Trends in Solid Waste Management
North Carolina

SWANA NORTH CAROLINA CHAPTER
Annual Spring Technical Conference
May 1, 2007
Waste Disposal in North Carolina

Fact versus Perception

Division of Waste Management
NC DENR
‘52 Refuse Disposal by Sanitary Landfill by the NC Div of Sanitary Engineering / State Board of Health
’67 SW Mgmt Survey
- Federally funded 3 positions
- 479 disposal sites
- 23 were deemed “protective”

’69 Solid Waste Disposal Act
- State Board of Health assist Local Govt
- Insect & Rodent Control Section > Solid Waste and Vector Control Section
- 9 State funded positions
’71 Rules and Regulations Providing Standards for Solid Waste Disposal

- 456 dumps > 160 landfills
- Language changed from just disposal to “Reduction” “Reuse” “Recycling

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Wake up calls…
’80s medical waste on beaches

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’87 NYC trash barge
- Belief that capacity in NC does not exist

- Late ’80s - draft of Subtitle D language

- NC policy to protect groundwater outside of landfills
‘89 Solid Waste Management Act

Established:
- goals & policies
- new programs
- landfill bans
- reporting requirements
- planning requirements

1987 garbage barge from New York City

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• ’91 EPA Revisions to Subtitle D of RCRA
• ’98 Adoption of present 1600 rules
Municipal Solid Waste Landfills in North Carolina 1990 and 2005

1990

2005

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Municipal Solid Waste Flow FY 1990-1991
MSW waste disposal

- 6 Facilities Dispose 51% of MSW:
  - 12,357 tpd

- 14 Facilities Dispose 10% of waste:
  - 2,170 tpd

- 20 Facilities Dispose 40% of waste:
  - 9,784 tpd

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NC DENR
MSW Facilities
Average Tons per Day

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NC DENR
# Disposal rates

<table>
<thead>
<tr>
<th>Fiscal Years</th>
<th>Tons Disposed</th>
<th>Population</th>
<th>Per Capita Disposal</th>
<th>Inc%/Dec-%</th>
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</thead>
<tbody>
<tr>
<td>2005-2006</td>
<td>11,753,004</td>
<td>8,663,914</td>
<td>1.36</td>
<td>27%</td>
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<tr>
<td>2004-2005</td>
<td>11,029,485</td>
<td>8,541,263</td>
<td>1.29</td>
<td>21%</td>
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<tr>
<td>2003-2004</td>
<td>10,713,444</td>
<td>8,418,090</td>
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<tr>
<td>2002-2003</td>
<td>10,236,960</td>
<td>8,323,375</td>
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<td>15%</td>
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<td>2001-2002</td>
<td>9,999,284</td>
<td>8,188,008</td>
<td>1.22</td>
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<td>2000-2001</td>
<td>9,752,510</td>
<td>8,049,313</td>
<td>1.21</td>
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<tr>
<td>1999-2000</td>
<td>10,267,137</td>
<td>7,938,062</td>
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<td>1998-1999</td>
<td>9,214,323</td>
<td>7,797,501</td>
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<td>1997-1998</td>
<td>8,607,578</td>
<td>7,645,512</td>
<td>1.13</td>
<td>5%</td>
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<td>1996-1997</td>
<td>8,741,727</td>
<td>7,490,812</td>
<td>1.17</td>
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<td>1995-1996</td>
<td>7,722,795</td>
<td>7,336,228</td>
<td>1.05</td>
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<td>1994-1995</td>
<td>7,624,144</td>
<td>7,180,525</td>
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<td>1993-1994</td>
<td>7,038,505</td>
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<td>1992-1993</td>
<td>6,890,818</td>
<td>6,892,673</td>
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<td>1991-1992</td>
<td>(managed) 7,257,428</td>
<td>6,781,321</td>
<td>(Base Year Rate) 1.07</td>
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<td>1990-1991</td>
<td>7,161,455</td>
<td>6,632,448</td>
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Division of Waste Management

NC DENR

<table>
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<tr>
<th>Fiscal Year</th>
<th>Total Msw</th>
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<tr>
<td>FY 2000-2001</td>
<td>6,748,017</td>
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<td>FY 2001-2002</td>
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<td>FY 2004-2005</td>
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<td>FY 2005-2006</td>
<td>7,961,264</td>
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</table>

Increase of 18% since 2000
Remaining Total MSWLF Capacity in Tons
As of FY 2005-2006
C&D landfills

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NC DENR

FY 2000-2001: 1,627,600
FY 2001-2002: 1,906,084
FY 2002-2003: 1,844,409
FY 2003-2004: 2,020,529
FY 2004-2005: 2,436,442
FY 2005-2006: 2,707,592

Increase of 66% since 2000

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TRANSFER STATIONS

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Transfer Station Growth in North Carolina from 1990-2005

Created - 1-08-07
Data - North Carolina Division of Solid Waste Database
Map by - Garrett Davis and Environmental Finance Center - UNC Chapel Hill
Funding by - NCDENR

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Active Transfer Stations

SUB "D" EFFECTIVE 10/9/93
MANDATED DEADLINE 1/1/98

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Transfer Stations

Annual Tons Received at Facilities

Year


Division of Waste Management NC DENR
## Compliance

<table>
<thead>
<tr>
<th>Facility Type</th>
<th># Facilities</th>
<th>Inspections</th>
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<tr>
<td>Municipal Solid Waste landfills (MSWLF)</td>
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<td>2</td>
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<td>Construction and Demolition landfills (CDLF)</td>
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<td>Industrial landfills (INDUS)</td>
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<td>Treatment and Processing facilities (TP)</td>
<td>28</td>
<td>2</td>
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<tr>
<td>Mixed Waste Processors (MWP)</td>
<td>19</td>
<td>2</td>
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<td>Household Hazardous Waste facilities (HHW)</td>
<td>15</td>
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<td>Incinerators (INCIN)</td>
<td>8</td>
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<td>Tire Monofill landfills (TIRELF)</td>
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<td>Tire collection /processing facilities (TIRETP)</td>
<td>11</td>
<td>1</td>
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<td>Medical Waste facilities</td>
<td>5</td>
<td>2</td>
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<td>Composting facilities (COMP)</td>
<td>52</td>
<td>1</td>
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<td>Transfer facilities (TRANS)</td>
<td>104</td>
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<td>Land Clearing and Inert Debris Landfills (LCID)</td>
<td>152</td>
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<td>Land Clearing and Inert Debris Notified sites</td>
<td>731</td>
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<tr>
<td>Pre-Regulatory Demolition landfills (DEMO)</td>
<td>158</td>
<td>0</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>1587</strong></td>
<td><strong>1171</strong></td>
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</table>

Division of Waste Management NC DENR
North Carolina Solid Waste Disposal 20-Year Forecast
Straight line Population and Straight line Disposal

Population / Tons Disposed

ACTUAL

FORECAST

TONS DISPOSED

P O P U L A T I O N

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Solid Waste in North Carolina

The future:

More of the same

(Probably continue to have more and more waste)

Yet very different

(Probably become one of the nation’s leading importers of waste)

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Fact vs Perception

- Who will take financial responsibility for closed landfills?
- How can host government protect and improve local community when landfills are built?
- Should landfills go in areas of flooding, wetlands, sensitive flora/fauna?
- What effects do landfill gases, leachate have on surroundings?
- Will landfill increase traffic to a dangerous degree?
- Will transportation of waste on barges & rail cause new contamination?
- Is hazardous waste disposed of in NC landfills?
- Does building large landfills make Recycle/Reduce/Reuse less attractive?

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AN ACT TO impose a moratorium on the consideration of Permit applications and issuance of permits for the construction of new landfills in the state and to direct the environmental review commission to study issues related to solid waste disposal in order to protect Public health and the environment.
SECTION 4.  Study. – The Environmental Review Commission, with the assistance of the Division of Waste Management of the Department of Environment and Natural Resources, shall study issues related to solid waste. The Commission shall specifically study measures concerning:

(1) Financial responsibility requirements for solid waste landfills, including the application of requirements to limited liability companies and other business entity structures of applicants seeking solid waste landfill permits.

(2) Application of franchise requirements and local government approval for solid waste landfill permits, including adequacy of public notice and comment, community studies, and site designations prior to local government approval.

(3) Siting, design, and operational requirements for landfills for the disposal of construction or demolition waste, municipal solid waste, or industrial solid waste that are proposed in areas susceptible to flooding from natural disasters, areas with high water tables, and other environmentally sensitive areas.

(4) Formation of dangerous chemicals and gases in flood-prone landfill environments.

(5) Traffic considerations for proposed landfills.

(6) Regulatory oversight and staffing for permitting and compliance of solid waste landfills, and inspection of waste containers on barges, railways, and trucks.

(7) Compliance with statutory prohibitions on disposal of certain types of solid waste and measures to prevent disposal of hazardous waste in solid waste and construction and demolition landfills.

(8) Ways to reduce the amount of solid waste disposed of within North Carolina landfills, including statewide tipping fees, bans on the disposal of certain types of waste in landfills, more aggressive recycling requirements, and enhanced regulatory requirements for landfills and other solid waste management facilities.
Solid Waste Landfill Study

Actual Imports / Exports

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Imports</th>
<th>Exports</th>
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<tbody>
<tr>
<td>FY 1997-1998</td>
<td>87,393</td>
<td>629,415</td>
</tr>
<tr>
<td>FY 1998-1999</td>
<td>74,185</td>
<td>1,166,875</td>
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<tr>
<td>FY 1999-2000</td>
<td>41,840</td>
<td>1,106,897</td>
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<tr>
<td>FY 2000-2001</td>
<td>21,614</td>
<td>900,743</td>
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<tr>
<td>FY 2001-2002</td>
<td>117,981</td>
<td>882,247</td>
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<tr>
<td>FY 2002-2003</td>
<td>144,116</td>
<td>971,286</td>
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<tr>
<td>FY 2003-2004</td>
<td>108,803</td>
<td>1,048,111</td>
</tr>
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<td>FY 2004-2005</td>
<td>119,202</td>
<td>1,161,926</td>
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<tr>
<td>FY 2005-2006</td>
<td>137,307</td>
<td>1,234,307</td>
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Division of Waste Management
NC DENR
Solid Waste Landfill Study

Forecast Imports / Exports

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Average Gate Fees Per Ton

- $20.01 - $30.00
- $30.01 - $40.00
- $40.01 - $50.00
- $50.01 - $60.00

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Solid Waste Landfill Study

Solid Waste Disposal Fee Per Ton
- No fee
- Fee

- Tennessee $1.00
- Kentucky $1.75
- West Virginia $8.75
- Ohio $1.75
- Pennsylvania $6.25
- Rhode Island $1.00
- Connecticut $1.00

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Solid Waste Landfill Study

States with Solid Waste Disposal Fee

Map Color Legend
$1 or less -
Greater than $1 and less than $3 -
Greater than $3 and less than $5 -
Greater than $5 -
State tax on waste generators -
No Fee
Solid Waste Landfill Study

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Where is Alabama? No liners are required here and it is only 80 miles from NC, while many of the NE states are 600+ miles away.

Virginia does not require plastic liners; soil can be used if it meets the permeability requirements.

West Virginia does not require plastic liners; soil can be used if it meets the permeability requirements.

Georgia has granted variances to the landfill liner requirement to almost all C&D facilities in the state.

Tennessee has soil liner requirements but does not require leachate collection.
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West Virginia requires a Subtitle D Composite or approved alternative. Applicant may model gw at relevant point of compliance to use an alternative liner or no liner.

Tennessee has soil liner requirements but does not require leachate collection.

True, Tenn regs require 5 feet of 1 x 10^-5 clay and do not require leachate collection.

Georgia has granted variances to the landfill liner requirement to almost all C&D facilities in the state.

Because of Hurricane Katrina we chose not to look at this state.

Georgia’s regs requires liner designs that can be modeled to ensure compliance of groundwater standards at relevant point of compliance.

Virginia requires one of:
1) 1 foot compacted 1 x 10^-7 cm/sec clay.
2) Synthetic liner on prepared subgrade
3) In place soil equivalent to (1) above
4) Double liner with leak detection (and no monitoring wells)

West Virginia requires a Subtitle D Composite or approved alternative. Applicant may model gw at relevant point of compliance to use an alternative liner or no liner.

Virginia requires one of:
1) 1 foot compacted 1 x 10^-7 cm/sec clay.
2) Synthetic liner on prepared subgrade
3) In place soil equivalent to (1) above
4) Double liner with leak detection (and no monitoring wells)
Municipal Solid Waste Landfill Buffers and Separations

Bedrock

Bottom of Liner

Edge of Waste

Wells

Residences

Streams

Property Boundary

Seasonal High Water Table

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Solid Waste Landfill Study

Environmental Study
- Required
- Not required
Solid Waste Landfill Study

Traffic Study
- Yes
- No

Division of Waste Management
NC DENR
<table>
<thead>
<tr>
<th>State</th>
<th>Aluminum Cans</th>
<th>Anti-freeze</th>
<th>CESQG</th>
<th>LCID</th>
<th>Lead Acid Batteries</th>
<th>Oyster Shells</th>
<th>Pesticide Containers</th>
<th>Rigid Plastic Containers*</th>
<th>Sewage Sludge</th>
<th>Tires</th>
<th>Untreated Regulated Medical Waste</th>
<th>Used Oil*</th>
<th>White Goods</th>
<th>Wood Pallets*</th>
<th>Yard Trash</th>
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* Bans take effect 2009 in NC.
For More Information...

- Ellen Lorscheider  
  Division of Waste Management  
  Solid Waste Section  
  1646 Mail Service Center  
  Raleigh, NC 27699-1646  
  Phone 919.508.8499  
  email- ellen.lorscheider@ncmail.net  
  http://wastenotnc.org