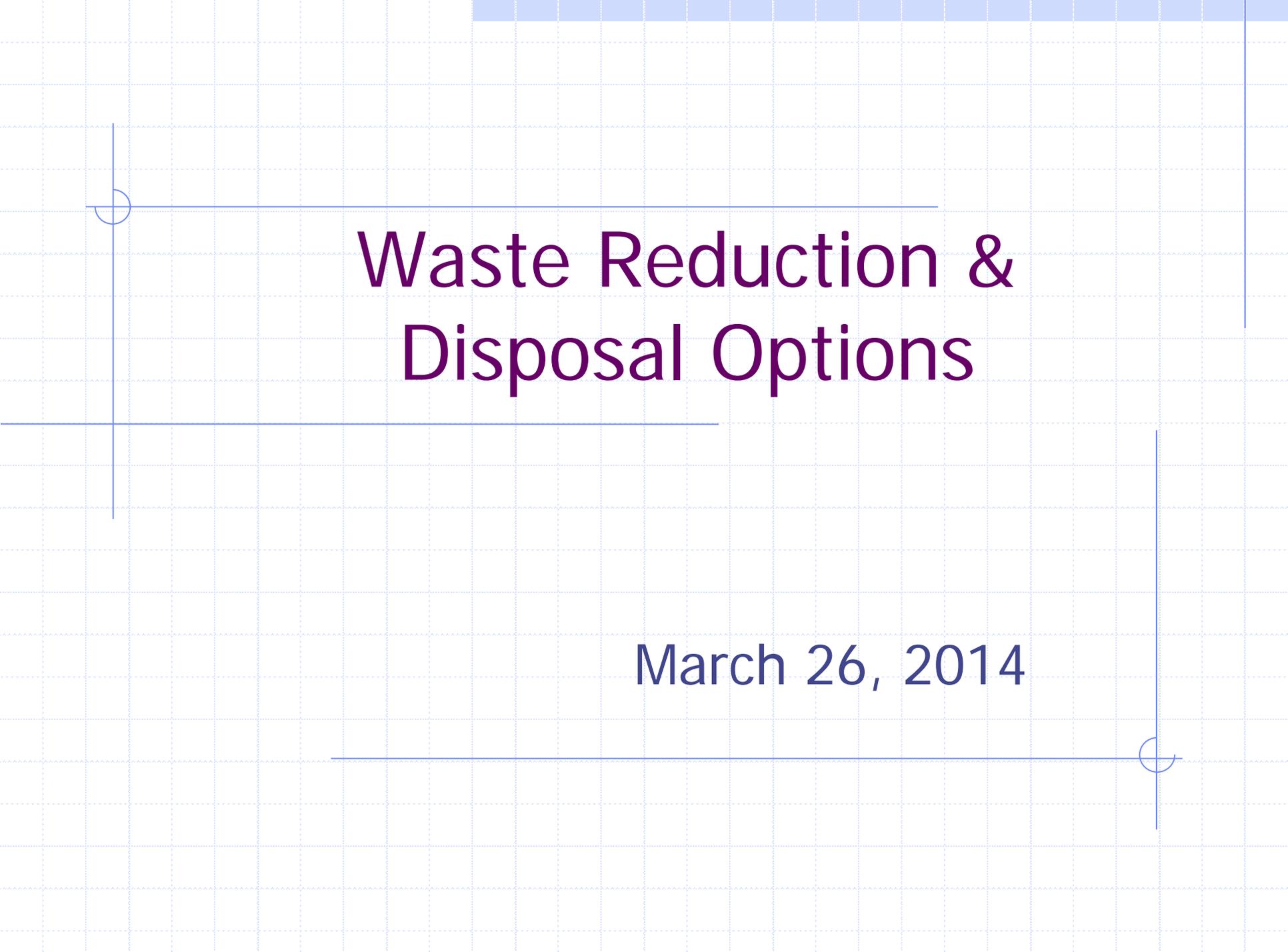


# North Dakota Department of Health



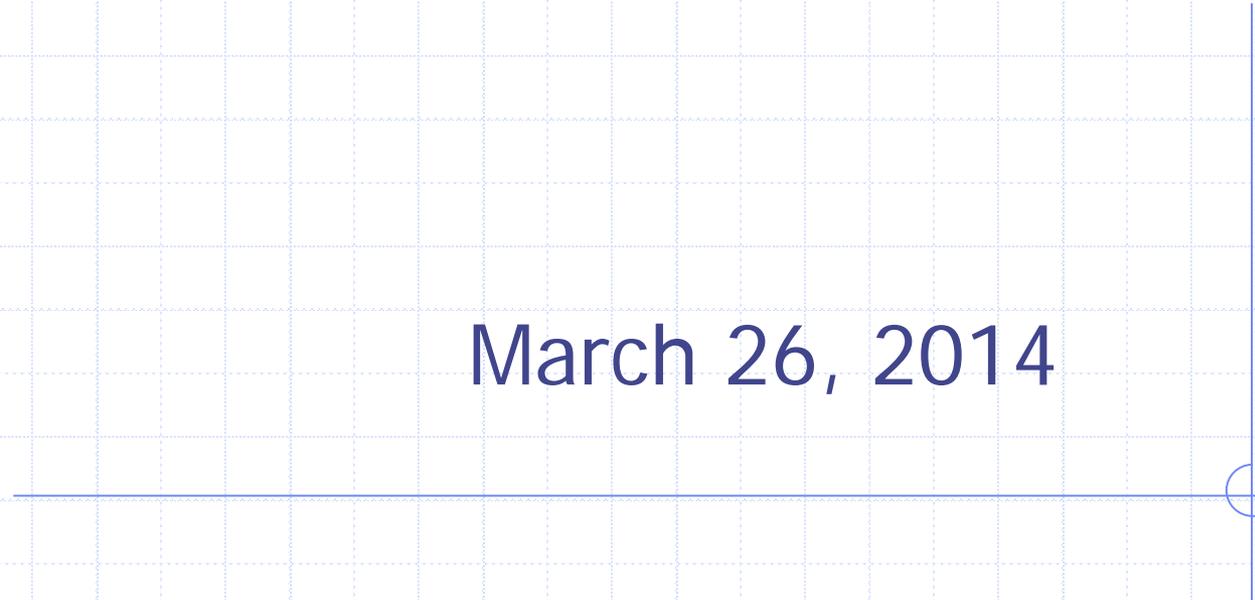
**Promoting a Healthier Tomorrow**





# Waste Reduction & Disposal Options

March 26, 2014



# Integrated Waste Management

What is the Hierarchy?

- Reduce
- Reuse
- Recycle and Compost
- Recover Energy
- Incineration and/or disposal

# Landfills in North Dakota

## 4 Types of Landfills in ND:

- Inert Waste Landfills
- Municipal Solid Waste Landfills (MSW)
- Special Waste Landfills
  - Oilfield Special Waste Landfills
  - Special waste landfills for energy conversion facilities (ex. Power plants)
- Industrial Waste Landfills

# Landfills in North Dakota

- Inert Waste Landfills – 211 in ND
  - Permit By Rule (PBR) landfills for towns of less than 1,000 people – 138 in ND
    - Accepts only take construction & demolition waste
    - Most only take grass & leaves for composting and clean wood for burning
  - Permitted Inert Landfills – 73 in ND
    - Accepts only take construction & demolition waste
      - Metal, wood, bricks, masonry & cement concrete, asphalt concrete, tires, tree branches, etc.
      - Appliances & other metal wastes should be stockpiled for recycling
      - Concrete & asphalt can also be stockpiled for crushing & reuse

# Landfills in North Dakota

- Municipal Solid Waste Landfills (MSW) – 13 in ND
  - Accepts waste generated from households, motels, hotels and recreation facilities; by public and private facilities; and by commercial, wholesale, and private and retail businesses.
  - May NOT accept:
    - Hazardous waste (except household quantities)
    - Industrial waste (unless approved by the Dept.)
    - Lead-acid batteries
    - Liquids (except household quantities)
    - Scrap metal & appliances must be recycled
    - Municipal waste incinerator ash
    - Pesticide containers (unless they are empty & triple rinsed or rinsed & punctured)
    - PCB wastes
    - Sludges, grit chamber cleaners & manure (unless approved by the Dept.)
    - Regulated infectious waste
    - Special wastes
    - Used oil

# Landfills in North Dakota

- Special Waste Landfills – 21 in ND
  - Accepts solid waste that is not hazardous waste and includes waste generated from energy conversion facilities; waste from crude oil and natural gas exploration and production; waste from mineral and ore mining, beneficiation, and extraction; and waste generated by surface coal mining operations.
  - Oilfield Special Waste Landfills – 9 in ND
  - Energy Conversion Special Waste Landfills – 12 in ND
    - Associated with the power plants and coal mines

# Landfills in North Dakota

- Industrial Waste Landfills – 4 in ND
  - Accepts solid waste, which is not hazardous waste, generated from the combustion or gasification of municipal waste and from industrial and manufacturing processes.
  - Small Volume Industrial Waste Landfills – 3 in ND
  - Large Volume Industrial Waste Landfills – 1 in ND

# Where can you take your waste?

- More information can be found at:
  - [www.ndhealth.gov/wm/Publications/](http://www.ndhealth.gov/wm/Publications/)
- Lists for:
  - Concrete/Asphalt Recycling Facilities  
<http://www.ndhealth.gov/wm/Publications/ConcreteAsphaltRecyclingFacilities.pdf>
  - Asbestos Disposal  
<http://www.ndhealth.gov/wm/Publications/ApprovedLandfillFacilitiesThatWillAcceptFriableAsbestosContainingMaterialForDisposal.pdf>

# Where can you take your waste?

- Lists for:
  - Scrap Metal & Auto Recyclers  
<http://www.ndhealth.gov/wm/Publications/ScrapMetalAndAutoRecyclersList.pdf>
  - Wood Processing Recycling Facilities & Equipment Vendors  
<http://www.ndhealth.gov/wm/Publications/WoodProcessingRecyclingFacilitiesAndEquipmentVendors.pdf>
  - And much more at: [www.ndhealth.gov/wm/Publications/](http://www.ndhealth.gov/wm/Publications/)
- Also contact the Solid Waste Program:
  - (701) 328-5166

**Trees & Brush - What do we do with this stuff?**  
**- Large volume material**



# Grand Forks Storm Wood Piles – 9/11/01













WELCOME TO  
RISMARCK

Wood Chips as Landscaping Mulch

# Wood as landscape mulch





Weed/Moisture Control Problems



Wood Mulch:  
N.D. Dept of Transportation

# Advantages of Mulch – NDDOT



- Conserve moisture
- Keeps soil cooler
- Reduce erosion
- Control weeds
- Reduce maintenance
- Attractive
- More economical
- Dutch Elm Control



Wood Mulch Use in Communities



# Wood Mulch in Playgrounds

# Wood Mulch in Playgrounds



- Safer than sand, rock, or pavement
- Less mess
- Kids stay clean
- Less cost than other materials
- Lighter to transport
- Parents and kids prefer it!



Wood Mulch in the Yard

# Wood Mulch in the Yard



- Safe and clean
- Controls moisture and weeds
- Lighter to apply
- Will not get thrown by yard equipment
- Safe for kids
- Less likely to stumble on material

# Wood Chip Berm

## **Sediment Filter – CA & WA**

- Wood chip filter berms placed at the edge of construction area as a temporary sediment filter.
- On sites where wood chips are readily available from clearing activities, a wood chip filter in small areas on gentle slopes.
- Sediment laden runoff is filtered or detained and allowed to settle out.
- Efficient on small sites with gentle slopes.

# Wood Chip Berm

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- Slope – 5% or less, uphill slope distance of 33 meters or less.
- Berm should be placed on contour.
- Simple installation by windrowing chipped material and lightly compacting with loader or excavator bucket.

# Wood Chip Berm

- The berm shall be maintained at a minimum of 0.67m in height for the duration of use.
- Can also be used as visual or mud tracking barrier.
- Areas of bare soil should be mulched or otherwise protected.
- More information can be found at:
  - <http://tti.tamu.edu/documents/0-4572-1.pdf>
  - <http://www.wsdot.wa.gov/biz/construction/RoadwayTeam>

# WOOD OPPORTUNITIES



# **Yard Waste – Very High Volume**

**- Up to 50% in peak months**

**Compost Windrows at Bismarck  
Landfill**



# Yard Waste Compost Uses

- Valuable soil amendment
- Promotes grass growth in the toughest areas
- Successful uses in DOT projects in Texas, Iowa, Minnesota, and other states
- Available from many larger cities
- For more information:
  - [www.compostingcouncil.org/](http://www.compostingcouncil.org/)
  - [www.dot.state.tx.us](http://www.dot.state.tx.us)

# Texas DOT Compost Test Site – 1999

Slopes had been blanketed, hydro-mulched  
and seeded many times



# Compost application with seed



**40 mph winds**

**Wood chips added for weight**

**Picture from across the interstate – July 15, 1999  
- two months after application –  
Treated Area Left --- Untreated Area Right**





**July 1999 - with 2" rain in late May,  
Good grass covers slopes!**

# Compost Works For:

- Soil Incorporant
  - Turf establishment
  - Garden bed preparation
  - Reclamation/remediation
  - Nursery production
  - Roadside vegetation

# Compost Works For:

- Surface Applied
  - Garden bed mulch
  - Erosion control media
- Turf topdressing
- Manufactured topsoil
- Growing media component
  - Container/potting substrates
  - Landscape (e.g. rooftop, raised planters)
  - Backfill mixes (tree and shrub plantings)
  - Golf course (e.g. tee, green, divot mixes)

# Compost Works For:

- Physical improvement
  - Improves soil structure
  - Moisture management
  - Moisture infiltration
- Chemical balance
  - Modifies and stabilizes pH
  - Increases cation exchange capacity

# Compost Works For:

- Biological impact:
  - Supplies nutrients and soil biota
  - Suppresses plant diseases
- Other benefits:
  - Binds/degrades contaminants
  - Binds nutrients

# Why do we use compost?

- Weed free source of organic matter.
- Allows faster plant growth and rooting.
- Great moisture holding capabilities.
- Rich in nutrients.
- Great disease suppression qualities.
- Can fix poor soils, physically and biologically.

# Plants Grow Better with Compost



# Compost and Mulch Blowers



# Minnesota Erosion Control/Runoff Problem Area

By Chuck Joswiak Windscapes Express Blower & Filtrex Midwest



**Compost for erosion control. Half-and-half blend of compost and wood chips sprayed on slopes to control erosion, while also amending the soil with nutrients.**

**Grass seed can be applied at the same time.**







# Iowa State Study - Compost

- Compost treated areas showed significant weed suppression.
- Compost areas subjected to high intensity rainfall took significantly longer to produce runoff.
- Provided less inter rill runoff than traditional methods.
- Surface application worked as well or better than tilling.

# When to consider compost:

- Poor quality soils that will not support vigorous rapid growth.
- Projects completed too late in the season.
- Locations that are too steep or hard to reach with heavy equipment.
- Areas where weed control cannot be used.
- High profile areas where immediate results are needed.



# COMPOST LOGS!

– Erosion Control, Bio-Filter, etc.

By Chuck Joswiak - Filtrexx Midwest

# Compost Logs

- Can be used to replace silt fence, straw bales, and straw waddles.
- Provide three way filtration.
- Less disposal cost than silt fence.
- Can be live staked or seeded at installation.



# Erosion Control Logs & Filter Berms

## TXDOT

- Mesh tubes filled with compost and wood chips form a stable “log” that prevents runoff at construction sites.
- When building concludes, each tube is slit and the contents are left to nourish the soil.

# Erosion Control Logs & Filter Berms

- Filter berms made from compost or mulch are an alternative to silt fences and hay bales.
- The mounds are dense enough to hold their shape, yet porous enough to allow water (but not debris) to move through and into storm drains.



Compost Treatment (back)  
vs. No Treatment (Front)

Note compost filter logs





# General Use Compost

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- This all-compost product is used mostly as a soil amendment or surface cover for revegetation, or for enriching landscape planting beds.
- It can also be applied on established turf as top dressing in place of fertilizer applications.

# Compost-manufactured topsoil

- Compost that is premixed or incorporated on site as one-quarter of the soil creates a highly enriched topsoil for establishing vegetation.



10. 4. 2001



9.18.2001

# Important things to consider:

- The compost has been tested and is a finished product.
- The installer is certified.
- The products used are certified.
- You may need to use other “tools” in conjunction with the compost.



Typically 0.5 m high by about 1 m wide

**Compost filter berm replaces a failed silt fence, shown in the background** (Goldstein, 2001).  
Typically 0.5 m high by about 1 m wide

# N.S.W. - Erosion Test Results on 43% Slope

<http://www.recycledorganics.com/infosheets/Stormwater%20Report%20final%20po.pdf>

TEST PLOT	Settleable Solids mL/L	T Susp Solids mL/L
Control (untreat)	34.0	31,000.0
Silt Fence	32.0	26,000.0
Hydro Mulch	3.0	740.0
Med. Compost-	0.8	280.0
Coarse Compost	1.4	690.0
Compost Barrier	2.6	1,300.0
Leaf Compost	2.8	740.0

# Compost and Compost Blends

- Typically up to a 2:1 slope at an application rate of 8 to 10 cm.
- Compost layer absorbs rainfall energy.
- Compost layer absorbs substantial volume of water.
- Reduces the flow velocity and improves percolation rates.

# Compost and Compost Blends

- Berms made from a mix of fine and coarse (woody fraction) compost particles with 10 to 20% stone, bark, sand and/or gravel (Alexander, 1999)
- Generally applied using a bulldozer, grading blade or pneumatic blower

# Compost and Compost Blends

- Prior to the use of blowers, efficient application of compost was hard to achieve.
- The blower application method has positioned compost berms as highly efficient and effective erosion control measures.
- For more information:
  - <http://www.recycledorganics.com/infosheets/Stormwater%20Report%20final%20po.pdf>

# Plants Grow Better with Compost



Courtesy of Boulder Park, Inc.

# Wood Chips & Compost Sources

- City of Bismarck Landfill
  - Galen Bren (701) 391-1484  
[gbren@nd.gov](mailto:gbren@nd.gov)
- City of Fargo Landfill
  - Paul Hanson (701) 476-5955  
[phanson@cityoffargo.com](mailto:phanson@cityoffargo.com)
- City of Grand Forks Landfill
  - LeahRae Amundson (701) 738-8740  
[lamundson@grandforksgov.com](mailto:lamundson@grandforksgov.com)

# Wood Chips & Compost Sources

- City of Dickinson Landfill
  - Aaron Praus (701) 456-7776  
[aaron.praus@dickinsongov.com](mailto:aaron.praus@dickinsongov.com)
- City of Minot Landfill
  - John Reynolds (701) 857-4719
- City of Jamestown
  - Roger Mayhew (701) 252-5223  
[rmayhew@daktel.com](mailto:rmayhew@daktel.com)

# Sustainable Construction

- Reduce resource consumption
- Reuse resources
- Use recyclable resources
- Protect nature
- Eliminate toxics
- Apply life cycle costing (economics)
- Focus on quality

# Where do we go from here?



## Contact:

Solid Waste Program  
ND Dept. of Health  
918 E. Divide Ave., 3<sup>rd</sup>  
Floor  
Bismarck, ND 58501  
(701) 328-5166



# Sustainability

## Building a sustainable society:

- “One that is able to satisfy its needs without diminishing the chance of future generations.” (1981 – Lester Brown)
- “Meeting the needs of the present without compromising the ability of future generations to meet their needs.” (1987 – Bruntland Commission)