

**City of Northampton  
Solid Waste Management Alternatives Study**

**Public Presentation  
JFK Community Room  
August 17, 2009 – 7:00 pm**

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**One Team. Infinite Solutions**



**Stantec**

**HDR**

# Overview of Presentation

- Schedule of events
- Speaker introductions
- Presentation
- Public questions
- Public comments

# Purpose and Objectives of Study

- Landfill will be out of capacity by 2011
- Decision needs to be made on expanding landfill or implementing alternative disposal arrangements
- Study reviewed technical, financial and non-monetary factors for five solid waste management options including:
  - Current collection system and expanding the landfill
  - Current collection system and closing the landfill
  - Citywide curbside collection and expanding the landfill
  - Citywide curbside collection and closing the landfill
  - Providing no service and closing the landfill
- Results of study will be used as part of the decision making process

# Current System

- Regional Landfill
- Drop-off Centers
- Vehicle Permits and Bag Stickers
- Subscription Service
- Recycling and Composting
- Enterprise Fund

# Waste Generation and Composition

Table 2-1

## Municipal Waste Programs Using the Northampton Landfill

Municipality	Direct Haul, Tons	Recycling Rate	MOU	PAYT	Comments
Amherst	349	16%	X	X	Individual MOU
Ashfield	417	48%	X	X	HRMC
Chesterfield	181	51%	X	X	HRMC
Cummington	249	41%	X		HRMC
Gill	214	44%	X	X	FCSWMD
Goshen	169	53%	X	X	HRMC
Granville	242	40%	X	X	Individual MOU
Hadley	430	n/a*	X	X	Individual MOU
Hatfield	315	n/a*	X	X	Individual MOU
Huntington	491	45%	X	X	HRMC
Middlefield	149	39%	X		HRMC
Plainfield	116	58%	X	X	HRMC
Southampton	825	64%	X	X	Individual MOU
Westhampton	345	46%	X	X	HRMC
Williamsburg	577	38%	X		HRMC
Worthington	272	53%	X	X	HRMC
<b>Subtotal</b>	<b>5,399</b>				16 municipalities
Northampton	3,925	34%	N/A	X	RSW & Bulky Waste From 2 Drop-off Facilities
<b>Total</b>	<b>9,324</b>				

Notes:

MOU – Memorandum of Understanding

PAYT – Pay as You Throw

HRMC – Hilltown Resource Management Cooperative

FCSWMD – Franklin County Solid Waste Management District

RSW – Residential Solid Waste

# Waste Generation and Composition

Table 2-2

## Municipal Waste Disposal Tonnage

City of Northampton	Tons Disposed
Locust Street Department of Public Works Drop-Off	1,909
Northampton Landfill Drop-Off	1,322
Public Schools and Parking Division	384
Exempt <sup>(1)</sup>	194
Wastewater Treatment Plant Residuals (Grit)	116
<b>Total</b>	<b>3,925</b>
<b>Percent of CY 2008 Waste Disposed</b>	<b>7.9%</b>

Regional Towns	Tons Disposed
Hilltown Resource Management Cooperative (HRMC) <sup>(2)</sup>	2,965
Southampton	825
Hadley	430
Amherst	349
Hatfield	315
Granville	242
Gill	214
Easthampton (Wastewater Treatment Plant Grit Only)	59
<b>Total</b>	<b>5,399</b>
<b>Percent of CY 2008 Waste Disposed</b>	<b>10.9%</b>

Notes:

(1) Includes: All City Departments, Northampton Housing Authority, Child's Park, Look Park, and Authorized Community Cleanups.

(2) HRMC includes the towns of: Ashfield, Chesterfield, Cummington, Goshen, Huntington, Middlefield, Plainfield, Westhampton, Williamsburg and Worthington.

# Waste Generation and Composition

Table 2-3

## Major Waste Hauler Tonnage

Major Haulers	Tons Disposed
Duseau Trucking	11,436
Waste Management	8,671
Alternative Recycling Systems	5,613
Allied Waste Systems	4,531
Wickles Trucking	52
Total	30,303
Percent of CY 2008 Waste Disposed	61.3%

# Waste Generation and Composition

Table 2-4

## Small Haulers, Major Business and Institutional Customer Tonnage

Hauling/Cleanout Services	Tons Disposed
B'n'B	1,443
Allen's Roll-off	1,210
One Call Does It All	686
QuadCom Carting	278
Baldwin's	166
Martin's Farm	138
Sticks & Stones	130
Short Haul	66
Dan's Odd Jobs	51
Northstar Disposal	41
<b>Total</b>	<b>4,211</b>
<b>Percent of CY 2008 Waste Disposed</b>	<b>8.5%</b>

Institutional Customers	Tons Disposed
Smith College	836
University of Massachusetts	358
Veteran's Administration (VA) Hospital	266
Deerfield Academy	201
Eaglebrook School	74
Clarke Scholl for the Deaf	24
Hampshire County Jail	15
<b>Total</b>	<b>1,775</b>
<b>Percent of CY 2008 Waste Disposed</b>	<b>3.6%</b>

Major Business Customers	Tons Disposed
Young Roofing	184
Roberts Roofing	142
Valley Home Improvement	142
RCI Roofing	125
<b>Total</b>	<b>594</b>
<b>Percent of CY 2008 Waste Disposed</b>	<b>1.2%</b>

All Other Commercial Customers (336 Permits)	Tons Disposed
<b>Total</b>	<b>3,198</b>
<b>Percent of CY 2008 Waste Disposed</b>	<b>6.5%</b>



# Waste Generation and Composition

Table 2-5

Private Hauler Route Locations

Haul Route Location	Duseau Trucking	Alternative Recycling	Waste Management	Allied Waste Services
Amherst	X	X	X	
Ashfield		X	X	
Bernardston	X		X	
Buckland	X	X	X	
Charlemont		X	X	
Chester			X	
Chesterfield		X	X	
Colrain			X	
Conway			X	
Cummington		X	X	
Deerfield	X	X	X	
Easthampton	X	X	X	X
Erving			X	
Gill		X	X	
Goshen		X	X	
Greenfield	X	X	X	
Hadley	X	X	X	X
Hatfield	X	X	X	X
Holyoke		X		
Huntington			X	
Leverett		X	X	
Miller's Falls			X	
Montague	X	X	X	
Northampton	X	X	X	X
Northfield			X	
Pelham			X	
Plainfield		X		
Shelburne	X	X	X	
Shutesbury	X			
South Hadley		X		
Southampton		X		
Sunderland		X	X	
Turner's Falls		X	X	
West Springfield		X		
Westhampton	X	X	X	X
Whately	X	X	X	
Williamsburg		X	X	X
Worthington		X		
<b>Total Cities and Towns - 38</b>				

# Waste Generation and Composition

TABLE 2-6  
EASTERN HAMPSHIRE REGIONAL REFUSE DISTRICT  
WASTE STREAM COMPOSITION

Component	Residential Wastestream Percentage		Commercial Wastestream Percentage		Weighted Average Wastestream Percentage	
	Sub-Cat.	Category	Sub-Cat.	Category	Sub-Cat.	Category
PAPER		41.0%		33.8%		37.2%
Newspaper	8.4%		7.4%		7.9%	
Corrugated	7.0%		7.0%		7.0%	
Office	2.7%		1.7%		2.2%	
Mixed	5.4%		3.4%		4.3%	
Other	17.5%		14.3%		15.8%	
PLASTICS		5.8%		7.6%		6.8%
HDPE Containers	0.9%		0.6%		0.7%	
PET Containers	0.4%		0.3%		0.3%	
Other	4.5%		6.7%		5.7%	
GLASS		7.5%		2.9%		5.1%
Glass Containers	7.3%		2.6%		4.8%	
Other	0.2%		0.3%		0.3%	
METAL		3.2%		4.0%		3.6%
Bi-metal Containers	2.3%		0.8%		1.5%	
Aluminum Containers	0.4%		0.6%		0.5%	
Other Ferrous	0.4%		2.3%		1.4%	
Other Non-Ferrous	0.1%		0.3%		0.2%	
FOOD		17.0%		27.0%		22.3%
LEAF & YARD		13.3%		2.2%		7.4%
OTHER ORGANICS		4.7%		9.5%		7.2%
TIRES		0.1%		0.1%		0.1%
WHITE GOODS		0.1%		0.3%		0.2%
BATTERIES		0.3%		0.2%		0.2%
HAZARDS		0.5%		0.1%		0.3%
OTHER INORGANICS		6.5%		12.3%		9.6%
TOTAL		100.0%		100.0%		100.0%

Source:

Data from Eastern Hampshire Regional Refuse District Comprehensive Solid Waste Management Plan, Executive Summary dated May 1995.

# Waste Generation and Composition

- Waste Generation Within Northampton (2008):
  - Total MSW for Disposal = 14,800 tons
  - Total Drop-Off Center for Disposal = 3,925 tons
- Waste Generation Sources (Eastern Hampshire Study):
  - Residential = 45%
  - Commercial = 50%
  - Construction & Demolition = 5%
- Organics Content
  - Organics = 74%
  - Non-organics = 26%

# Zero Waste Planning – Materials Diversion

# Pieces of Zero Waste Programs



- Comprehensive recycling programs
  - Multi-material
  - Convenient
  - Available to all generators
- Organics diversion
  - Yard trimmings
  - Food scraps
  - Compostable paper
- C&D diversion
  - Generator-based
  - Hauler-based
  - Facility-based
- Zero Waste Policies
  - “New rules”
  - Disposal bans
  - Mandatory recycling
  - Product stewardship
  - Comprehensive outreach and technical assistance
- Zero Waste Infrastructure
  - Neighborhood scale
  - Reuse and recycling
  - Materials recovery
  - C&D processing
  - Organics processing
- Residual Waste Management
  - Alternative technologies
  - Residual waste transfer
  - Residual waste disposal

# Pieces of Zero in Northampton



- Comprehensive recycling/diversion programs
  - Mandatory Recycling/PAYT
  - Public Area Recycling
  - Other targeted materials
    - ❑ Electronics, books, textiles
    - ❑ Mass Recycles Paper
    - ❑ Sharps and Unwanted Meds
  - HHW
  - Organics diversion
    - ❑ Back yard Composting
    - ❑ Leaf and Yard trimmings
  - Other Events and Programs
    - ❑ Green Action
    - ❑ HHW
    - ❑ Mass Recycles Paper
    - ❑ Sharps and Unwanted Meds
- Zero Waste Policies
  - Disposal bans implemented
  - Mandatory recycling
  - PAYT
  - Technical Assistance and Support for Businesses and Institutions
  - Educational Outreach
- Zero Waste Infrastructure
  - Drop off Centers
  - Springfield MRF
  - Landfill
  - Regional Material Recovery Centers
  - Local Charitable Organizations
  - Local Reuse Businesses
- Residual Waste Management
  - Residual waste disposal

# Zero Waste in Northampton Targets

- Upstream
  - Support regional and state EPR efforts
- Downstream
  - Examination of Innovative, Emerging and Other Conversion Technologies for processing post-consumer post recycled waste
  - Examination of Expanding Options for Diverting the Organic Fraction

# Innovative, Emerging and Conversion Technologies



# Emerging and Other Conversion Technologies

- In-Vessel Anaerobic Digestion
  - Autoclaving
  - Gasification
- Plasma Arc Gasification
  - Pyrolysis
  - Hydrolysis
- Mixed Waste Composting



In-furnace conditions

# Conclusions



- Serious movement towards greater Diversion
- Emerging conversion technologies are becoming a more interesting option
- Factual performance, emissions and cost information difficult to obtain
- Pilot and demonstration projects needed

# Conclusions



- At this time, the ability of these emerging technologies to provide a long term commercially viable treatment and disposal option for the City is not proven
  - The likely net cost will be above the \$65 per ton
  - The minimum amount of waste needed would exceed the amount controlled by the City and
  - There remains technical risk.
- When proven feasible, emerging conversion technologies may be an important part of the solution for more sustainable waste management

# Source Separated Organics

- Overview
  - Food and Yard Waste represent ~30% of the Waste Stream
  - Organic Fraction targeted by DEP
- Estimated Quantity Available
  - Within Northampton
    - ❑ Estimated 4.8 Tons per day residential
    - ❑ 8.6 to 9.7 Tons per day commercial/institutional
  - 28 Tons per Day Commercial in the Central Pioneer Valley
- Available Technologies
  - Composting
  - Anaerobic Digestion

# Source Separated Organics

- History of Local SSO Composting Efforts
  - 1996-2000 CET on farm composting program
  - 1991-2004 Smith Vocational Food Waste composting program
- Future SSO Program Considerations
  - Monitor DEP movement on waste ban
  - Examine Separate Collection
  - Examine Developing a City- owned or sponsored facility
  - Identify/Partner with local farms

# Waste Collection and Hauling

- Drop-off Centers
- Subscription Services
- Citywide Curbside Collection Services

# Waste Collection and Hauling

## Drop-off Centers

- Vehicle Stickers Cost (FY09)
  - Residential vehicle sticker - \$25.00 per vehicle
  - Senior vehicle sticker - \$ 5.00 per vehicle
- Bag Stickers Cost (FY09)
  - \$0.25 per 10 gallons
  - \$71 per ton (based on 21 pounds per 30 gallon bag)
- Recyclables Drop-Off is Free
- Delivery Costs Incurred by Users (not include in analysis)
  - Out-of-Pocket (e.g., gasoline, wear and tear)
  - Time

# Waste Collection and Hauling

## Subscription Services - Residential Single-Family\* (\$/month – FY08)

Service	Weekly	Biweekly (every 2 weeks)	Monthly (Vol. Limited)
Trash, Recycling & Yard Waste	<b>\$30-\$34</b>	\$20-\$23	\$12-\$15
Recycling Only	\$24	\$16	\$10
Yard Waste Only	\$22	\$15	na

Service	1-Can	2-Cans	3-Cans	4-Cans
Trash, Recycling & Yard Waste	\$32	<b>\$34</b>	\$35	\$36
Recycling Only	\$13	na	na	na

\* Includes Cost of Disposal



# Waste Collection and Hauling

## Citywide Curbside Collection\*

(\$/Month – FY08)

Community	Units	Trash	Recyclables	Yard Waste	Bulk	Total	\$/Unit/ Month (FY08)
Agawam	8,100	\$504,000	\$288,000	\$77,000	\$84,000	\$953,000	\$9.01
E. Longmeadow	5,000	\$552,000	Included			\$552,000	\$9.21
Longmeadow	5,474	\$553,350	Included			\$553,350	\$8.42
West Springfield	8,553	\$1,000,000	Included			\$1,000,000	\$9.74
Lexington	11,132	\$1,400,000	Included	Included	Included	\$1,400,000	\$10.48
Springfield (FY06)	61,000	\$4,180,520	\$1,274,974	\$817,000	\$825,000	\$7,078,936	\$10.26 (\$9.67)
Average							<b>\$9.52</b>

\* Excludes Cost of Disposal

# Waste Collection and Hauling

## Example Cost Per Household\* (\$/year – FY08)

Service	Tons of Trash/Yr	Drop-Off	Subscription	Curbside
One Senior Person Household – 40 gallons per month (1 to 2 cans per month)	0.169	\$17	\$278	\$127
One Person Household – 60 gallons biweekly (one 30 gallon every other week)	0.320	\$48	\$326	\$138
Two Person Household – 140 gallons per month (one 30 gallon can per week)	.0592	\$67	\$326	\$159
Four Person Household – 80 gallon cans per week (two to three 30 gallon cans per week)	1.465	\$129	\$402	\$224

\* Includes Cost of Disposal

# Alternative Haul, Transfer & Disposal Options

- Current and Planned Disposal Facilities in Region
- Haul Costs to Local Transfer or Disposal Sites
- Transfer and Out-of-State Disposal Costs

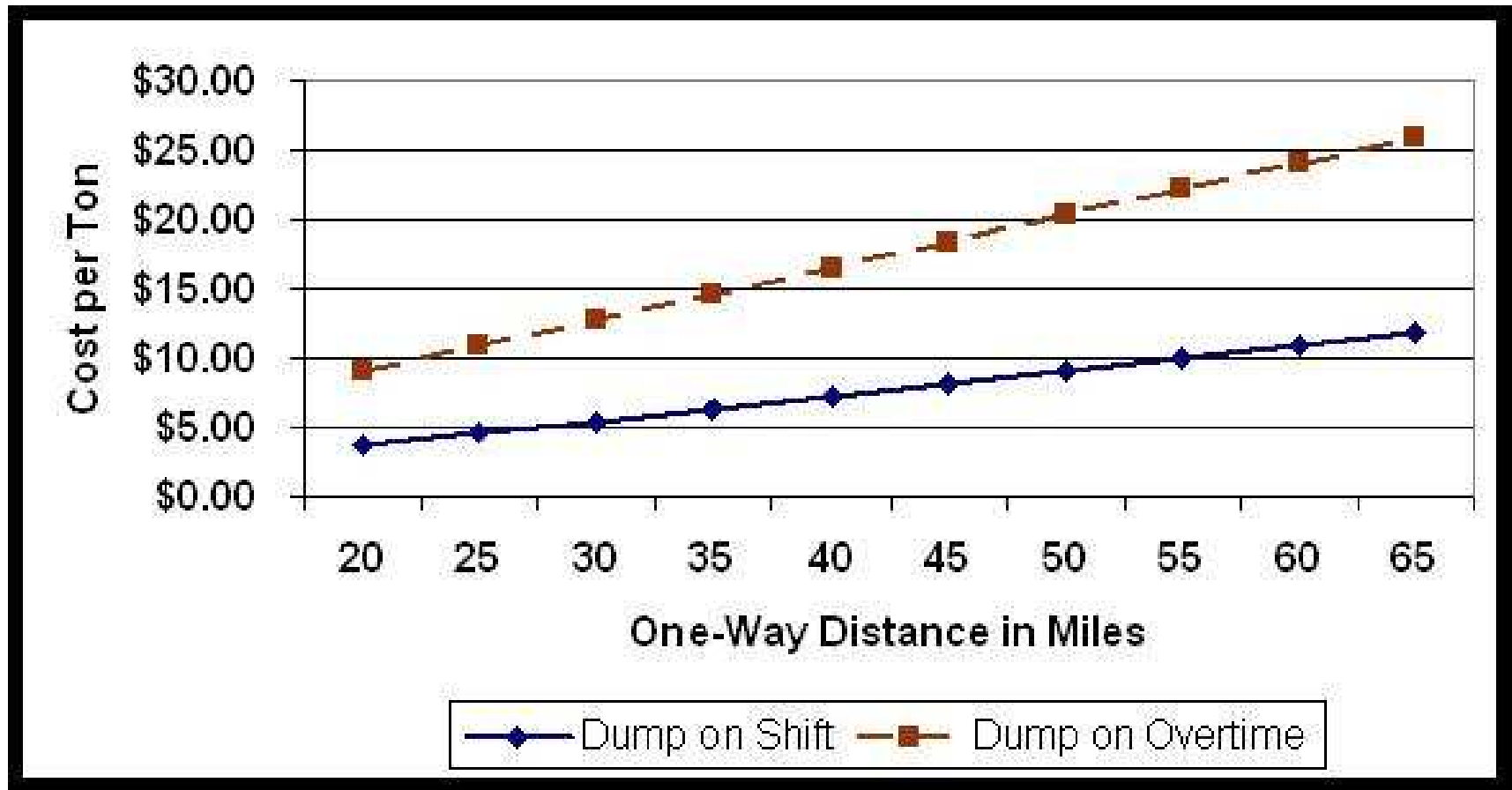
# Haul, Transfer & Disposal Options

## Current and Planned Disposal Facilities in Region

Town	Distance Miles (a)	Permit Tons/Day	Annual Tons	Owner Type	Owner	Scheduled Closing
<b>Landfills</b>						
Northampton	4	275	49,442	Municipal	City of Northampton	12/31/10
South Hadley (b)	12	500	151,715	Municipal	Town of South Hadley	12/31/10
Granby	17	400	119,262	Private	Holyoke Sanitary Landfill Inc. (WMI)	12/31/11
Chicopee	18	1200	187,735	Private	CT Valley Waste Disposal (WMI)	12/31/13
Barre	43	300	37,913	Private	Resource Control Inc. (WMI)	12/31/10
Westminster	62	1425	267,282	Private	WMI (Formally owned by City of Fitchburg)	12/31/17
<b>Waste to Energy</b>						
Agawam	23	408	116,099	Private	Covanta Springfield, LLC	
<b>Total</b>		4,508	929,448			
<b>Transfer Stations</b>						
Northampton	4	250	NA	Private	P. Allen & Sons - closed	
Holyoke	12		NA	Private	Being developed	
West Springfield	18	250		Municipal	Town of West Springfield - closed	
Springfield	20	650		Private	Allied Waste Services of MA, LLC	
Agawam	23	500		Private	Covanta Springfield, LLC	
(a) Approximate one-way distance from Northampton						
(b) South Hadley in process of permitting expansion to extend life to 2013 and plan additional expansion to extend life to 2026.						

# Haul, Transfer & Disposal Options

## Estimated Truck Haul Cost\*



\* Assumes \$3.00/gallon diesel fuel; 6.5 tons/load; 40 mph average speed; one person crew, and straight time hourly wage of \$16.35.

# Haul, Transfer & Disposal Options

## Transfer and Out-of-State Disposal Costs

(FY08)

State	Facility	Hauling Distance (one-way miles)	Total Transfer and Transportation Cost (\$/Ton)	Estimated Range of Tipping Fees (\$/Ton)	Total System Costs (\$/Ton)
<b>New York</b>					
	Seneca Meadows - Seneca Falls	227	\$37.60 - \$39.10	\$28.00 - \$30.00	\$65.60 - \$69.10
	High Acres - Fairport	395	\$59.52 - \$61.02	\$28.00 - \$30.00	\$87.52 - \$91.02
	Ontario County - Stanley	379	\$57.70 - \$59.20	\$28.00 - \$30.00	\$85.70 - \$89.20
	Monroe County - Riga	422	\$62.59 - \$64.09	\$28.00 - \$30.00	\$90.59 - \$94.09
	Hyland - Angelica	397	\$58.70 - \$60.20	\$28.00 - \$30.00	\$86.70 - \$90.20
	Average				<b>\$83.22 - \$86.72</b>
<b>Pennsylvania</b>					
	Alliance Sanitary - Lanckawanna Co.	236	\$43.02 - \$44.52	\$30.00 - \$35.00	\$73.02 - \$79.52
	Grand Central - Pen Argyl	230	\$41.67 - \$43.17	\$30.00 - \$35.00	\$71.67 - \$78.17
	Keystone - Dunmore	229	\$42.36 - \$43.86	\$30.00 - \$35.00	\$72.36 - \$78.86
	GROWS - Morrisville Bucks Co.	229	\$42.14 - \$43.64	\$30.00 - \$35.00	\$72.14 - \$78.64
	BFI Conestoga - Morgantown	294	\$47.63 - \$49.13	\$30.00 - \$35.00	\$77.63 - \$84.13
	Average				<b>\$73.36 - \$79.86</b>

# Assessment of Solid Waste Alternatives

## City Revenues (Expenses) – 3.0% Tip Fee Escalation

Option 1: Current Collection System - Expand Landfill
Option 2: Current Collection System - Close Landfill & Adjacent Drop Off Center
Option 3: Citywide Collection System - Expand Landfill
Option 4: Citywide Collection - Close Landfill & Adjacent Drop Off Center
Option 5: Provide No Services - Close Landfill and All Drop Off Centers

Category	Option 1	Option 2	Option 3	Option 4	Option 5
<b>City Revenues or (Expenses)</b>					
FY12 (\$ per year)	\$737,000	(\$439,000)	\$607,000	(\$481,000)	(\$387,000)
FY25 (\$ per year)	\$2,265,000	(\$645,000)	\$2,075,000	(\$706,000)	(\$568,000)
FY39 (\$ per year)	\$4,298,000	(\$976,000)	\$4,010,000	(\$1,068,000)	(\$859,000)
NPV (\$ millions)	\$25.4	(\$10.0)	\$22.6	(\$10.9)	(\$8.25)

Includes both General and Enterprise Funds

# Assessment of Solid Waste Alternatives

## Household Revenues (Expenses) – 3.0% Tip Fee Escalation

Option 1: Current Collection System - Expand Landfill
Option 2: Current Collection System - Close Landfill & Adjacent Drop Off Center
Option 3: Citywide Collection System - Expand Landfill
Option 4: Citywide Collection - Close Landfill & Adjacent Drop Off Center
Option 5: Provide No Services - Close Landfill and All Drop Off Centers

Category	Option 1	Option 2	Option 3	Option 4	Option 5
<b>Household Revenues or (Expenses)</b>					
FY12 (\$ per year)	(\$2,259,000)	(\$2,363,000)	(\$1,828,000)	(\$1,932,000)	(\$4,027,000)
FY25 (\$ per year)	(\$3,161,000)	(\$3,470,000)	(\$2,684,000)	(\$2,837,000)	(\$5,913,000)
FY39 (\$ per year)	(\$4,781,000)	(\$5,248,000)	(\$4,060,000)	(\$4,291,000)	(\$8,944,000)
NPV (\$ millions)	(\$46.0)	(\$50.4)	(\$39.0)	(\$41.2)	(\$85.9)
<b>Cost per Household</b>					
FY12 (\$ per year)	(\$190)	(\$199)	(\$154)	(\$163)	(\$339)
Subscription Service Users	(\$311)	(\$320)			
Drop Off Center Users	(\$69)	(\$78)			
FY25 (\$ per year)	(\$266)	(\$292)	(\$226)	(\$239)	(\$498)
FY39 (\$ per year)	(\$402)	(\$442)	(\$342)	(\$361)	(\$753)

Household Expenses and Costs per Household are for solid waste collection & disposal



# Assessment of Solid Waste Alternatives

## Total Revenues (Expenses) – 3.0% Tip Fee Escalation

Option 1: Current Collection System - Expand Landfill
Option 2: Current Collection System - Close Landfill & Adjacent Drop Off Center
Option 3: Citywide Collection System - Expand Landfill
Option 4: Citywide Collection - Close Landfill & Adjacent Drop Off Center
Option 5: Provide No Services - Close Landfill and All Drop Off Centers

Category	Option 1	Option 2	Option 3	Option 4	Option 5
<b>Total City and Household Revenues or (Expenses)</b>					
FY12 (\$ per year)	(\$1,522,000)	(\$2,802,000)	(\$1,221,000)	(\$2,413,000)	(\$4,413,000)
FY25 (\$ per year)	(\$896,000)	(\$4,115,000)	(\$609,000)	(\$3,543,000)	(\$6,481,000)
FY39 (\$ per year)	(\$484,000)	(\$6,225,000)	(\$50,000)	(\$5,359,000)	(\$9,803,000)
NPV (\$ millions)	(\$20.7)	(\$60.4)	(\$16.4)	(\$52.1)	(\$94.2)
<b>Cost per Household</b>					
FY12 (\$ per year)	(\$128)	(\$236)	(\$103)	(\$203)	(\$371)
FY25 (\$ per year)	(\$75)	(\$346)	(\$51)	(\$298)	(\$546)
FY39 (\$ per year)	(\$41)	(\$524)	(\$4)	(\$451)	(\$825)

Combined total of household expenses and City revenues (expensed)

# Assessment of Solid Waste Alternatives

## City Revenues (Expenses) – 1.5% Tip Fee Escalation

Option 1: Current Collection System - Expand Landfill
Option 2: Current Collection System - Close Landfill & Adjacent Drop Off Center
Option 3: Citywide Collection System - Expand Landfill
Option 4: Citywide Collection - Close Landfill & Adjacent Drop Off Center
Option 5: Provide No Services - Close Landfill and All Drop Off Centers

Category	Option 1	Option 2	Option 3	Option 4	Option 5
<b>City Revenues or (Expenses)</b>					
FY12 (\$ per year)	\$731,200	(\$456,000)	\$603,100	(\$492,500)	(\$394,200)
FY25 (\$ per year)	\$1,106,400	(\$857,400)	\$927,400	(\$783,400)	(\$616,600)
FY39 (\$ per year)	\$1,027,300	(\$1,581,100)	\$765,900	(\$1,285,600)	(\$998,100)
NPV (\$ millions)	\$10.3	(\$14.8)	\$7.3	(\$13.7)	(\$10.2)

Includes both General and Enterprise Funds

# Assessment of Solid Waste Alternatives

## Household Revenues (Expenses) – 1.5% Tip Fee Escalation

Option 1: Current Collection System - Expand Landfill
Option 2: Current Collection System - Close Landfill & Adjacent Drop Off Center
Option 3: Citywide Collection System - Expand Landfill
Option 4: Citywide Collection - Close Landfill & Adjacent Drop Off Center
Option 5: Provide No Services - Close Landfill and All Drop Off Centers

Category		Option 1	Option 2	Option 3	Option 4	Option 5
<b>Household Revenues or (Expenses)</b>						
	FY12 (\$ per year)	(\$2,276,600)	(\$2,381,800)	(\$1,845,000)	(\$1,950,200)	(\$4,065,800)
	FY25 (\$ per year)	(\$3,222,300)	(\$3,580,900)	(\$2,762,500)	(\$2,927,100)	(\$6,358,700)
	FY39 (\$ per year)	(\$5,022,700)	(\$5,603,100)	(\$4,306,900)	(\$4,573,300)	(\$10,292,800)
	NPV (\$ millions)	(\$53.2)	(\$59.0)	(\$45.5)	(\$48.3)	(\$105)
<b>Cost per Household</b>						
	FY12 (\$ per year)	(\$192)	(\$200)	(\$155)	(\$164)	(\$342)
	Subscription Service Users	(\$311)	(\$320)			
	Drop Off Center Users	(\$69)	(\$78)			
	FY25 (\$ per year)	(\$271)	(\$301)	(\$233)	(\$246)	(\$535)
	FY39 (\$ per year)	(\$423)	(\$472)	(\$363)	(\$385)	(\$866)

Household Expenses and Costs per Household are for solid waste collection & disposal

# Assessment of Solid Waste Alternatives

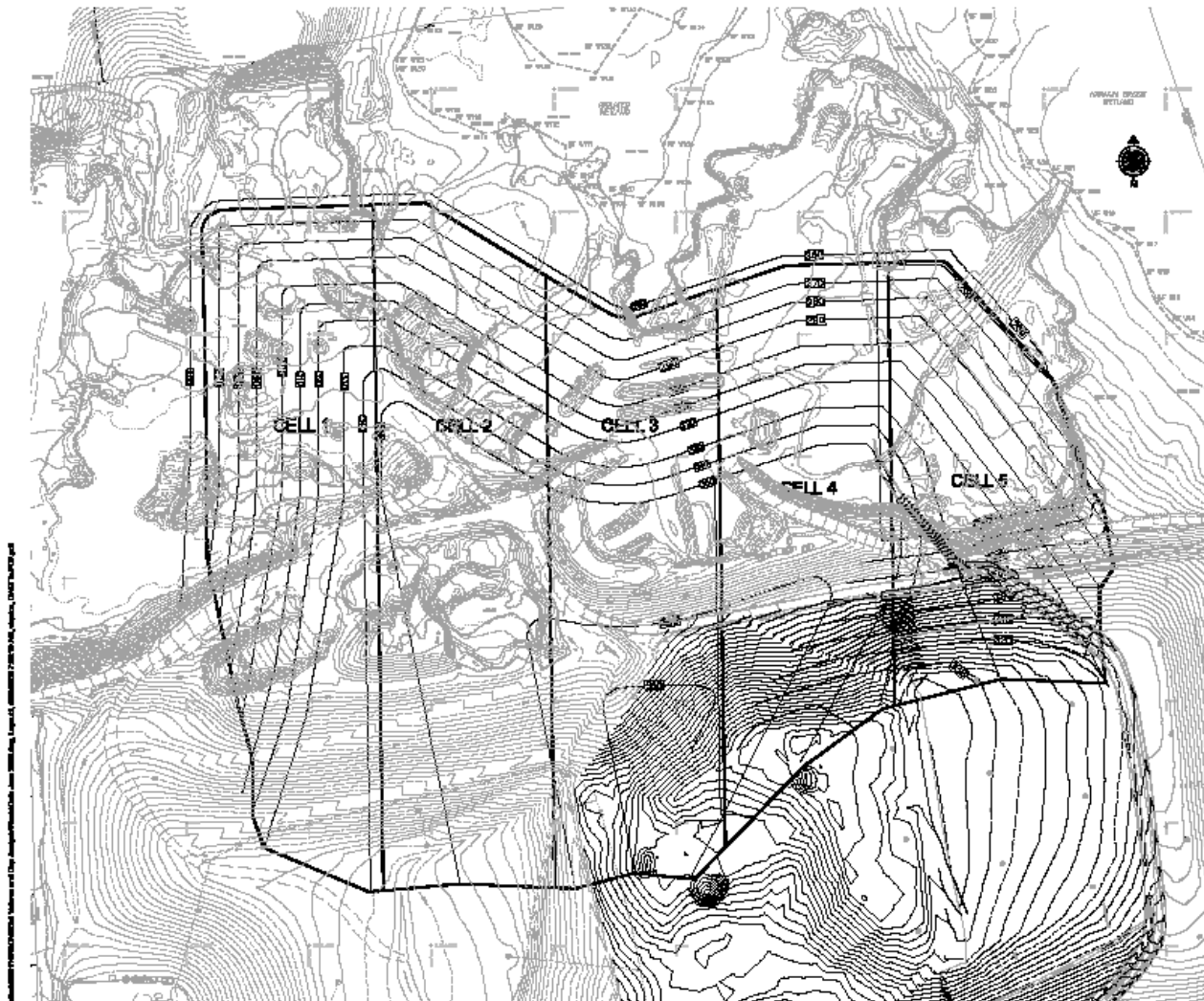
## Total Revenues (Expenses) – 1.5% Tip Fee Escalation

Option 1: Current Collection System - Expand Landfill
Option 2: Current Collection System - Close Landfill & Adjacent Drop Off Center
Option 3: Citywide Collection System - Expand Landfill
Option 4: Citywide Collection - Close Landfill & Adjacent Drop Off Center
Option 5: Provide No Services - Close Landfill and All Drop Off Centers

Category	Option 1	Option 2	Option 3	Option 4	Option 5
<b>Total City and Household Revenues or (Expenses)</b>					
FY12 (\$ per year)	(\$1,545,400)	(\$2,837,800)	(\$1,241,900)	(\$2,442,800)	(\$4,460,000)
FY25 (\$ per year)	(\$2,115,900)	(\$4,438,200)	(\$1,835,200)	(\$3,710,500)	(\$6,975,300)
FY39 (\$ per year)	(\$3,995,500)	(\$7,184,200)	(\$3,541,000)	(\$5,858,900)	(\$11,290,900)
NPV (\$ millions)	(\$43.0)	(\$73.8)	(\$38.2)	(\$61.9)	(\$114.8)
<b>Cost per Household</b>					
FY12 (\$ per year)	(\$130)	(\$239)	(\$105)	(\$206)	(\$375)
FY25 (\$ per year)	(\$178)	(\$374)	(\$154)	(\$312)	(\$587)
FY39 (\$ per year)	(\$336)	(\$605)	(\$298)	(\$493)	(\$950)

Combined total of household expenses and City revenues (expensed)

# Phase 5 LF Expansion Sensitivity Analysis



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**Client:**

**Project:**

**Scale:** \_\_\_\_\_ **By:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Revised:** \_\_\_\_\_ **By:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**City:** \_\_\_\_\_ **State:** \_\_\_\_\_ **Year:** \_\_\_\_\_

**Project No.:** \_\_\_\_\_ **Sheet No.:** \_\_\_\_\_

**Client/Project:**  
 CITY OF NORTHAMPTON  
 DEPARTMENT OF PUBLIC WORKS  
 NORTHAMPTON LANDFILL  
 PHASE 5 EXPANSION  
 Northampton, Massachusetts

**Title:**  
 Conceptual Grading Plan  
 Figure 7-1

**Project No.:** 00111870 **Scale:** AS NOTED

**Drawing No.:** \_\_\_\_\_ **Sheet:** \_\_\_\_\_ **Revised:** \_\_\_\_\_

1 of 1

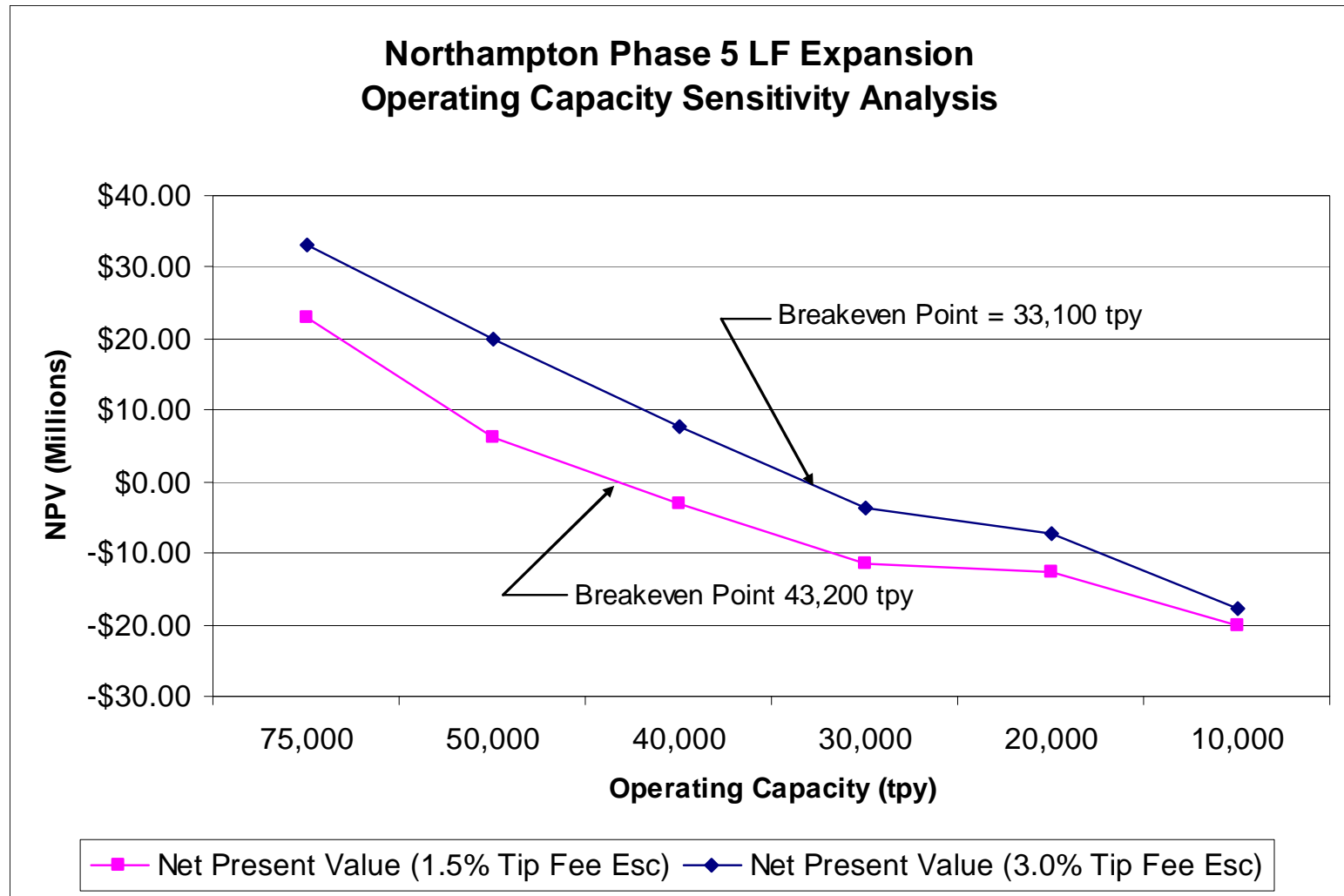
# Phase 5 LF Expansion Sensitivity Analysis

- Financial Feasibility of LF Expansion
- Expansion Capacity = 1.41 million tons (28 years @ 50k/yr)
- Costs and Revenues Sensitive to Operating Capacity
- Cost Factors:
  - Site infrastructure, roads, scale, stormwater and related facilities
  - Liner Construction
  - Leachate and Landfill Gas Systems Construction
  - Permitting and Engineering
  - Construction Management and Quality Control
  - Operations and Maintenance
  - Closure and Capping
  - Post-closure Maintenance

# Phase 5 LF Expansion Sensitivity Analysis

- Revenue Factors:
  - Waste Disposal Tip Fees
  - Alternative Daily Cover Revenue
  - Gas Sales to Landfill Gas to Energy Facility
  - Closure Fund Interest Income
  - Cell Tower Lease Payments
- Tip Fee Escalation:
  - Sensitivity Modeled at 1.5% and 3.0%
  - Average Historical Northampton LF Escalation = 2.0% per year

# Phase 5 LF Expansion Sensitivity Analysis



Note: Breakeven points based on total NPV of 28 year cash flow balancing costs and revenues.



# Phase 5 LF Expansion Sensitivity Analysis

Northampton Regional Sanitary Landfill - Phase 5 Expansion						
Phase 5 Expansion Financial Feasibility						
	No Host Comm Fee		Host Comm Fee (\$500k)		Host Comm Fee (\$500k esc)	
Operating Capacity	Feasible	NPV (\$Mil)	Feasible	NPV (\$Mil)	Feasible	NPV (\$Mil)
Tip Fee Esc						
30,000 tpy						
1.5%	N	(\$11.57)	N	(\$19.27)	N	(\$22.53)
2.0%	N	(\$9.11)	N	(\$16.81)	N	(\$20.06)
3.0%	N	(\$3.53)	N	(\$11.24)	N	(\$14.49)
40,000 tpy						
1.5%	N	(\$2.99)	N	(\$10.69)	N	(\$13.95)
2.0%	N	\$0.31	N	(\$7.39)	N	(\$10.64)
3.0%	N	\$7.78	N	\$0.08	N	(\$3.18)
50,000 tpy						
1.5%	Y	\$6.32	N	(\$1.38)	N	(\$4.64)
2.0%	Y	\$10.46	N	\$2.75	N	(\$0.50)
3.0%	Y	\$19.82	Y	\$12.11	Y	\$8.86
75,000 tpy						
1.5%	Y	\$23.00	Y	\$16.93	Y	\$15.25
2.0%	Y	\$26.20	Y	\$20.13	Y	\$18.45
3.0%	Y	\$33.14	Y	\$27.07	Y	\$25.39

Note: Financial feasibility is defined as having a positive free cash carry-over at the end of every operating year.

# Phase 5 LF Expansion Sensitivity Analysis

Northampton Regional Sanitary Landfill			
Phase 5 Expansion Financial Feasibility Breakeven Tonnages			
Tip Fee Escalation	No Host Comm. Fee	Host Comm. Fee (\$500k)	Host Comm. Fee (\$500k esc.)
1.5% per Yr.	42,800	51,200	52,300
2.0% per Yr.	41,900	50,700	51,000
3.0% per Yr.	40,350	46,400	46,700

Note: Financial feasibility is defined as having a positive free cash carry-over at the end of every operating year.

# Appraisal Value of Phase 5 Landfill

- Landfill Expansion Site on 50 Acre Parcel
- Permitted LF Expansion “Air Rights”
- Privatized D/B/O Option
- Private Company Assumes Responsibilities and Risks:
  - Construction
  - Operation
  - Closure
  - Post-closure
- City Retains Land Ownership
- Financial Assumptions for “Air Rights” Sale
  - Starting Tip Fee (2012): \$75/ton and \$80/ton
  - Tip Fee Escalation: 1.5% per year
  - Private Contractor Profit Margin: 15%
  - Performance Surety Bond of \$4.5 million

# Appraisal Value of Phase 5 Landfill

- Calculation of Air Rights Market Value:

Per Ton Market Price x LF Capacity = Gross Revenue

Minus Private Sector D/B/O and Close Costs = Gross Profit

Minus Private Sector Rate of Return Target = Net Profit Margin

Air Rights Market Value = NPV of 28 Yr. Net Profit Margin

# Appraisal Value of Phase 5 Landfill

Table 9-2

Preliminary Assessment of Sale of Phase 5 Air Rights

Scenario	Contractor Net Costs (NPV considering Costs and Revenue Share) (\$Mil)	NPV, Value of Phase 5 Expansion Paid to City (\$Mil)	City Net Costs (NPV considering City Costs and Potential Annual Payment) (\$Mil)
50,000 tpy, Contractor 15% rate of return, Tip Fee \$75/ton	Contractor Cost (\$53) Contractor Revenue \$64 Contractor Net \$11.5	\$ 7.8 over 28 years \$0.28 annually	City Cost (\$0.15) Incremental Benefit \$7.6 over planning period
50,000 tpy, Contractor 15% rate of return, Tip Fee \$80/ton	Contractor Cost (\$53) Contractor Revenue \$61.7 Contractor Net \$8.7	\$ 12.3 over 28 years \$0.44 annually	City Cost (\$0.15) Incremental Benefit \$12.2 over planning period.

# Appraisal Value of Phase 5 Landfill

- Benefits of D/B/O Option:
  - Shifting Financial Responsibility to Private Company
  - Eliminates Solid Waste Market Risk
    - ❑ Future tip fees
    - ❑ Variations in waste tonnage
  - Annual Host Community Benefits

# Appraisal Value of Phase 5 Landfill

- Non-Monetary Issues of LF Sale:
  - Liability and risk allocation
  - Environmental quality characteristics of existing LF
  - Loss of City staff positions
  - Oversight of privatized activities

# Wrap-Up

- Next Steps
- Follow-up Public Meeting
- Availability of Powerpoint Presentation
- Availability of Public Presentation Video