Solid Waste Minimization
Difficult to Handle Materials

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- Indoor Air Quality & Mold Concerns
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- Safety Training & Audits
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- Among other EHS services

Goals & Challenges

1) Minimizing Hazardous Materials
2) Improving Circularity
3) Addressing Landfill Pressure
4) Evolving Trends

What makes something recyclable?

Material Composition

Collection and Logistics

Market Demand and Economic Viability

Chemical Intensity and Process

Four challenge areas for construction sustainability

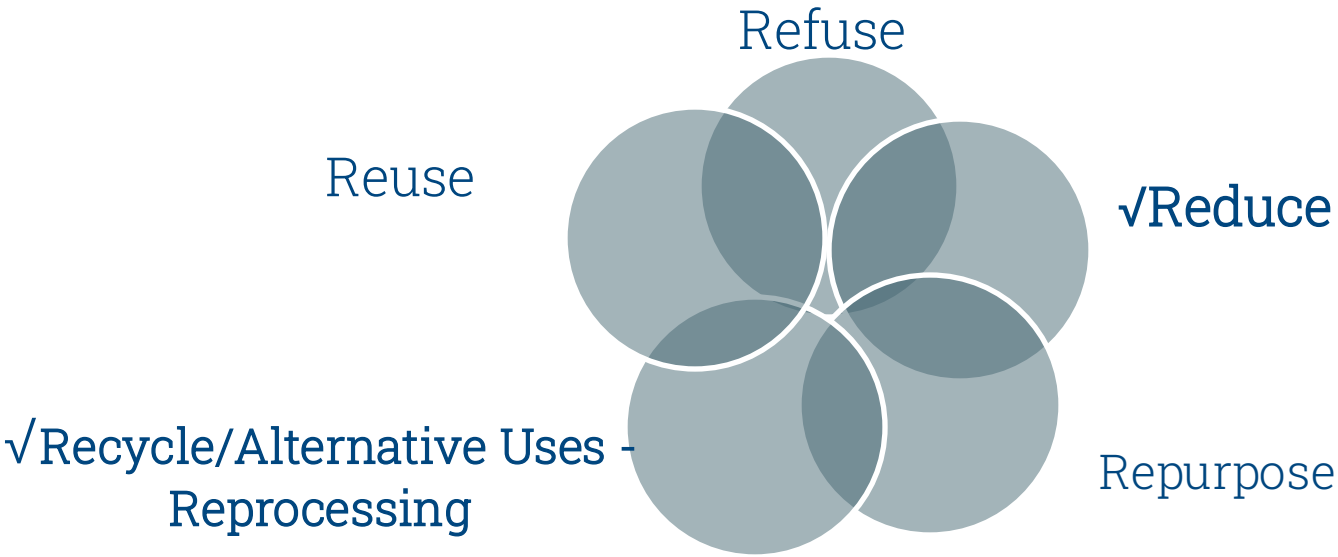
Hazardous Building Materials and impacts on sustainability

Keys for optimizing construction waste management for other difficult to handle materials

Planning for landfill constraint and LF avoidance goals/requirements

Evolving Trends

5 R's & What Can We Do with these types of materials?



Balancing Act

Quantity

Quality

Logistics

Markets

- Segregating, handling, pre-processing and logistics to final locations
- Alternative Use technologies can be very specific and have high quality specifications
- And … we just don't want some things to fall apart too easily …

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The Legacy – Hazardous Building Materials

When are they a problem?

- Confidence - be sure of the "negative" and control for "overestimating the positive"
- Project sequencing can be like "peeling an onion" be ready to update findings as demolition & deconstruction proceeds

The Legacy – Hazardous Building Materials

- Regulatory applicability
- Cost – Benefit of remedial and disposal resources
- Perception, Operations & Maintenance
- Get the characterization right and the wastes to a minimum

Asbestos – Minimization Opportunities

- Limited – “no safe limit” & adds volume (and embedded energy) through secondary materials (poly)
- Options and regulatory structure exist to manage “in place” but not commonly considered in renovation work – no cut off dates
- Improve inspection/assessment to improve certainty that material streams contain asbestos, rather than using “presumptions”

2000 square feet of poly at 60 pounds

Cost before “carbon”	Cost after “carbon”
$130	>$260*

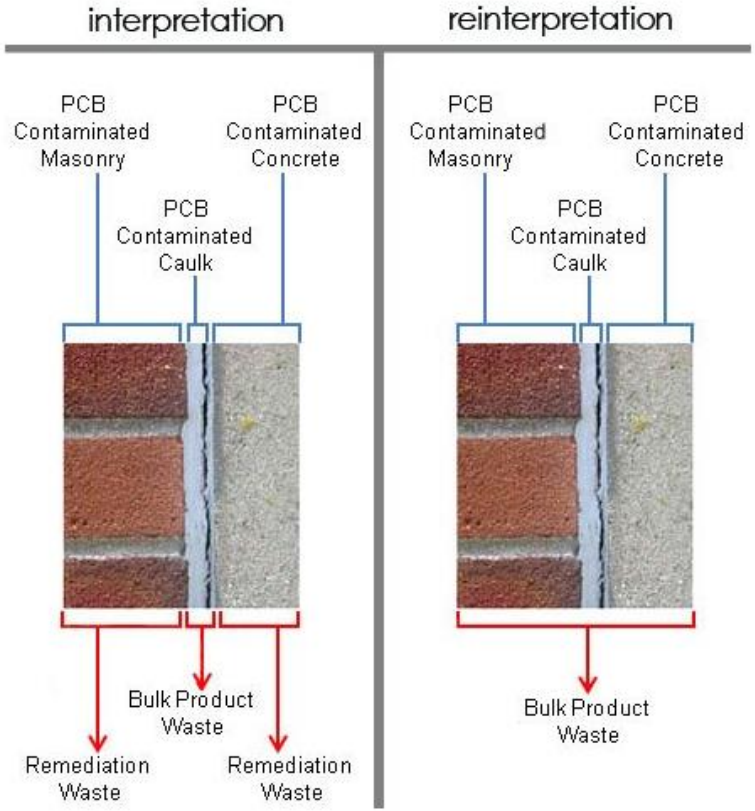
*Various sources estimates

Lead – Minimization Opportunities

- Limited – better than Asbestos/PCBs
- General demolition and Lead Based Paint (LBP) components
- Consequence – still lead
- Selective deconstruction – doesn't have to be lead abatement; allowances for worker protection and process control – minimize the regulated stream
- Advantages – potential to recover / reuse architectural/dimensional materials
- Improvement – chemical coating removal

PCBs – Minimization Opportunities

- Limited – what level of confidence?
- Thin line between waste differentiators (PCB Bulk Product vs PCB Remediation)
- Reinterpretation – improved handling and greater efficacy in project flows.
- Often commingled with other HBM (asbestos/lead)



Mercury

- Blessedly less common in paints and coatings
- Mostly found in switches, lighting systems
- Purpose specific

PFAS?

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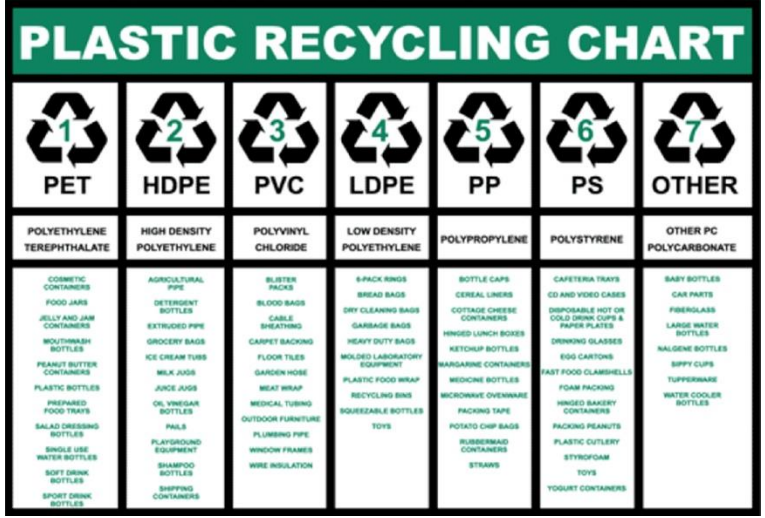
THE BULLETIN BOARD

Saint-Gobain completes demolition of Merrimack facility embroiled in PFAS pollution scandal

BY: **WILLIAM SKIPWORTH** - JULY 3, 2025 1:02 PM

- Evolving regulatory structure
- Potential for dramatic impacts on material stream identification/characterization/disposal



Improving Circularity for "Harder to Recycle" Material Streams

- What are "hard to recycle" materials? Carpets, mixed streams of foams, films, cardboard, wood scrap – often in same containers
- Various estimates on total tons recycled vs wasted; smaller projects can have higher waste rates
- Have a plan – what materials, how much, avoid accumulation – Disney goal is 90% diversion in construction projects

“National Sword”

Understand end market/user specifications for contamination/material stream conformance – there are quality standards – these bales were formerly “recycled” … somewhere else, but can be co-processed for cement

What level of “pre-processing” or on-site management is needed?

What do we do with this stuff?

Other Options

- On-site shredding and compaction

- Adopt a “supplier” mindset – quality in the product

Prevention Through Design & Sustainability

Wastage rates can be reduced using this methodology & improve safety

ASSP ANSI Z590.3 – Prevention Through Design Standard
CDC NIOSH – Prevention through Design

Landfills


ENERGY + ENVIRONMENT

New surcharge on solid waste in New Hampshire to take effect in January

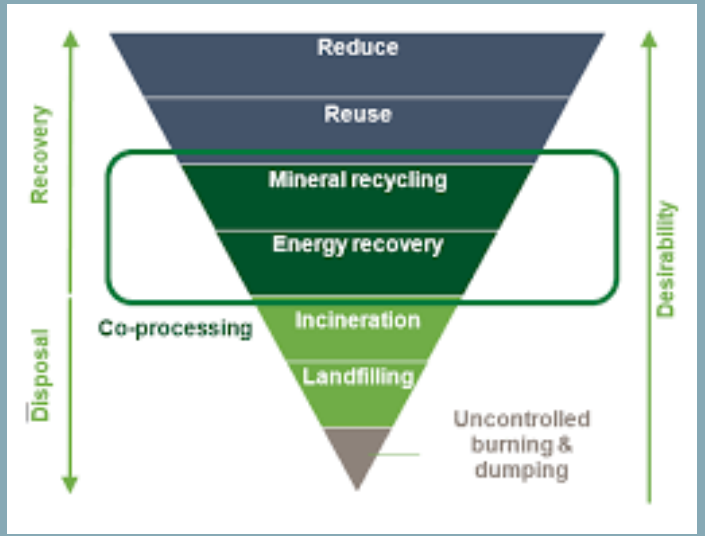
BY: WILLIAM SKIPWORTH - AUGUST 13, 2025 5:00 AM

- NH – is a “net importer”
- Seasonal and growing residential/MSW increase pressure
- Landfilling “cheapest” endpoint most of the time – though this can change
- Landfill Bans – NH just developing

Other Options

- Economic, technology and logistical constraints
- Florida Recycles – Recovered Materials Rule
- Cement Co-Processing avoids both fossil fuel use and native materials extraction
- Energy Values - Engineered Municipal Solid Waste Fuel Streams – USEPA NHSM
- Reverse logistics driven by sustainability goals
- Higher costs for disposal = opportunity

CONSIDER PARTNERSHIPS WITH CO-PROCESSORS



Action Plan

1) Control contamination (dirt, batteries, organics, mixed materials, difficult to process materials)
2) Provide for site logistics and material stream integrity – organized area, clear markings
3) Track generation
4) Train teams to maintain integrity and quality control
5) Look for aggregators and reverse logistics opportunities – have enough to make it worthwhile

Conclusion

1. Technologies and markets– new opportunities
2. Keep looking at waste minimization & “management in place” strategies for certain material classes – can we enclose, contain or encapsulate
3. Learn about aggregators and markets outside the Northeast
4. Evaluate streams of materials that may have higher market values, including foams, films and strapping.
5. Keep working with local partners for solutions
6. Plan for solid waste handling in new construction – how will it be handled?

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