

# **RRFB Nova Scotia Glass Study**

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# Objectives

- review the current glass recycling methods in place in Nova Scotia;
- investigate new and emerging markets, both local and out of province for post-consumer glass; and
- investigate the equipment and associated costs required to process glass.

# Post-consumer Glass Estimate for Nova Scotia

<b>Source</b>	<b>Amount (tonnes)</b>
Enviro-Depots (refundable glass)	11,000 to 12,000
Local MFRs and other WSF	1,000 to 3,000

- does not include potential waste ICI glass (windshield glass, windows, etc...)

# Post-Consumer Glass in NS

- Sorted at Enviro-Depots according to colour (clear or mixed)
- Shipped to one of four regional transfer facilities
- Glass is sent to Neighbourhood Recycling processing plant in Scoudouc, NB
- Coloured glass is processed for sale to Owens Illinois in Scoudouc, NB (scheduled to close April 30, 2008)
- Clear glass is shipped to Montreal, QC

# Requirements

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- Transportation is the greatest cost – solution must be local
- Processors generally want clean glass without contaminants

# Potential Applications for Nova Scotia

- roadbed aggregate;
- daily landfill cover and landfill construction;
- wastewater filtration in septic beds;
- sandblast material;
- winter sand/salt mix for roads
- gardens, landscaping and walking trails;  
and
- container manufacturing.

# Applications That Do Not Have Potential in Nova Scotia

- water filtration;
- specialty asphalt;
- reflective beads for road paint; and
- fiberglass insulation.

# Roadbed Aggregate

- post-consumer glass - crushed and screened
- granular base material for road and parking lot construction
- fine aggregate size fraction exhibits properties similar to that of a fine aggregate or sandy material
- Many states, countries, municipalities and private contractors have already approved cullet for use as construction aggregate and are conducting field trials

# Daily Landfill Cover and Landfill Construction

- daily cover for landfill
- sub-base material for roads through out a landfill.

# Low Cost Option

- Application:
  - Roadbed aggregate
  - Daily Landfill Cover and Landfill Construction
- Specifications:
  - Cullet with some contaminant removal
- Equipment:
  - Glass crusher, conveyors for manual sort, screens

# Wastewater Filtration in Septic Beds

- research indicates that crushed glass performs as well as sand filters in the treatment of sewage effluent
- regulations regarding on-site sewage disposal systems would need to be modified to include the use of glass sand

# Low to Medium Cost Option

- Application:
  - Wastewater filtration in septic beds
- Specifications:
  - Glass sand with some contaminant removal
- Equipment:
  - Glass pulverizer, conveyors for manual sort, screens

# Sandblast Material

- compressed air at high pressure to blow abrasive material, such as sand, glass beads, metal pellets, etc. through a spray nozzle
- uniform size is required - must meet specifications of mesh size
- Shaw Resources ran a trial to use glass sandblasting media for use in the autobody industry

# Medium to High Cost Option

- Application:
  - Sandblasting material
- Specifications:
  - Cullet/glass sand with high level of contaminant removal
- Equipment:
  - Glass crusher/pulverizer, conveyors for manual sort, screens, magnet, eddy current separator

# Winter Sand/Salt Mix for Roads

- Sand added to road salt to improve traction
- Sand used in winter instead of salt
- Primary concern is potential damage of tires from glass material

# Gardens, Landscaping and Walking Trails

- Crushed mixed colour glass - attractive ground cover or garden mulch
- Requires renewal of the glass layer
- Issue with public safety perceptions

# Medium to High Cost Option

- Application:
  - Winter sand / salt mix for roads
  - Walking trails
- Specifications:
  - Glass sand with high level of contaminant removal
- Equipment:
  - Glass pulverizer, conveyors for manual sort, screens, magnet, eddy current separator, dust control

# Container Manufacturing

- Silica sand, soda ash, and limestone are primary ingredients for production of glass containers.
- Cullet must be free of contaminants that do not melt during processing - ceramics and metals
- Contaminants damage glass melting furnace and lower the quality of glass containers
- Colour sorting very important

# High Cost Option

- Application:
  - Container manufacturing
- Specifications:
  - Cullet with high level of contaminant removal
- Equipment:
  - Glass crusher, conveyors for manual sort, screens, magnet, eddy current separator. Specialized colour separation equipment and specialized ceramic/metal removal may be required due to stringent specifications.

# Water Filtration

- Similar application to wastewater filtration
- Utilize sand filters to remove bacteria, suspended solids and other contaminants
- Modern trend in water treatment industry - membrane filtration rather than filter media
- Any media that would be used for potable water supply requires stringent certification process

# Specialty Asphalt

- Asphalt with glass cullet: “glassphalt”
- Similar to conventional hot-mix asphalt
- Percentage of rock and/or sand aggregate replaced by crushed glass.
- Most common applications:
  - surface pavement for residential streets;
  - secondary roads;
  - parking lots;
  - sidewalks; and
  - curbing.
- Skid resistance of glassphalt slightly lower than conventional asphalt.
- NSTPW conducted a study of using glass in asphalt in the mid 1990’s.
- Result: glass tends to strip from the asphalt.

# Reflective Beads for Road Paint

- Glass beads in road paint reflect light and increase visibility
- Works best during darkness, rain, and fog.
- Only clear glass can be used
- NSTPW specifications for glass beads requires large capital investment in processing equipment
- Involves high equipment maintenance costs.

# Fiberglass Insulation

- Fibreglass manufacture can utilize post-consumer glass
- No major fibreglass insulation producers in Nova Scotia

# Conclusions

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- High capital costs and maintenance costs
- Negative public perception