

# Treatment of Waste by Anaerobic Digestion

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Manufacturer's Zero Waste Conference

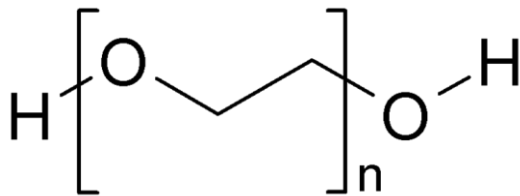
# Introduction to Grifols



- Pharmaceutical Manufacturing in Clayton, NC
- ~1600 employees, 240 acres
- Manufacture products from human plasma
- Participant in NCDENR's Environmental Stewardship Initiative (Rising Steward level)
- ISO 14001 Equivalent Program

# Significant Waste Streams

- Spent Polyethylene Glycol (PEG)
  - Mostly water
  - Contains PEG, salts and proteins
  - Does not break down in wastewater treatment

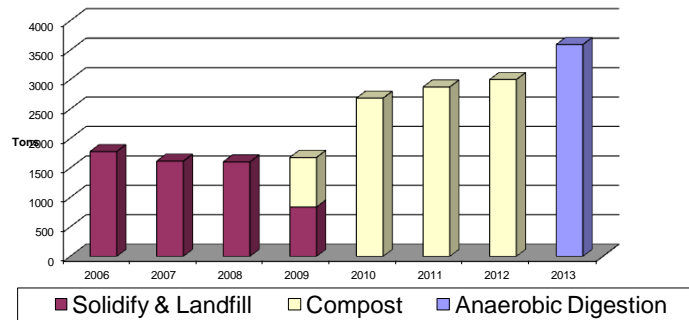


- Paste and Filters from plasma fractionation
  - Derived from human plasma
  - Contains proteins, filter aid, filter papers

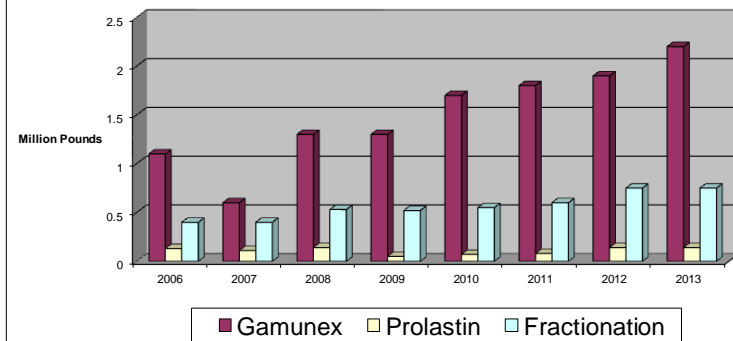


# Volume Increases

## PEG Waste

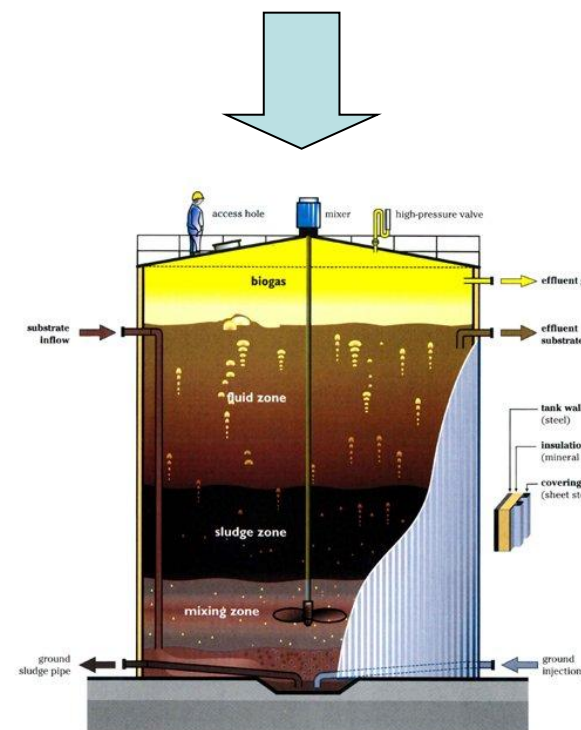


## Paste and Filters Waste



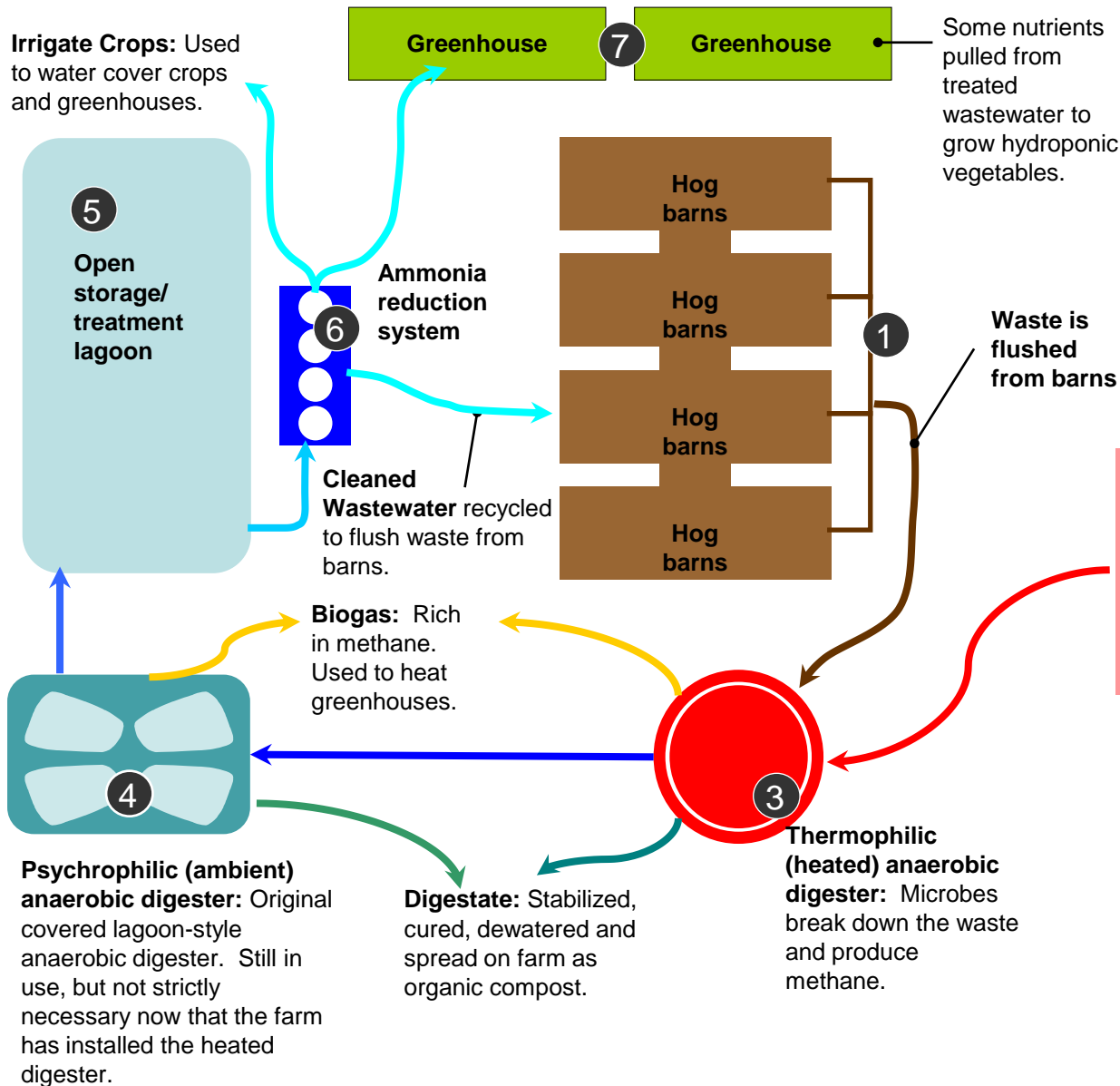
# Disposal Methods for PEG Waste

- Pre-2009
  - Shipped to facility about 2.5 hours away
  - Solidified and Landfilled
- Mid-2009 to 2012
  - Shipped to a facility about 1.5 hours away
  - Composted
  - Reduced cost
  - Composter had difficulty with high water content
- Beginning 2013
  - Shipped to a facility 9 miles away (20 minutes)
  - Anaerobically Digested



# Full Circle Recycling, Zebulon, NC

A complicated but efficient way to treat hog waste (and Grifols waste):



## Treatment of Grifols' Spent PEG

# Paste and Filters Waste

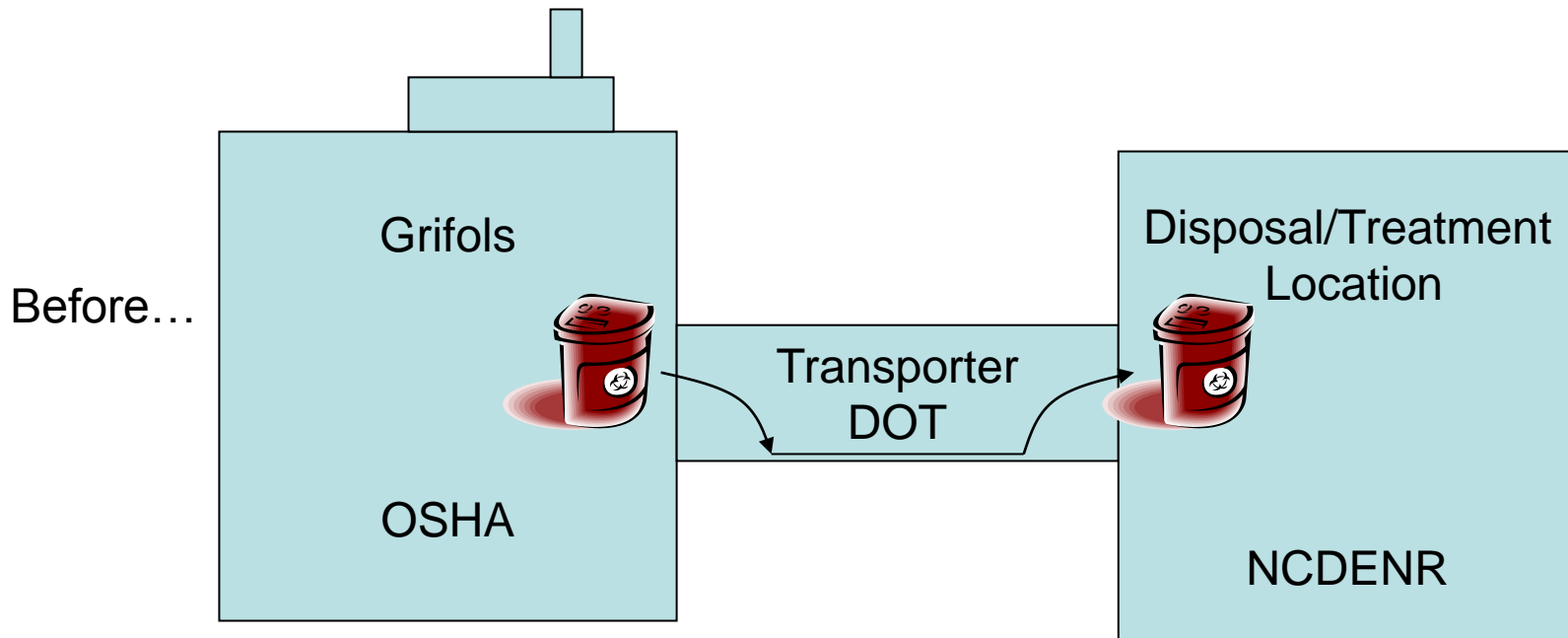
- **Regulated Medical Waste (Body Fluids)**
- Derived from Human Plasma
- Treatment – incineration at medical waste incinerators
  - Too dense to autoclave or chemically treat
- Significant shipping distances
- Labor intensive

## Options

- Landfill
- Incineration
- Anaerobic Digestion



# Relationship of Agencies concerning Regulated Medical Waste (simplified)



After... Grifols **treats** medical waste. OSHA still applies.

DOT **exempts** Grifols waste.

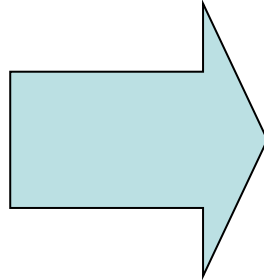
NCDENR **allows** alternative final treatment/disposal.



## Result –

- 95% decrease medical waste stream disposal.

- Increased recycling opportunities!



### WASTE SEGREGATION GUIDE

 <b>RECYCLE</b> NON-BIOHAZARDOUS Rebate - \$0.06/lb	<b>PLASTIC</b>  CLEAR FILM / PACKAGING	<b>PLASTIC</b>  BOTTLES AND JUGS	<b>PLASTIC</b>  RED BAG ROLLS	<b>PLASTIC</b>  SPECIMEN CUPS	<b>PLASTIC</b>  PITCHERS AND SCOOPS	<b>PLASTIC</b>  SHRINK WRAP HANDLES
 <b>RECYCLE</b> NON-BIOHAZARDOUS Rebate - Unknown	<b>GARMENTS</b>  NITRILE GLOVES	<b>GARMENTS</b>  COVERALLS	<b>GARMENTS</b>  FACE MASKS	<b>GARMENTS</b>  HAIR NETS / BEARD COVERS	<b>GARMENTS</b>  BOOT COVERS	<b>WRITING UTENSILS</b>  PENS / MARKERS
 <b>RECYCLE</b> NON-BIOHAZARDOUS Rebate - \$0.026/lb Transportation - \$0.024/lb	<b>PAPER</b>  WHITE OFFICE PAPER	<b>PAPER</b>  PAPERBOARD PACKAGING	<b>PAPER</b>  CARDBOARD CORES	<b>PAPER</b>  TAGS AND LABELS	<b>PAPER</b>  BROWN PAPER	<b>METAL</b>  STAINLESS STEEL
 <b>TRASH</b> NON-BIOHAZARDOUS Disposal cost - -0.027/lb	<b>CLEANING</b>  WIPES	<b>CLEANING</b>  MOP HEADS	<b>CLEANING</b>  BRUSHES / SPONGES	<b>PPE</b>  FACE SHIELDS	<b>PPE</b>  LATEX GLOVES	<b>PPE</b>  RUBBER / VINYL GLOVES
 <b>TRASH</b> NON-BIOHAZARDOUS Disposal cost - -0.027/lb	<b>PPE</b>  GREY GLOVES	<b>PROCESSING</b>  TUBING	<b>PACKAGING</b>  BOX STRAPS / ZIP TIES	<b>PACKAGING</b>  SHRINK WRAP ROLLS	<b>MISCELLANEOUS</b>  LABEL CARTRIDGE	<b>MISCELLANEOUS</b>  PROCESSING PARTS
 <b>MEDICAL WASTE</b> BIOHAZARDOUS Disposal cost - -0.09/lb - \$0.30/lb (Varies) Rebate for plastic bottles - \$0.00/lb - \$0.10/lb (Varies)	<b>PROCESSING</b>  YIELD BOX LINERS	<b>PROCESSING</b>  FILTERS	<b>PROCESSING</b>  PASTE	<b>PROCESSING</b>  PLASMA BOTTLES	<b>SHARPS</b>  NEEDLES / SYRINGES	<b>MISCELLANEOUS</b>  DISCARDED PRODUCT

**MANUFACTURING AND LABORATORIES**

FOR A MORE DETAILED REFERENCE GUIDE AND ACCESS TO CONTAINER LABELING TEMPLATES PLEASE GO TO THE PORTAL.

As of 3/24/14

**GRIFOLS**

**Any questions, call or e-mail.**

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