

Hot-tub Manufacturing Facility Waste Reduction Recommendation Report

*Prepared by Solana Recyclers, Inc.
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Summary

The Facility produces hot tubs and spas. The facility spans approximately 300,000 square feet and houses approximately 500 employees. The following locations were toured: shipping, receiving, grounds, cafeteria, manufacturing, administration, and employee restrooms.

Background Information

Address XXXXXXXXXXXXXXXXXX
XXXXXXXXXX

Contact XXXXXXXXXXXXXXXXXX

Phone XXXXXXXXXXXXXXXXXX

Waste Characterization Methodology

In order to obtain a representative waste sampling, waste collection containers were surveyed and analyzed from different locations throughout the facility. Individual waste materials were categorized and percentages were estimated based on the overall volume of each identified material in reference to the total waste volume.

Waste Characterization

Paper*	18%	corrugated cardboard mixed paper	10% 8%
Plastics	46%	PET/HDPE bottles (1,2) PVC (3) LDPE (4) (stretch wrap) Polystyrene Foam (6) Other (Quarite/ ABS plastic, Everwood, etc.)	2% 4% 5% 10% 25%
Glass	2%	other glass	2%
Metals	3%	scrap	3%
Other Organics	14%	wood waste Miscellaneous Organics	7% 7%
Other Waste	17%	All types-textiles, sponges, masking tape bundles, ABS	17%
Total	100%		100%

Waste Reduction Recommendations

I Recycle Clean Polystyrene Foam

The facility receives daily an average of 8 cubic yards of clean polystyrene foam from product shipped to the facility. If disposed of in the compactor, this material represents a significant trash volume. Service fees to pull the compactor amount to \$165/pull. This material would fill the equivalent of one compactor per week or \$165/week if not recycled. Storing the material in plastic bags for weekly pick-up alleviates a possible space issue for storage inside the warehouse. Recycling the polystyrene results in the following cost savings:

Compactor Service Fee Savings (One less pull/week, 52/yr)	\$8,580.00
Recycling Service Fees (\$160/month)	\$1,920.00
Annual Savings	\$6,660.00
Waste Diversion	3.9 tons/yr

Price Quote Received From:

Cactus Recycling	619/661-1283
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II Recycle Quarite and Clean ABS Plastics

Combined, the Quarite hard acrylic plastic and clean ABS plastic scrap represents approximately 5 cubic yards/day of material disposed in the facility waste compactor. This material represents a significant waste volume and contributes to the overall tonnage. It is estimated that one cubic yard of these materials weigh approximately 75 lbs. Accordingly, the daily material weight amounts to 375 pounds. Based on volume estimations above, recycling the plastic materials will reduce the trash volume by approximately 2.5 pulls/month--resulting in the following cost savings:

Compactor Service Fee Savings (2.5 pulls month -- \$412.50/month x 12 months)	\$4,950.00
Tonnage Savings (49 tons/year)	\$1,764.00
Service Fees (\$50/load - 52 pick-ups/year)	-\$2,600.00
Overall Cost Savings	\$4,114.00
Waste Diversion	49 tons/yr

Price Quotes Received From:

KAHO Plastics Nora Tho	760/591-7888
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II Install Warm Air Hand Driers in Bathrooms

There are approximately 12 male and female bathrooms located in all of Watkin s various facilities. The purchasing costs for multi-fold paper towels amounts to \$16,000 annually. It is suggested that Watkin s use air driers in all bathrooms. It is recommended that rubber mats be placed under air driers to reduce wetness on the floor. The cost break down for 24 air driers with automatic shut off sensors and associated costs are as follows:

Costs for Installing Air Driers:

Materials Costs (24 Driers @ \$280 each + tax)	\$7,240.80
Installation Costs (labor and electrical wiring)	\$2,880.00
Increased Utility Costs (added 10,000 kw hours yearly)	\$1,100.00
Maintenance Costs (est.)	\$500.00
 Total Initial Annual Expenditure	 \$11,720.00
 Current Paper Towel Purchasing Cost	 \$16,000.00

First Year Savings	\$4,280.00
Successive Year Savings	\$14,400.00

(utility & maintenance costs subtracted from
total spent amount spent yearly on paper towels = savings)

Waste Diversion **3.2 tons**

Cost estimates were received from the following:		
Warm Air Hand Driers	WAXIE Janitor Supply	619/292-8111
Installation	More Power Electric	619/566-1363
Utilities	SDG&E	800/411-7343

III Reuse Packing Paper from Electrical/Solar Department for Packing Materials in Accessories Department

Every day, approximately one cubic yard of uncompacted packing paper is generated in the electrical/solar department. This paper can be recycled in the cardboard recycling container. EDCO accepts this material as a *mixed paper* and needs to be notified if it will be included with the corrugated cardboard. However, the paper can be reused in the accessories department. Accessories spends an unspecified amount annually on packing paper for shipping parts and accessories. This money can be saved if packing paper is reused.

IV Improve Employee Education For Cardboard Recycling

Unflattened and flattened cardboard represents approximately 10% of the waste stream. To improve this figure and save money, it is recommended that all employees receive a brief training regarding which materials are recyclable and where they need to be staged in or outside the facility so that corrugated cardboard is not thrown into the compactor. If the facility achieves a 100% cardboard recycling rate, then Watkins will benefit from the following cost savings:

Two pulls less per month (40 yd. Compactor)	\$3,960.00/year
Waste Diversion	24 tons/year

Volume to Weight Conversion Estimate found in:
EPA Business Guide for Reducing Solid Waste, November 1993

V Use Reusable Coveralls for Employees

Based on a figure of ten employees using one disposable Tyvec suit per day, approximately 2,100 units are used annually with a purchasing cost of \$7,140. Reusable suits will save resources and money in the form of purchasing costs. Listed below is a cost analysis:

Option: 10 employees changing suits once per week-inventory of 3

Description	Quantity	Rate	Total
#252 C-3 Frock - White	30	\$0.65	\$19.50/week
Clean room Tote	3	n/c	0.00
Bar Code Fee (one time)	30	\$1.00	\$30.00
Total Annual Cost (for reusable rental/cleaning service)			\$1,044.00
Total Annual Cost for Disposable Smock			\$7,140.00
Annual Cost Savings			\$6,096.00
Waste Diversion			84 pounds

Cost estimates were received from:

ARAMARK Clean Room Services
Peter Frey 714/ 538-1445 or (fax) 714/538-5925

V Recycle All LDPE Plastic Film and Stretch Wrap

Watkins receiving department is the source of a small amount of LDPE stretch wrap from pallets. This material represents volume in the compactor and thus is a significant disposal cost. It is recommended that Watkins start recycling this material and use existing 55 gallon drums for this purpose in locations where the plastic is generated. KAHO will provide Gaylord boxes for storage of plastic and can haul materials weekly at no extra cost when other plastics are retrieved. Watkins will need to provide a forklift to load the Gaylords.

IX Miscellaneous Recommendations

- Purchase reusable cups/mugs for employees
- Post double-sided copying reminders above all copiers and train employees how to copy on both sides of the paper
- Put company bulletins on voice or electronic mail or post on a central bulletin board
- Reuse large envelopes and packing material like bubble wrap
- Donate foam packing peanuts to local postal franchises or the post office

Summary of Waste Reduction Recommendations

Description	Year 1 Savings	Successive Yr. Savings	Waste Diversion
Recycle Polystyrene	\$6,660.00	\$6,660.00	3.9 tons
Recycle Quarite/ ABS	\$4,114.00	\$4,114.00	49 tons
Install Air Driers	\$4,280.00	\$14,400.00	3.2 tons
Improve Cardboard Recycling	\$3,960.00	\$3,960.00	24 tons
Reusable Coveralls	\$6,096.00	\$6,096.00	n/a
Totals	\$25,110.00	\$35,230.00	80.1 tons

Please feel free to call Tyson Miller at Solana Recyclers with any questions concerning this report at 760/ 436-7986. Solana Recyclers, Inc. was able to perform this waste assessment service for The facility under the Sustainable Futures Project. This project is funded by region IX of the US EPA. The statements and conclusions of this report are those of the contractor and not necessarily those of the US EPA, its employees, or the federal government. The contractors make no warranty, express or implied, and assume no liability for the information contained in the preceding text. Reports are available for review by the US EPA grant manager. Otherwise, all information obtained in this assessment is confidential unless granted permission for public issuance.