chapter.

Specific Authority 403.061, 403.7046 FS. Law Implemented 403.7046 FS. History-New 1-1-95, Amended 12-17-96.

62-722.400 Procedures for Certification and Reporting.

(1) Beginning January 1, 1995, any person in this state who handles, purchases, receives, recovers, sells or is an end user of recovered materials must annually apply for certification to the Department, no later than April 1, and beginning January 1, 1996, annually report to the Department, not later than April 1 of each year, certain information for the preceding calendar year, unless such person is exempt pursuant to Rule 62-722.300, F.A.C., or is otherwise not subject to the requirements of this chapter. This report shall include the following information:

(a) Name, address, and phone number of the applicant;

(b) The locations of all recovered materials facilities owned or operated by the applicant;

(c) The amount and type of recovered materials, by county of origin, that are handled, purchased, received, recovered, or sold by the applicant;

(d) The amount and disposal site, or the name of the person with whom such disposal was arranged in the event that the applicant cannot reasonably determine amount or disposal site, of any solid waste generated by the applicant's facilities; and

(e) The total amount of recovered materials received at the facility from both certified and non-certified persons.

(2) Non-exempt generators of recovered materials who transfer more than 600 tons per year of recovered materials out of Florida or to in-state persons who make a product utilizing recovered materials as a raw material in place of, or in addition to virgin raw materials, must report the amount and type of recovered materials handled, purchased, received, recovered or sold out of state or to in-state persons who make a product utilizing recovered materials as a raw material in place of, or in addition to, virgin raw material in place of, or in addition to, virgin raw materials, for the preceding calendar year, for purposes of paragraph (1)(c), above.

(3) The information specified in subsection (1) above shall be provided by the applicant on Form 62-701.900(23), F.A.C., and shall be accompanied by an annual \$50.00 certification fee.

(4) Information reported to the Department by an applicant for certification or to a local government by a registrant pursuant to Section 403.7046(1),(2) or (3), F.S., which if disclosed would reveal a trade secret, as defined in Section 812.081(1)(c), F.S., is confidential and exempt from the provisions of Section 119.07(1), F.S. Such information includes the information identified in paragraphs (1)(b)-(e) and (2), as represented by the applicant through his signature on the reporting form, unless the applicant for certification or the



registrant marks the information as nonconfidential and by so marking the information as nonconfidential represents to the Department that it has not treated such information as trade secret information. For reporting or information purposes, the Department or a local government may provide this information in such form that the names of the persons reporting such information and the specific information reported is not revealed.

(5) If the Department determines that the information received pursuant to subsections (1) and (2) is accurate and complete and meets the requirements of this rule, and is accompanied by the appropriate fee, the Department shall issue a certification to the applicant, which shall include the following information:

(a) The certified person's name, address and phone number; and

(b) The locations of the recovered materials facilities owned or operated by the certified person.

(6) Certifications shall be valid from July 1 of the year in which the certification is issued through June 30 of the following year, unless suspended or revoked by the Department.

(7) A certification issued under this rule is considered a license for purposes specified in Section 120.60,

F.S. Any person is subject to having its certification suspended or revoked, pursuant to Section 403.087, F.S., upon a finding by the Department that the person:

(a) Submitted false or inaccurate information to the Department in the certification or reporting forms;

(b) Refused lawful inspection, conducted by the Department pursuant to Section 403.091, F.S.; or

(c) Failed to submit any report required pursuant to this chapter. - 787

(8) The Department shall not delegate its authority to conduct its inspections made pursuant to this chapter to any local pollution control program, county, municipality, or any combination thereof.

Specific Authority 403.061, 403.704, 403.7046 FS. Law Implemented 403.705, 403.7046 FS. History–New 1-1-95, Amended 12-17-96.

62-722.600 Procedures for Registration and Reporting.

(1) Beginning January 1, 1995, any person in this state who handles, purchases, receives, recovers, sells or is an end user of recovered materials must register with a county, or municipality with a population greater than 35,000, which has established a registration process in accordance with Section 403.7046, F.S., and this chapter, in which the registrant is located, unless such person is exempt pursuant to Rule 62-722.300, F.A.C., or is otherwise not subject to the requirements of this chapter. All counties, and municipalities whose population exceeds 35,000, if such local governments elect to establish a local reporting process pursuant to Section 403.7046(3)(b), F.S., shall be limited, with regards to recovered materials only, to the registration process, the reporting format and reporting frequency established by this rule.

(2) Registrants shall report on a quarterly basis to such local governments, information for the preceding quarter, not later than 90 days after the ending date of each quarter, and shall include only the information required in Rule 62-722.400(1) and (2), F.A.C., for the preceding quarter. Quarters shall begin January 1, April 1, July 1, and October 1. The first report shall be for the quarter beginning July 1, 1995, and shall be due on or before December 31, 1995. This reporting requirement may be met by a registrant if the required information is provided to the local government on the forms promulgated by the Department in Rule 62-722.900(1), F.A.C.

(3) Beginning January 1, 1995, a county, or a municipality which has a population greater than 35,000, which does not elect to establish a registration process pursuant to Section 403.7046 (3)(b), F.S., may notify the Department in writing, by April 1 of each year, that it wishes to receive the quarterly report described in this rule from certified persons doing business in, or receiving recovered materials from, the territory of the requesting local government. The Department, upon receipt of the timely written notification from such a local government, shall provide written notice to the certified persons doing business in, or receiving recovered materials from, the territory of the requesting local government that, effective upon the certified person's receipt of the Department notification, the certified person must submit the quarterly reports described in this rule to the requesting local government in the manner specified in paragraph (2) above.

Specific Authority 403.061, 403.7046 FS. Law Implemented 403.7046 FS. History-New 1-1-95, Amended 12-17-96.



Appendix F Management Staff Resumes

Jack E. Mendell

6716 Hatcher Rd ♦ Lakeland, FL 33811 (C) 863-559-6027 ♦ (H) 863-647-9930 jmendell@tampabay.rr.com

Professional Experience Watkins Motor Lines, Inc. Lakeland, Florida Project Lead - LAN / WAN Network Analyst

August 97 to Present

Manage computer networks in 150 locations nationwide and Canada. This includes Cisco Routers, Switches, PCs, printers, CSU/DSUs, Access Points, and wireless networks while managing multiple IT projects.

- Project Lead for new company integration, Active Directory, and enterprise consolidation projects
- WML Corporate Intranet Development Committee member using Microsoft Share Point 2003
- Network Liaison between Windows Server Group and Data Communications
- Establish and Maintain Service Level Agreements (SLA) for network performance monitoring
- Improved employee production by installing Wireless Access Points in 30 remote locations
- Documented and standardized multiple computer network designs
- Increased departmental knowledge by coordinating and hosting Brown Bag technology lunches

LAN/ WAN Network Administrator

Configured and install devices on a frame-relay network backbone in 130 locations nationwide. This includes Cisco Routers, Switches, PCs, printers, CSU/DSUs, Access Points, and wireless networks while managing multiple IT projects.

- Increased network flexibility by installing wireless routers, PCs and print servers in remote locations
- Increase functionality of network by converting 450 workstations from token-ring to 10base T Ethernet
- Installed and punched down over 450 Cat 5 network LAN drops at Griffin Road Campus

Electronic Commerce Programmer Analyst

Business Communication Liaison between 5,000 Watkins customers and the IT Department by providing customer reports using HTML, Spreadsheets, Fax, or Dial-up mediums

- Solved internal and external problems while supporting EC/EDI software and hardware systems
- Enhanced customer service process by creating databases using Access97
- Tested and deployed Cypress Report Distribution Software
- Expanded service to customers by creating department intranet web site



NT Client/Server Administrator

Supported 90 NT Workstations on Novell and NT network

- Reduced department overhead by cloning 90 new Gateways PC in 2 months
- Trained new hires and end-users on hardware and software applications
- Administrator of Novell and NT servers.

Hewlett-Packard Ft. Collins, Colorado

January 97 to July 97

PC Support Specialist

• Configured, moved, and installed HP PCs on an Ethernet network

University of Northern Colorado Greeley, Colorado January 95 to December 96 Computer Lab Technician

• Solved all problems with workstations, applications, and printers for students and faculty

Education

Masters in Management Information SystemsAnticipated Graduation - Spring 2007University of South Florida Tampa, FloridaCurrent GPA - 4.0Classes:Advanced Systems Design and Analyses - Fall 2005Organizational Behavior - Fall 2005Business Plan Development - Spring 2006New Venture Formation - Spring 2006Advanced Database Design - Summer 2006

Bachelor of Science in Business Administration - Marketing 12/1996

University of Northern Colorado Greeley, Colorado GPA - 3.2

- Certificate in Leadership Studies University of South Florida Lakeland, FL 5/2004
- Mastering TCP/IP Global Knowledge Orlando 7/05 CWENT (Implementing CiscoWorks for Enterprise LAN/WAN Management 2.5) 8 /2005 Atlanta, GA CCNA Certification - Cisco Network Academy Polk Community College Winter Haven, Florida 2/2001
- Windows NT Workstation and NT Server Training Data Flex Orlando, Florida 9/1998

Other

- Intercollegiate MBA Business Case Competition Spring, 2006 1st Place Team Company: AirTran Holdings, Inc
- USF MBA Business Case Competition Fall, 2005 1st Place Team Company: Chico's FAS, Inc.
- Marketing Support for P.M. Soccer Enterprises
- Event Marketing and Web design www. Socceronthebeach.com Lakeland, FL 2004 to 2006
- Officer (Member at Large) Lakeland Adult Soccer Organization -LASO
- Event/League Marketing and Web design www. Lakelandadultsoccer.com Lakeland, FL 2003-2006
- Network Administration/Programming Advisory Board Florida Technical College 2001-2003



Sara Jaramillo

13504 Avalon Heights Blvd Apt 504; Tampa Fl 33613; (813) 691-2246 ;

sari_j_79@yahoo.com

EDUCATION Bachelor of Arts in International Business and Marketing Minor in Economics University of South Florida

Associate in Arts Broward Community College

EXPERIENCE

12/04-Present International Marketing & Sales Manager, Simon Finances Tampa, Fl

- Serves as day-to-day liaison with clients to ensure successful and timely completion of contracts in and outside the United States
- Deliver presentations and pitches to potential clients
- Plan, coordinate, direct and implement Marketing Strategies

• Create and oversee implementation of a marketing plan designed to increase market share

08/03-Present Professor's Assistant, Business and Economics Statistics II, USF Tampa, FL

- Communicated class material to students and assist professor in many related courses
- Taught college-level classes (of more than 100 students) independently and led students in regression analysis projects
- Fostered technical skills, public speaking qualities and mastery on communicating complicated material in an effective manner

2001/2002 Project Quality Assurance Manager, Technion Communications Tamarac, FL

- Supervised 10 Quality assurance representatives in Tamarac Florida and 5 Quality Assurance representatives in Colombia
- Conducted monitoring sessions with AT&T and Quality Assurance representatives in all call centers to assure uniformity in the quality of the calls
- Responsibilities required constant monitoring of call traffic, detecting and documenting technical difficulties, and completing daily reports for the company and for AT&T.
- Achieved the Best Quality Metrics for first Quarter 2002 on the AT&T Alternate International and Multi Cultural Programs

SKILLS

- Excellent interpersonal, organizational and communication skills
- Proficient in Spanish, French, English and Portuguese (Read, Write and Speak)
- Computer skills: Word, Power Point, Excel, Microsoft Project, Statistix 8

HONORS AND MEMBERSHIPS

- Scholarship, College of Business Administration, Latin Caribbean Program
- Member, Beta Gamma Sigma Honor Society

ADDITIONAL

- Licensed Florida Mortgage Broker
- Participated in the USF COBA Summer Program in France May 2004

December 2004

August 2002



John Burton O'Brien

813 903-8444; 15114 Deer Meadow Dr. Lutz, FL 33558 jobnoonan@yahoo.com

OBJECTIVE

To positively contribute my skills and talents to the organizational pursuit of mission accomplishment

SUMMARY OF QUALIFICATIONS

Masters in Business Administration student, managerial generalist, human behaviorist, and hard worker. Over 25 years of work experience in various fields within entrepreneurial, international, corporate and governmental industry. Began entrepreneurial career as an 8 year old Philadelphia Inquirer Newspaper boy. Vast experience in executive level communications, coordination, information management, logistics and presentations. Primarily a professionally trained and culturally aware, multi-lingual interviewer, investigator, educator, auditor, and analyst. Currently employed full time as a Commissioned Officer in the U.S. Air Force and operate daily in fast paced and high stress environments. Extensive leadership experience in risk and threat identification, assessment, management, control, and reduction. Avid husband, dancer, community volunteer and involved citizen who has never been afraid to get his hands dirty. Analytical problem solving skills, attention to detail, and strong desire for sustainability, for the sake of Mother Nature, will assist GreenHorn Recycling in an advisory role.

EMPLOYMENT HISTORY

Intelligence Officer: Analytical Team Chief HQ U.S. Special Operations Command (USSOCOM) MacDill AFB, FL

Lead current-intelligence analytical team responsible for monitoring threats to the United States and its interests throughout North and South America. Team identifies threat information, formulates collection requirements to exploit intelligence gaps, assists in operational planning, and provides expertise to the Commander of the Center for Special Operations, USSOCOM. Coordinate and interface with national agency counterparts to effectively prosecute the Global War on Terror for the Department of Defense. Construct, provide, and facilitate executive level communication sessions and presentations.

Independent Consultant: CACI and VMW and associates

U.S. Government Contractors

Mentor, train, and lead Counterintelligence/Human Intelligence (HUMINT) Collection Teams in the conduct of interrogations, source operations and debriefing force protection teams, intelligence sources and allied forces. Train reporting of collected intelligence and the establishment of liaison relationships with local, state, federal and international officials. Develop scenarios for Operations Iraqi and Enduring Freedom contingency operations training. Educate the Operational Management Team responsible for the operational management of numerous Collection Teams.

Intelligence Officer: Intelligence Watch Officer U.S. Special Operations Command MacDill AFB, FL September 2004-January 2006

February 2006-Present

October 2005-Present



Led the monitor of terrorist threat indications and warning information for USSOCOM. Constructed and delivered daily briefings, information papers and other products to the Commander for USSOCOM, Center for Special Operations (CSO) Director, distinguished visitors, and their respective. Trained and mentored senior watch officers and support personnel. Edited analytical products and briefings prior to national level agency dissemination. Analyzed terrorist organizations and their globally operational networks. Hand-picked to brief U.S. Department of State's Counter-terrorism (CT) Coordinator.

EDUCATION

- Masters of Business Administration, University of South Florida, Tampa, FL, May 2007-Estimated completion
- Coursework (Entrepreneurship, Government and Business, International Business, and Sustainability)
- Graduate, Spanish, Defense Language Institute, Monterey, CA, September 1997
- Consistently scored over 2+ on the Defense Language Proficiency Test (Spanish)
- Bachelors of Science, Criminal Justice (Psychology Minor), West Chester University, West Chester, PA, May 1994

AWARDS & CERTIFICATES

- Franklin Quest Time Management, Philadelphia, PA, February 1995
- U.S. Army Airborne School, Fort Benning, NC, April 1998
- Quito Spanish Academy-Advanced Level, Quito, Ecuador, September 1998
- U.S. Army Achievement Award, Selected as Group VII Trooper of the Month, February 1999
- U.S. Army Achievement Award, Performance as a Strategic Debriefer, June 1999
- Primary Leadership Development Course, Fort Bragg, NC, September 1999
- Survival, Evasion, Resistance and Escape School (SERE), Fort Bragg, NC, Mar 2000
- U.S. Army Achievement Award, Performance as Operations Control Elemen, August 2000
- Combat Lifesavers Course, Camp Dobol, Bosnia, Republic of Serbia, January 2001
- U.S. Army Achievement Award, Performance as the NCOIC of Tactical HUMINT Team, April 2001
- Human Intelligence Collector Basic Non-Commissioned Officer's Course, Fort Huachuca, AZ, June 2001
- U.S. Army Commendation Medal, Performance while assigned to the 82nd Airborne Division, January 2002
- Dynamics of International Terrorism Course, MacDill AFB, FL, May 2003
- Asymmetric Warfare Intelligence Analysis Course, MacDill AFB, FL, March 2004
- Mid-East Orientation Course, MacDill AFB, FL, April 2004
- Joint Service Achievement Medal, Performance as enlisted member of USSOCOM, November 2004
- Fundamentals of Analysis Course, MacDill AFB, FL, September 2005



Eric R. Weaver

2008 E. Patterson St. Tampa FL 33610 813-237-3705 (home) 813-679-5195 (mobile) eweaver@tampabay.rr.com

REPRESENTATIVE PROJECTS

- Multiple SWMM studies completed for litigation in water rights, and land use disputes throughout Florida;
- Hillsborough River Developed proposed conditions of SWMM basin study for Central River Systems;
- Alafia River Created SWMM basin study for North Prong, South Prong and English Creek;
- Anclote River Modeled for FEMA floodway no rise certificate through Hec2 analysis;
- Hillsborough County Stormwater Management Manual was recompiled with new requirements developed from Florida State guidelines, other local cities and negotiations with engineers developing in the region.
- Allen's Creek Watershed Management Plan EPA Storm Water Management Model (SWMM) and Water Quality Analysis Program (WASP4) was linked to complete the first Florida watershed waterbody Model established using an ArcInfo GIS database.
- Mannengon Hills; A resort community in the Territory of Guam \$1.5 billion 1300acre residential hillside development which included 10 million cy earthwork, 100 retaining walls, 35 bridges, 15 miles of roadway & 45 holes of gulf.
- Gardinier Phosphate Plant Engineered design, construction plans and EPA SWMM Storm Water Management Model
- Completed first county web site
- Beta tested EPA SWMM Version 4.05 & 3.01

EMPLOYMENT HISTORY

- 99 to present Self-Employed independent consulting contractor
- 92 to 99 -- ENGINEER II, Hillsborough County
- 91 to 92 -- PROJECT ENGINEER, Reynolds, Smith and Hills, Inc. 1715 N. Westshore Blvd., Suite 500 Tampa, FL
- 90 to 91 -- MODELING ENGINEER, Dames & Moore, Inc. One N. Dale Mabry Hwy., Suite 700 Tampa, FL
- 88 to 90 -- DESIGN ENGINEER, Various Small Engineering
- 8/82 to present -- PROJECT DIRECTOR, STARS USA Inc. (Students Taking an Active Role in Society)

PROFESSIONAL CREDENTIALS

- Bachelor of Science Civil Engineering, University of South Florida, 1997
- Bachelor of Science Engineering, University of South Florida, 1988.

WEB SITES

- http://home.tampabay.rr.com/engineer/professional.htm
- http://www.starsusa.org/

CONSULTING PRICE LIST

• http://home.tampabay.rr.com/engineer/



Larry Wu

1704 Bermuda Ct. Safety Harbor, FL 34695 Home Phone (813)727-4903 Email LARRYWU1@HOTMAIL.COM

SUMMARY

My most valuable attributes are organization skills and inititative. I am currently in the MBA program at the University of South Florida.

WORK HISTORY

2004-Current

General Manager, Silk Flower Depot

- Implemented an inventory system to increase efficiency
- Increased sales using effective internet marketing
- Boosted overall ranking of web site
- Operates the shipping department

EDUCATION

- 2000-2003 B.A. Business Administration specializing in Health Science Education, University of Florida
- 1999-2000 Transeferd to the University of Florida, Kettering University



Appendix G Timelines

This section will include all the timeline for the project







Appendix H Thank You and Acknowledgments

GreenHorn Recycling Classmate Review

First off, I would like to commend your team on a very thorough business plan. I can tell that a lot of time and effort was placed on ensuring that a complete plan was put together. As with anything there is always room for improvement and I hope that I can offer some useful constructive criticism. The following bullets will outline the few areas that could be tweaked to improve the strength of this business plan.

- Starting on page 5, I wasn't sure who the "you" was when reading this plan. I later concluded that it must be your client Dr. Sharon Hannah-West. "You" should be replaced with USF or some other specific entity so that it is clearer to the reader.
- On page 15, in the last portion of section B., point 3 is not clear. I'm not sure what the "initiated outside funding sources" are. If you are referring to the funding from point 2, then combine both of those points into one clear point.
- In the same section, point 4 mentions a \$2 million grant. Where do you expect to get this free money and why is \$2 million the quoted figure (why not \$1 million or \$3 million)?
- In the next section C., what does "easy source" mean in the first point?
- On page 16 you first introduce the MRF. My first thought when I read this was whether or not this facility would be on or off USF's main campus. I think you touch on this later, but I don't recall a recommendation for a specific location. Location is hugely important for this plan because it affects both the aesthetics of USF's beautiful campus but also transportation costs associated with moving refuge to and from this location.
- Later on page 16, it is mentioned that value can be added to recyclable material with this MRF facility. But does this added value outweigh the cost to create it?
- On page 18, point 2 what is C&D?
- Page 19, "USF has... students coming...from all over the country/world" What is the significance of this point?
- Page 19 next paragraph mentions 3 groups (I assume are students, faculty, and staff). I didn't recall how these were separate market segments and how they would be approached with separate marketing campaigns.
- On page 27, the marketing plans that "GHR will concentrate on one or two materials". That is rather vague considering the scope of this plan. There should be a recommendation on which materials would be approached first. This recommendation could be based on profitability, consumption, or initial set up cost to process that specific material.
- On page 31 the Education and marketing budget lists a zero cost for several items. What do these projects cost in man hours, and other resources? If it is truly a zero cost operation, why is it not currently implemented?



- Page 34 Section D, again \$2 million pops up out of the blue without any justification or explanation.
- Page 36 Section B, Have you researched possible sites? What are pros and cons of each?
- Page 39 last paragraph, Good info! Does USF have opportunity to assist Hillsborough County in becoming the first county to meet 50% goal in all categories? If so, a great opportunity for notoriety which could result in more grant funding.
- Page 44, A lot of responsibility for Jack. Also, clearly defined. However my concern as a possible investor is will he get spread too thin and not be as effective as needed to accomplish all goals? You do mention his work ethic and that he will have an assistant. Both are good defenses, but still a concern.
- Page 48, Overall schedule lacks specific dates and timelines. Seems very vague.
- Good job on Critical Risks and assumptions. Major hurdles for GreenHorn are 1) Administrations lack of desire to even discuss this issue 2) and changing habits of wasteful people that throw away recyclables even with recycle container present.
- Page 52, Good idea to employ student groups as volunteers. Great opportunity for large free source of labor.

Well that is my two cents. Hope it helps!

Hank Zawacki



Yahoo! Mail - stars2man@yahoo.com

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From:	Ed Sparks
To:	"Jack Mendell" <jmendell@tampabay.rr.com></jmendell@tampabay.rr.com>
Subject:	Polk County Solid Waste Division
Date:	Thu, 27 Apr 2006 09:17:19 -0400

Jack,

Based on our meeting last week I feel your on track. My only comment, as we discussed during the meeting, is to lease/rent as much equipment and personnel (using temps) to keep your capital and committed costs down during start-up.

I hope the little black book helped.

Edward Sparks Polk County Solid Waste Division 10 Environmental Loop Winter Haven, FL 33880 (863) 284-4319 Cell: (863) 559-2901



GreenHorn would like to thank the following people who provided input for this business plan.

- Dr. Sharon Hanna-West JD -Exide Distinguished Lecturer of Ethics and Sustainability and her class GEB 6930 - Societal Law & Issues In Sustainable Enterprises
- Edward Sparks Director Polk County Solid Waste Division
- Betty Henderson Recycling Specialist Polk County Solid Waste Division
- Albert A. Krause, Solid Waste Coordinator University of Florida
- Bill Giles Recycling Director Smurfit-Stone
- Dot Monroe Solid Waste Coordinator University of South Florida
- Lynn Robinson, P.E. Chair Tampa Bay Chapter Air & Waste Management Association (A&WMA)
- Ray Leblanc Temple Terrace Recycling Coordinator (received verbal agreement that they were very interested in involvement, written confirmation was not available at time of printing)
- Vicki W. Ahrens Executive Vice President of Operations MOSI (received verbal agreement that they were very interested in involvement, written confirmation was not available at time of printing)
- Dr. Gregory Henley
- Dr. Paul Givens



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