

HUNTING FOR TRESURE:

STARTING A NON-FERROUS RECYCLING PROGRAM

WITH

ROLAND GIRARD

OF CANDIA'S RECYCLING CENTER

&

EDS HARDING

OF HARDING METALS INC.

NORTHWOOD, NH



Recyclers of Scrap & Precious Metals

HARDING

METALS, INC



- Established 1963
- Customers span from small walk-ins to the region's largest manufactures
- Process over 150 million pounds annually









- Non-Ferrous Scrap

- Copper
- Brass
- Aluminum
- Stainless
- Low Grade Copper Bearing





- Copper Classifications

#1 Bare Bright Copper Wire: 99.9% copper, greater than 16 inch gage, no pipe.

#1 Copper: Free of contamination. Pipe acceptable. No paint or solder.

#2 Copper: Paint and solder ends acceptable. Free of brass and steel fittings.

Light Copper: Used copper flashing, minimal tar and nails expectable.

Typically \$0.25 difference between grades





- **Insulated Copper Wire:**

House Wire/Romex/63% #1 Wire: Ratio of insulation to copper is 63%. #1 copper wire, free of plugs and boxes. No tin coated or alloyed copper.

Shop Wire/ 47% #2 wire: Appliance power cords, free of plugs and boxes. Tin coated and alloyed #2 wire acceptable.

Computer Wire/ >35% #2 wire: No Christmas lights, tv cable. Check for steel.

Many more classifications as well.

Be weary of Steel Coax.





- **Brass**

Yellow Brass: Faucets, 'figurines', drain pipes, cymbals, etc.

Free of steel contamination. No die cast handles.

Check for Die-cast imitations.

**As Tin is added to a Brass Melt, the value increases. Although, very tricky to spot to the novice eye.





- **Aluminum**

Old Aluminum: 5% contamination acceptable. Pressurized tanks, seal containers, fire extinguishers are prohibited.

Irony Aluminum: 50/50 Aluminum to contaminate ratio. All fluids must be drained.

Extrusion 6063: Extruded aluminum, mostly seen in window/door frames. Must be free of steel, felt and die cast corners. Paint acceptable. Thermalbreak unacceptable.

Extrusion 6063 1-2-% Cont.: Same as above with 1-2% contamination allowance of steel/felt. Die cast unacceptable. Thermalbreak unacceptable.

Aluminum Soda/Beer Cans

Over 50 grades of Aluminum





- **Stainless**

18/8 or 304 or 303: Must be completely free of contamination. Example, stainless sink must be cleaned of brass faucet, steel drain and *steel inserts*

Magnet Test: Will not stick, perhaps the slightest draw with hanging magnet.

Nickel gives stainless its higher scrap value. Once again, many different types while being difficult to spot to the novice eye.





- **Low Grade Copper Bearing**

Electric Motors: Copper wound with steel, aluminum or plastic case. Free from excessive plastic and steel attachment.

Low grade Electric Motors: Ceiling fans, standing fans, drills, garbage disposals etc.

Sealed Electric Motor Units: Also called compressors, “bowling balls” or just sealed units.

Transformers: different size, grade aluminum, copper or mixed.





- **New item!!**

Drained Air Conditioners

AC units that are drained, stacked and neatly wrapped on skid.

Ball park price \$0.20/lb, average \$200 per skid.



Northeast Resource
Recovery Association

School
Recycling CLUB



- **New item!!**

Drained Air Conditioners





- **Tips**

Packaging is key!

How will the material leave your facility?

How will the material be received at next facility?

- Feel free to contact for questions on grading



Northeast Resource
Recovery Association



- **Tips**

Magnets and Files are essentials for determining grades

Markets are always changing, Specs are always changing— be prepared

Don't over sort material

Don't Be Offended of Down Grades

Be Organized. Uses skids, drums, gaylord boxes, shrink wrap.

- Feel free to contact for questions on grading





- **Use the NRRA**

Harding Metals offers top tier pricing to NRRA—take advantage of this

NRRA coordinates with Harding Metals to pick up skids, not just whole truck loads

***Please have clean and neat skids😊**

There is low hanging fruit for the taking in you operation!



Northeast Resource
Recovery Association

School
Recycling CLUB



CANDIA'S METAL RECYCLING PROGRAM

2022 NRRA CONFERENCE

PRESENTED BY ROLAND GIRARD
VOLUNTEER AT CANDIA'S
RECYCLING CENTER



Northeast Resource
Recovery Association

School
Recycling CLUB



BACKGROUND INFO

- Candia is located 10 miles east of Manchester (off Exit 3 Rt. 101)
- Population approximately 4,000
- Number of households approximately 1,800
- Approximately 75% of households utilize the recycling facility
- The current facility was built in 2008
- 1,706 total tons refuse/waste processed through facility in 2021:
 - MSW and C & D; 1,311 tons
 - Paper, cardboard, glass, tin cans, aluminum cans, plastics, etc.: 314 tons
 - All metals: 112 tons



CANDIA'S RECYCLING FACILITY



Northeast Resource
Recovery Association

School
Recycling CLUB



Easily accessible bin for small metal items



The Main Metal Pile



METALS WE PROCESS

- Electrical wire----“shop” (light braided) and Romex
- Computer wire---“comm” wire
- Copper and brass----faucets, plumbing pipe, outdoor light fixtures, heating fins, radiators, etc.
- Elec. motors---“Clean” hi grade and “dirty” low grade
- Aluminum---“irony”, “old”, extrusion, cast, electrical wire, misc (rims, radiators)
- #1 HMS steel/cast iron---1/4 inch plus thickness---brake rotors & other car parts, old boilers, cast iron sinks/tubs, etc.
- St. Steel---Type 304/non-magnetic---sinks, pots/pans, parts of BBQ grills, etc



Containers for different grades of electrical wire—note aluminum radiators in back



Storage area for misc. copper and brass prior to processing



Specialized containers for “old” aluminum



Northeast Resource
Recovery Association

School
Recycling CLUB



Doors and window storage area



Primary holding area for #1 HMS steel/cast iron and misc. electrical motors



#1 HMS steel/cast iron awaiting pickup



Northeast Resource
Recovery Association

School
Recycling CLUB



METALS RECYCLED 2008-2021

<u>Category</u>	<u>Total tons</u>	<u>Total revenue</u>	<u>Avg \$/pound</u>
Light iron (the big pile)	1,651	\$221,894	\$.06/lb.
Non ferrous metals	110	\$123,200	\$.50/lb.

Results: 8 times better return/lb!!!



CANDIA'S METAL RECYCLING SYSTEM

- * Has evolved over the years
- * Key to the system---#1, Minimize handling!!
 - Make it convenient
 - Work area adjacent to the metal pile
 - Designated storage areas for each type metal
 - Regularly check main pile
 - Place right away in designated storage area!
 - Utilize specialized fixtures and good tools
 - Ask for advice and assistance
 - Minimize ALL efforts to process metals



A study done in 2022

- A GAYLORD FILLED WITH 1,361 POUNDS OF DIRTY BRASS—was it worthwhile cleaning it?



A GAYLORD FILLED WITH 1,361 POUNDS OF
DIRTY BRASS—WORTH \$136 IF LEFT ON LIGHT
IRON PILE (\$.10/LB)



Northeast Resource
Recovery Association

School
Recycling CLUB



- A GAYLORD FILLED WITH 1,361 POUNDS OF DIRTY BRASS—WORTH \$953 IF SOLD AS “DIRTY” BRASS (\$.70/LB)



A GAYLORD FILLED WITH 1,361 POUNDS OF DIRTY BRASS—WORTH \$2,614 IF CLEANED (RESULTING IN 968 LBS CLEAN BRASS) (\$2.70/LB) (40 hrs to clean--71% recovery rate)



Another example

- **Study in 2018 to determine the value of cleaning AC units**
- **Cleaned 142 AC units of various sizes**



Another example—Cleaning AC units

- **Total weight of the 142 AC units = 7,991 lbs.**
- **Value if left on light iron pile:
7,991 x \$.06/lb = \$598 or \$800
at \$.10/lb**



Another example—Cleaning AC units

- Total hrs.to clean: 71 Hrs.
- Resulting materials:

<u>COMPONENTS</u>	<u>TOTAL LBS.</u>	<u>% OF 7,991 LBS.</u>
– Sealed Compressor motors	2,985	37.4%
– Light iron (housing/frames)	2,300	28.8%
– Clean ACR coils (no steel, w/o ends)	863	10.8%
– Clean electric motors	758	9.5%
– #2 Copper (mostly ends)	136	1.7%
– #1 copper	70	.9%
– Shop wire	50	.7%
– Plastic & misc. trash	829	10.2%



Another example—Cleaning AC units

- Value after cleaning 142 units:

\$1,760 (2018 metal prices)

\$3,692 (Est. 2021 metal prices)

\$25/HR RETURN AT 2018 PRICES

\$52/HR RETURN AT 2021 PRICES



OUR RECOMMENDATIONS

- At a minimum---save all electrical shop wire
- Save all brass and copper
- Next steps?:
 - Sort and clean copper--#1 and #2 and dirty copper
 - Sort “easy to clean” brass—sell what's’ left as dirty brass
 - Start saving all aluminum---even it all goes as irony/dirty aluminum



WHERE TO GET ASSISTANCE

- **NRRA – call main line (800) 223-0150, talk to Marilyn, Bonnie, or Mike
(Or email info@nrra.net)**
- **Chuck Whichter, Candia Recycling Center Facility Manager —
(chuck.whitcher@hotmail.com)**
- **Roland Girard, Volunteer, Candia Recycling Center (Bevrol3@comcast.net)**
- **Eds Harding, Harding metals (EDS@HardingMetals.com)**



Trivia Questions

Time to win some prizes!



Northeast Resource
Recovery Association

School
Recycling CLUB



Trivia Questions

What are the 2 reasons Romex is worth more than shop?



Trivia Questions

Why is regular shop wire worth less than Romex?

Higher Copper ratio

&

Romex is graded as #1 and shop as #2



Trivia Questions

Comp is worth more than brass. What chemical element needs to exceed 5% to make comp grade?



Trivia Questions

Comp/Red Metal is worth more than brass. What chemical element needs to exceed 5% to make comp grade?

Tin (Sn) must exceed 5% of chemical make up.



Trivia Questions

Iron needs to be thicker than $\frac{1}{4}$ inch to be grade as #1. It must be smaller than what size to be graded as prep?



Trivia Questions

Iron needs to be thicker than $\frac{1}{4}$ inch to be grade as #1. It must be smaller than what size to be graded as prep?

It must be 5 ft by 3 ft.

If not it will be graded as #1 Unprepared.



Questions & Discussion



Northeast Resource
Recovery Association

School
Recycling CLUB

